



Oregon

Kate Brown, Governor



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U.S. Department of Energy
Attn: Jennifer Colborn
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Dear Ms. Colborn,

We appreciate the opportunity to provide comments on the interim disposition of three critically important waste sites within the Plutonium Finishing Plant complex – the Z-9 trench, Z-2 crib, and the Z-361 process storage tank (1). Since these structures are degrading, but are not expected to be remediated until the 2030s, DOE is proposing interim actions for stabilization with the intent to protect workers and the environment for the next decade or two.

We are concerned that documentation provided by the U.S. Department of Energy to support this proposed action fails to consider reasonable alternatives beyond grouting, and does not fully consider what implications these interim, non-final actions might have to final remediation cost; the condition of the contaminants within the stabilized structure; and precedents set for underground waste storage tanks at Hanford. While interim stabilization with engineered grout seems an optimal way to reduce the risk to human health and the environment, a site-by-site evaluation of how this action will affect the total estimated cost of eventual site closure is needed.

Site-wide structural and risk evaluations were undertaken in response to the partial collapse of PUREX Tunnel 1 in 2017. There were three October 2019 reports related to this proposed action, including a Recommendation and Summary Report (2). While interim stabilization was listed as the first recommended step for each of the waste sites, an alternative approach was also presented - that of designing and installing a surface cover to prevent the release of contaminants to the surface in the event of a catastrophic failure.

If grouting of these PFP waste sites pushes final remediation costs into the realm of economic impracticality, then alternate risk mitigation (e.g., surface cover with HEPA filters) should be considered.

Liquid Waste Disposal Units

Oregon agrees that the Interim stabilization of both liquid waste disposal units (the Z-9 trench and Z-2 crib) with engineered grout will effectively reduce the risk of contaminant spread in the event that the roofs of these structures were to collapse. The Z-2 crib seems the most likely candidate for grouting as

the void space is manageable, the contamination is not excessive, and its sister crib (216-Z-1) has already failed (2).

As far as the Z-9 trench, if grouting does move forward, we encourage DOE to take special consideration of the waste site chemistry and how contaminants will react when a wet, basic carbonate is added to the system. During mining, drummed soils from the Z-9 trench had to be vented before burial in 218-W-4c since they released carbon dioxide (thought to be a reaction with cement), and generated hydrogen when wet (3). It is uncertain whether a similar hydrogen buildup could occur if the remaining contaminated soils are encased by cementitious materials, and whether such accumulation would be enough to pose a potential hazard. It is also difficult to predict what effect adding grout will have on the mobility of complex plutonium wastes. Reactions should be anticipated and monitored during and after grout installation.

One benefit of an engineered grout approach would be a stable work surface and shielding for workers and heavy equipment when these sites are eventually excavated, which would likely improve the safety and efficiency of the final action (4). A similar strategy was employed for the demolition of the 100-K East fuel storage basin. Once the grout has cured, we see an opportunity to use the stable and secure surface to support a drill rig and install borings through the center of the waste structures. These can be used to refine the remedial strategy via additional characterization, optimize soil vapor extraction, and monitor the chemical reactions of the contaminated soil with the grout.

Z-361 Settling Tank

Oregon does not support the near-term actions proposed in the Time Critical Removal Action for the Z-361 tank. We are concerned that having a grout plug (5) resting on top of sludge which potentially has semi-liquid properties may greatly complicate future retrieval activities. We are also concerned about the precedent of filling a tank that contains significant quantities of sludge with grout before any attempt is made to remove the sludge.

The procedure for closing underground reprocessing waste storage tanks at Hanford is well established: empty the tank, then stabilize and close. We see no reason to treat this tank, which also contains reprocessing waste, any differently. DOE has demonstrated repeatedly that radioactive sludge is retrievable from underground storage tanks.

While analysis shows that the structural integrity of the tank may be in doubt, the failure of this tank would likely occur along the bottom of the long sidewalls due to external soil pressure. Catastrophic collapse of the roof is considered unlikely. In addition, there does not appear to be much risk of airborne dispersion due to the physical nature of the sludge.

The Recommendation and Summary Report (2), offered an alternative way to mitigate the risk of structural failure for this tank without grout. It proposed to cover the tank with a tent temporarily while the evaluation was conducted. The tank has a small footprint and been covered historically to allow sampling and repair. Alternatively, DOE could dig a trench or install sheeting around the tank to relieve the soil pressure and allow the sludge to be removed. This would reduce both the likelihood of structural failure and the consequence of failure, at a potentially reduced cost, without complicating future tank waste retrieval through a hardened mass of grout. We would like to understand, via a

technical and economic evaluation, why these recommendations are rejected in favor of the proposed action.

Analysis of Alternatives

The extended public comment window due to a global pandemic is a reasonable action to ensure that the public can be informed and involved. However, for future uses of this process, we encourage DOE to reduce the amount of time it takes for time critical reports to be placed on the Administrative Record. The structural analysis reports for these waste sites were completed in October of 2019 (2), but not placed on the Administrative Record until a little more than a month before the public comment period opened. This public dialogue could have occurred before the contract went to bid, and the “time critical” nature of the actions would be reinforced. Additionally, we note that despite the assertion of time criticality, the delay between completion of the summary and recommendations report and this Action Memo suggest that DOE could have pursued a non-time critical removal action with the associated analysis. We observe that such a path would allow the Tri-Parties to understand in greater detail the potential effects these interim actions would have on the chosen final remedies for these sites, and it would have allowed the evaluation of alternative interim measures.

Proactively mitigating risk in a reversible and responsible fashion is in the best interest of all stakeholders at Hanford. However, we do not think that one solution fits all problems. Grout is one tool at DOE’s disposal, and it should only be used after a site-specific analysis is completed. The lifecycle costs, alternatives evaluated, and rationale for the preferred alternative should be presented for public review and comment prior to announcing an interim measure.

If you have any questions or wish to discuss any of our comments, please contact Tom Sicilia of my staff at 503-378-5584.

Sincerely,



Ken Niles
Assistant Director for Nuclear Safety

CC: Alex Smith, Washington Department of Ecology
Dave Einan, U.S. Environmental Protection Agency
Matt Johnson, Confederated Tribes of the Umatilla Indian Reservation
Laurene Contreras, Yakama Nation
Jack Bell, Nez Perce Tribes
Oregon Hanford Cleanup Board
Hanford Advisory Board

Table 1: Waste Site Summaries

<u>Waste Site</u>	<u>Group</u>	<u>Dimensions</u>	<u>Contaminants</u>	<u>ROD (4) Disposition</u>	<u>Release to the Environment</u>
216-Z-9	Liquid Waste Disposal	21-foot-deep void covered by a 90 feet by 120 feet concrete roof supported by six concrete columns. The site is shaped like an inverted pyramid, with a bottom of 60 feet by 30 feet	Contained an estimated 100-300 pounds of plutonium.* Carbon tetrachloride also present at non-aqueous phase liquid) concentrations *Soils were mined in the 1970s, removing 128 lbs of plutonium. Contaminated soil was placed in more than 600 55-gallon drums, which were retrievably stored in low level burial ground 218-W-4c. The drums were vented due to soil chemical reactions leading to hydrogen and carbon dioxide generation (2)	Excavation of structure and at least 2 feet of soil from the bottom. Soil vapor extraction for solvents, evapotranspiration barrier once work is completed.	Yes
216-Z-2	Liquid Waste Disposal	Wooden 14 by 14 crib, with 14 feet of void space. Covered by 7 feet of soil	Nitrate and approximately 15 pounds of Plutonium	Remove Crib and four feet of soil, to depth of 25 feet.	Yes
241-Z-361	Underground Process storage tank	Steel lined, concrete tank 28 feet by 15 feet, 19 feet tall, and buried 2 feet underground Filled with 8 feet of sludge, leaving 11 feet of void space	64 pounds of Plutonium, metals, PCBs	Remove Sludge, fill tank with flowable fill, close in place. * *-modified to remove tank (6)	No* *Liner corroded, but tank not thought to have leaked based on sludge level consistency

References:

- 1- *Action Memorandum for the Interim Stabilization of 216-Z-2 Crib, 216Z9 Trench, and 241Z361 Settling Tank Draft A*, US DOE, March 16, 2020, Doc ID 20-AMRP-0021
- 2- *Recommendation and Summary Report*, CHPRC, October 21, 2019, Doc ID CP-64221
- 3- *Report on Plutonium Mining Activities at 216-Z-9 Enclosed Trench*, Rockwell International, September 1, 1978, Doc ID RHO-ST-21
- 4- *Record of Decision Hanford 200 Area Superfund Site 200-CW-5 and 200-PW-1 200-PW-3 and 200-PW-6 Operable Units*, US DOE, September 30, 2011, AR Ascension 0093644
- 5- *Statement of Work for Construction*, CHPRC, January 2020, AR Ascension AR-03559
- 6- *Interim Stabilization of Waste Sites 216-Z-2 Crib, 216-Z-9 Trench, and 241-Z-361 Settling Tank*, US DOE, February 18, 2020, Doc ID 20-AMRP-0006