



SEP 09 2013

13-HAB-0032

Mr. S. E. Hudson, Chair  
Hanford Advisory Board  
Enviroissues Hanford Project Office  
713 Jadwin, Suite 4  
Richland, Washington 99352

Dear Mr. Hudson:

HANFORD ADVISORY BOARD (HAB) JUNE 7, 2013, CONSENSUS ADVICE #268,  
"100-F AREA REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RIFS) AND  
PROPOSED PLAN (DRAFT A)"

Thank you for advice #268 (enclosed) on the 100-F Area RIFS and Proposed Plan (Draft A). The U.S. Department of Energy (DOE) and U.S Environmental Protection Agency (EPA) appreciate the HAB's early input on the above referenced document and its continued interest in the cleanup work at Hanford. The HAB's comments and advice will be considered as we continue to work to a final version of the document.

Below are the responses to the points in your advice:

**Advice Point #1:** The Board advises that DOE identify Groundwater Alternative GW-4 as the preferred alternative that as pointed out in the Balancing Criteria discussion in the Proposed Plan, "provides the highest reduction of toxicity, mobility or volume through treatment." More importantly, (also in the Balancing Criteria) the GW-4 alternative was deemed better due to the fact that "Groundwater extraction and injection wells are also used to contain the Contaminants of Concern plumes, preventing their migration into other uncontaminated areas (like the Columbia River)." Clearly this alternative addresses both the northern and southern parts of the plume, and provides the most protectiveness of any of the alternatives.

**Response:** The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires the evaluation and comparison of all five balancing criteria. When evaluating all of the balancing criteria, the proposed Alternative (GW-2) is similar to GW-4 in long-term effectiveness and permanence and short-term effectiveness. Alternative GW-2 has a higher implementability rating and a significantly lower cost. However, based on your comment, we will continue to evaluate all the alternatives.

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**Advice Point #2:** The Board advises that the Tri-Party Agreement (TPA) agencies choose Alternative GW-4 instead of the current preferred Alternative GW-2, which only includes the use of institutional controls (IC) and MNA for remediation of the site. There is no reasonable way to ensure that ICs will effectively protect human health for the projected 175 years that the Proposed Plan projects will be required for natural attenuation of the 16 waste sites with deep vadose zone contamination (Table 2). These 16 sites contain vadose zone cesium-137, cobalt-60, europium-152 and -154, nickel-63 and strontium-90 contamination at levels considered dangerous to human health. If the MNA alternative were to be selected, the worst offender of these sites (118-F-8:3, with 175 years to reach cleanup levels under MNA) should be considered for removal, treatment and disposal to reduce the overall projected time needed for protective ICs. The remaining sites require less time to decay to acceptable levels (13 to 75 years) and here ICs could be considered protective over this more reasonable monitoring period.

**Response:** As a point of clarification, the sites referred to in this advice point have soil contamination deeper than 15 feet below the ground surface and it is determined that contamination this deep does not result in an exposure pathway for humans through direct contact with the soil. Additionally, the contamination at these sites does not exceed soil groundwater protection preliminary remediation goals, meaning they are not expected to adversely affect groundwater. Based on this information, the sites do not pose an unacceptable risk to human health or the environment. Institutional controls will be used to control drilling and excavation activities that would disturb the soil at these waste sites and prevent potential human exposure to contamination.

**Advice Point #3:** The Board advises that a more proactive solution, like a permeable reactive barrier, is required to prevent the 100-F strontium-90 groundwater plume from entering the Columbia River. Samples from several aquifer tubes immediately adjacent to the Columbia River have detected rising strontium-90 levels. The preferred alternative's 150 years of MNA is not a reasonable timeframe for remediation of the strontium-90 plume. Allowing strontium-90 to decay is inappropriate when tested technology is available to address the plume. This strontium-90 groundwater plume should be addressed with the tested and apparently successful apatite Permeable Reactive Barrier like that used at 100-N.

**Response:** As a point of clarification, strontium-90 concentrations have only exceeded the 8pCi/L DWS in one aquifer tube sample from Fall 2012 at a value of  $9.6 \pm 2.55$  pCi/L. This tube is 14.5 feet deep and does not monitor the groundwater/surface water interface, where groundwater upwelling occurs. There is no clear indication of increasing strontium-90 trends in 100-F aquifer tubes; in most tubes concentrations are near or below detection limits. Based on this information, the monitored natural attenuation (MNA) appears to be an appropriate remedial alternative.

The current understanding of the strontium-90 contamination is that it is bound to the soil in a localized area and is not migrating. Although use of a reactive barrier may further bind the strontium-90 in the soil, it will not reduce the 150-year timeframe necessary for its decay. Decay would remain as the primary natural attenuation mechanism.

**Advice Point #4:** The Board advises the TPA agencies to base cleanup decisions/actions on the goal of restoring Hanford groundwater to its highest beneficial use (per the Model Toxics Control Act [MTCA]) to protect human health, the environment, and the Columbia River as stated in MTCA regulations (see the Proposed Plan, page 24 and reference to the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA]; and the National Oil and Hazardous Substances Pollution Contingency Plan [NCP, 40 CFR 300]).

**Response:** DOE and EPA share the goal of restoring groundwater to its highest beneficial use. The proposed preferred alternative achieves this goal. The recommended Preferred Alternative will remove contamination through attenuation and will achieve the remedial action objective of preventing unacceptable risk to human health and ecological receptors from exposure to surface water containing contaminant concentrations above federal and state standards and risk based thresholds. This alternative is expected to restore groundwater to drinking water standards and protect aquatic life in the Columbia River by achieving ambient water quality criteria (AWQC) and state water quality standards at the groundwater/surface water interface.

**Advice Point #5:** The Board advises the TPA agencies to choose alternatives that meet the goal of unrestricted use along the River Corridor. Language in the Proposed Plan and selected preferred alternatives indicates that DOE is not considering cleanup to unrestricted use standard and is moving toward a less stringent cleanup based on the Comprehensive Land-Use Plan. The Board believes it is misleading to the public for the Proposed Plan to state “Where the toxicity and mobility of source material combine to pose a potential human health excess lifetime cancer risk (ELCR) greater than one in a thousand ( $1 \times 10^{-3}$ ), treatment alternatives should be identified (A guide to Principal Threat and Low Level Threat Wastes [EPA 1991]).” The point of departure for CERCLA remediation is stated as  $1 \times 10^{-6}$  and the Board believes that every effort should be made to meet this standard (EPA 1997). The cleanup exposure scenario needs to be protective of children, including Native Americans exercising their treaty rights to “live along and fish” the Hanford Reach. MTCA requires use of permanent remedies when practicable and cleanup of carcinogens to meet a risk level of  $1 \times 10^{-5}$  for carcinogens.

**Response:** As a point of clarification, the Tri-Party Agencies are using cleanup levels based on a residential scenario. A residential scenario under CERCLA determines cleanup levels based on a risk range from  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ . The Model Toxics Control Act was also used to determine cleanup levels for chemical contaminants of concern based on a risk level of  $1 \times 10^{-5}$  for carcinogens.

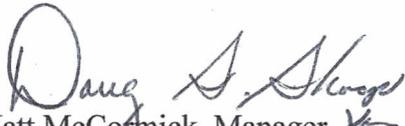
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The reference to Principal Threat Waste (excess lifetime cancer risk of  $1 \times 10^{-3}$ ) will be removed from the final Proposed Plan since there are no sites remaining in F Area or IU-2/6 that constitute Principal Threat Waste.

Thank you again for your advice on this subject. If you have any questions, you may contact Kim Ballinger, DOE, at (509) 376-6332 or Chris Guzzetti, EPA, at (509) 376-9529.



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OCE:KSB

Enclosure

cc w/encl: See page 5

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