



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation, Oak Ridge Office
761 Emory Valley Road
Oak Ridge, Tennessee 37830

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COUNTY MAYOR'S OFFICE

February 9, 2024

Mr. Roger Petrie
Oak Ridge Office of Environmental Management
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Petrie

RE: Transmittal of the Waste Handling Plan for the Demolition of the Alpha-2 Complex Located at the Y-12 National Security Complex, Oak Ridge, Tennessee (DOE/OR/01-2877&D1)

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation-Oak Ridge Office, received the above referenced submittal on November 14, 2023. The document has been reviewed pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation.

The FFA describes that more than 95,000 pounds of mercury were lost from the Alpha-2 processes during active operations. Characterization to support the currently proposed Decontamination and Demolition (D&D) scope shows little mercury in the above-grade portions of the facility. The FFA parties have discussed and are assuming most of the missing mercury was lost within the basement of the facility. As discussed in the existing Upper East Fork Poplar Creek (UEFPC) Phase I Interim Record of Decision (ROD), due to the toxicity and mobility of the mercury contamination, the soils in the Alpha-2 basement are considered *principal threat waste* which will require treatment as the U.S. Department of Energy (DOE) implements remediation under the Interim RODs in the UEFPC watershed. TDEC also understands that a significant portion of the basement has an earthen floor with an operational sump which currently suppresses groundwater under the facility to minimize shallow groundwater interaction with the mercury-contaminated soils.

Over the past year, the FFA parties have discussed filling the Alpha-2 basement with controlled low-strength material (CLSM) to stabilize the first floor allowing for safer demolition. That activity also includes turning off the basement sump until a future decision is made to re-establish groundwater suppression underneath Alpha-2. Future plans for the sump are discussed in the 2023 Non-Significant Change (NSC) to the UEFPC Phase I Interim ROD which describes that the sump would no longer be needed to dewater the basement when the void

spaces in the basement are filled with CLSM (i.e., no water should accumulate to require pumping).

Specifically, TDEC is concerned that over ~40 tons of mercury suspected to be in the basement soils under Alpha-2 will become a saturated source for the release of contamination when the groundwater is no longer suppressed by the active sump. Potential problems caused by the groundwater interaction with this principal threat waste has been documented in past FFA decision documents. The historic path forward has been to maintain this sump, minimizing the groundwater contacting the mercury-contaminated soils, and treating the water before discharge to a receiving stream.

In addition, access to ultimately treat those contaminated soils will be hindered by covering the soils with several feet of CLSM. Furthermore, the UEFPC Phase II Interim ROD discusses FFA party agreement to not pursue remediation of contaminated soils beneath the water table. If cessation of the basement sump allows the mercury soils under Alpha-2 to become saturated with groundwater, would it be DOE's interpretation that those soils no longer require remediation?

TDEC requests the parties continue discussions regarding this work scope and commit to a more clear and coherent strategy to address the significant source of mercury contamination in the basement of Alpha-2. Such a commitment should include establishing plans and milestone(s) for future measures to minimize expected impacts to groundwater and surface water. Developing the sequence of work and committing to future remedial actions to address the Alpha-2 basement soils are instrumental for addressing principal threat wastes, coordinating with National Nuclear Security Administration (NNSA) regarding plans for future land use, and minimizing impacts to Y-12's modernization program.

The following comments are relevant to TDEC's review.

General Comment

As discussed in TDEC's comment letter on the Addendum to the Removal Action Work Plan for the Y-12 Facilities Deactivation/Demolition Project (DOE/OR/01-2479&D1/A13/R2), a mercury-management plan should be developed and provided to the FFA parties that identifies the specific protocols and plans that will be followed to ensure mercury-contaminated hazardous waste is identified and managed appropriately. The specific protocols and plans should discuss how/when inspections will be conducted, how debris piles will be managed if visible mercury is identified, and any other special waste handling requirements associated with the presence of visible mercury.

Specific Comments

1. **Page 4, Section 2.1, 6th bullet** – Revise the bullet to state “Shutting off the sump in the basement of Bldg. 9201-2 and complying with the terms of the NSC to the Upper East Fork

Poplar Creek Phase I Interim ROD approved by the FFA parties in May 2023 to allow temporary filling of the sump basins in the basement and cessation of treatment of contaminated groundwater no longer being collected during demolition with monitoring and potential contingency action."

2. **Page 4, Section 2.1, 7th bullet** – Characterization of the basement floor and walls is designated as "screened via radiological survey and visual inspection". TDEC expects a more robust characterization effort of the mercury-contaminated basement than these two methods alone. In addition, please add a statement that a Data Quality Assessment for the basement will be conducted and provided to TDEC before CLSM placement begins.
3. **Page 4, Section 2.1, 7th bullet** – Please elaborate on the basement end-state after it has been filled with CLSM. Will it be completely filled? What will the accessibility be after placement of the CLSM?
4. **Page 4, Section 2.1, 9th bullet** – Although remediation of basement soils is not directly addressed as part of the Waste Handling Plan, actions taken to complete demolition of Alpha-2, such as cessation of the basement sump and filling of the basement with CLSM, have a direct impact on future remedial actions in the basement as well as decisions/commitments already made in the UEFPC Phase I and Phase II Interim RODs.
 - The UEFPC Phase I Interim ROD (DOE/OR/01-1951&D3) identified source areas associated with the Alpha-2 building that act as reservoirs for the continuing release and migration of mercury contamination into shallow groundwater and surface water. These source areas included soil beneath and adjacent to the building which, because of the toxicity and mobility of the mercury contamination, are identified in this Interim ROD as principal threat wastes.
 - The UEFPC Phase II Interim ROD (DOE/OR/01-2229&D3) specifies mercury-contaminated soil beneath and adjacent to the Alpha-2 building as one of the source areas addressed under this Interim ROD. Specifically, the Interim ROD estimated approximately 150 cubic yards of accessible soil in the basement that would require excavation.

Given that Appendix D of the FFA (Stipulated Facts) acknowledges that approximately 95,000 pounds of mercury were lost to the ground from the Alpha-2 building, DOE should strongly consider addressing these soils prior to turning off the sump, saturating them, and covering them when the basement is filled with CLSM. Otherwise, this bullet should be revised to include a strong commitment to remove/remediate mercury-contaminated soils considered principal threat waste in accordance with the National Contingency Plan [40 CFR 300.430(a)(1)(iii)(A)] following demolition of the facility.

5. **Page 5, Section 2.2, 2nd sentence** – Please add a contingency note that waste from Bldg. 9732-2 demolition may go to the EMWMF if it is not able to be appropriately segregated during the demolition process. The 9501-2 facility should also be included in the statement.

6. **Page 9, Section 3.2, 1st paragraph, 3rd sentence** – TDEC was under the impression that the height range of the basement was less than described here, which is why the removal of some piping was impossible due to safety concerns. Please elaborate.
7. **Page 12, Section 4, 2nd paragraph** – A crosswalk should be provided that identifies the number of samples collected from each medium and the samples added from the pre-demolition characterization activities.
8. **Page 19, Section 5.1.2, 1st paragraph** – Please include a discussion about any constituents that were eliminated as site-related contaminants due to detection frequency.

Review of this document meets the review cycle protocol of 90 days. Questions or comments concerning the contents of this letter should be directed to Angel Perkey at the above address or by phone at (865) 985-6851.

Sincerely

Randy Young Digitally signed by Randy Young
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Randy C. Young
FFA Project Manager
Division of Remediation – Oak Ridge Office

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