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

October 2, 2025

Mr. Roger Petrie
Federal Facility Agreement Manager
U.S. Department of Energy
Oak Ridge Office of Environmental Management
Post Office Box 4067
Oak Ridge, TN 37831

Dear Mr. Petrie

RE: TDEC Comments for the Remedial Design Work Plan for the Main Plant Area Groundwater Interim Record of Decision at the East Tennessee Technology Park, Oak Ridge, Tennessee (DOE/OR/01-3005&D1)

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation, Oak Ridge (DoR-OR), received the above referenced submittal on July 2, 2025, as transmitted by the U.S. Department of Energy (DOE). TDEC reviewed the document in accordance with the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR).

TDEC provides the following comments and requests the DOE schedule a meeting to discuss, prior to submission of a draft D2. Questions or comments concerning the contents of this letter should be directed to Heather Lutz at 865-310-0474 or heather.lutz@tn.gov.

Sincerely

Eileen Marcillo
FFA Project Manager
Division of Remediation – Oak Ridge Office

Enclosure

ec: Samantha Urquhart-Foster – EPA
Carl Froede – EPA
Erin Sutton – DOE
Mark McIntosh – DOE
Sam Scheffler – DOE
Tanya Salamacha- UCOR
Bob Gelinas- UCOR
Jared Brabazon- TDEC
Randy Young - TDEC
Heather Lutz- TDEC
ORSSAB
OREM Mailroom

xc: Wade Creswell, ORRCA
Amy Fitzgerald, ORRCA
Terry Frank, ORRCA
Warren Gooch, ORRCA

General Comments:

1. The report contains numerous groundwater elevation contour maps which are very helpful in understanding groundwater and contaminant flow. Please include an "ETTP-wide" groundwater elevation contour map for the separate units, overburden and bedrock zones. These maps will facilitate big picture assessment of plume movement or potential impacts beyond the six chlorinated volatile organic compound (CVOC) plumes addressed under this Remedial Design Work Plan (RDWP).

2. Please put tables and figures within their respective sections. For example, table 4.1, figure 4.26 and figure 4.27 are not within the *4.3.1.1 Mitchell Branch comingled plume/K-1407-B* but are rather out of place in the *4.3.1.2 K-1401* section. Another example is table 4.5 and figure 4.31 regarding K-1401 which is out of place in section *4.3.1.3 K-25/K-1024*. Please update the text to have appropriate tables and figures within their respective text sections.

3. As requested during the data quality objective (DQO) session for this RDWP, please include flow directions on the groundwater contaminant plume maps.

4. Please clarify in the text that dense non-aqueous phase liquid (DNAPL) may not migrate in the same direction as groundwater flow. The proposed pre-design investigation (PDI) should include assessing DNAPL migration pathways. Please include details on how this assessment will be conducted, specifically in the deeper bedrock wells. Discuss how the uncertainty associated with the migration of DNAPL will be addressed in this work scope and provide details regarding how those uncertainty discussions will be addressed with the tri-parties.

Phase 2 Information – Request for Additional Details

5. Page 4-33, 2nd paragraph after bullets – This paragraph discusses that Phase 1 activities listed in this RDWP will inform Phase 2 activities and an adaptive management approach would be used. TDEC agrees with this approach but requests further clarification in the document on the following:
    a. What Phase 1 data will directly inform Phase 2 work scopes?
    b. What is the touch point(s) for the tri-parties to discuss the Phase 2 work?
        i. How does that fit in the plan and schedule?
    c. How will Phase 2 decisions be made?
    d. How are those decisions planned to be documented?
    e. What is the current anticipated scope for Phase 2?
    f. What is the current anticipated schedule for Phase 2 activities?
    g. How will Phase 2 information be collected and evaluated - prior to implementation of the interim remedy?

6. This RDWP does not currently include Phase 1 activities designed to inform assessments of fractures and deeper flow zones and potential migration of other contaminants during the execution of the interim action. Please clarify how the Phase 2 portion of this

work will support evaluating fracture connectivity, flow directions, and fracture network assessments which are necessary to adequately evaluate impacts of the remedy.

Baseline Delineation Details

7. While this RDWP targets attaining information to support the design of the CVOC in-situ bioremediation system, other constituents of concern (COC) exist in this environment. DOE should ensure that during implementation of the selected remedy, all COCs do not migrate in a way that would impact the subsurface beyond the original plume boundaries. This RDWP should address additional information needs to ensure that baseline sampling conducted will provide a solid understanding of the existing site conditions (including all COCs at full vertical delineation) to adequately provide a baseline for comparison of concentrations of all COCs during and following the execution of the interim action. This includes metals and radionuclides, in addition to the CVOC constituents. It may be prudent to expand the sampling list for some or all the listed wells to include the full suite of COCs. Please provide explanation regarding how these baseline data will be gathered to support evaluation of all COCs to ensure protectiveness.

8. Please describe in the text of this document, how the baseline values for the radionuclides and metals will be collected/generated to support the evaluation of potential mobilization of byproducts in the implementation of the remedy.

9. Based on the interim Record of Decision (IROD) text, TDEC expects baseline assessment (both wet and dry seasons) of current site conditions. Please include text to describe when that evaluation may occur. Is this a Phase 2 portion of the process? Provide schedule and details in this document.

Borehole Geophysics Details:

10. **Borehole Geophysics** - Please provide additional details regarding the borehole geophysics phase of this work in all appropriate locations. TDEC requests that DOE consider other borehole logging tools that may support the characterization of the site beyond televiewers and caliper only. Please provide further descriptions of geophysical tools or combination of assessment tools, that may be used to assess the existing down hole characterization needs associated with this project, including DNAPL presence, top of rock, fracture interface, flow, etc. Please explain why other borehole logging tools were ruled out, if done so, to limit current plan to only televiewers and caliper.

Specific Comments:

11. **Section 1.1, Remedial design purpose and scope, page 1-6 top of page.** TDEC strongly recommends including text in this section that clearly states that under the Zone 2 Soils ROD, soil as a threat to groundwater, was characterized and remediated to soil clean-up levels that were calculated using maximum contaminant levels (MCLs). This will ensure clarity for future tri-party leaders regarding process completeness attained here supporting more efficient reviews of final documents moving forward.

12. **Page 2-2, Section 2.2 – Description of Individual Roles and Responsibilities, 1st paragraph.**
    Please confirm wording and intention with the statement: DOE's contractor's project manager (PM)..... "holds decision making-authority over resource allocation, scope adjustments, and regulatory coordination." Specifically, please describe how regulatory coordination and engagement will occur, and how tri-party participation can be expected to proceed. TDEC reiterates that our primary points of contact are with DOE and the U.S. Environmental Protection Agency (EPA) and will not direct regulatory coordination with DOE's contractor's PM.

13. **Figure 4.27** – The bedrock zone plume map for Mitchell Branch shows differentiated orange (>1000 micrograms per liter [ug/L]), yellow (100-1000 ug/L), and green (100 ug/L) areas north of Mitchell branch, yet no wells are present. Since the intent of the IROD is to address contamination above 1,000 ug/L, and there is uncertainty even at those concentrations in the boundary of this plume, it is recommended that wells be installed north of Mitchell Branch to better delineate this bedrock plume during this RDWP phase.

14. **Pg 4-34, Lateral and Vertical limits of the active remediation zone**
    Please address contamination management procedures within the text here, specific to the drilling techniques proposed.
    a. Please explain in the text how the potential for "dragging contamination to deeper depths" when drilling within a contaminant mass (e.g. DNAPL or otherwise) to determine vertical extent, will be managed. Please list options and state clearly the understanding that there is a requirement not to further spread contamination during drilling activities.
    b. Please discuss the management approach/strategy intended for securing open holes during periods of inactivity, such as prior to well installation or inadvertent or unscheduled delays.

15. **Pg 4-39, Section titled "Overburden Zone (0-24 feet bgs).**
    "Overburden" is not a depth. It's a lithology description. Defining overburden as 0-24 feet below ground surface (bgs) and including overburden materials, overburden bedrock interface, weathered rock and bedrock outcrops all in the term 'overburden' does not allow for clear communication and enhances the likelihood that these differing site conditions will not be attributed appropriately when modeling or defining the different average characterization parameters associated with the differing lithology across these areas of concern. Please refer to lithology within the parameters of the definitions. Recommend rewording for clarity.

16. **Pg B-41, Section B.4.1.2, Bedrock Boring and Sampling**
Please include information outlining the procedure used to differentiate between soil and weathered bedrock using the intended rotosonic drilling technique. Please identify how the top of rock will be assessed/documented specific to the conditions expected in this formation.

17. **Appendix B Field Sampling Plan (FSP) – Oil Red O Test information - CVOCs or total petroleum hydrocarbons**
Please reference literature or experience using this 'Oil Red O Test' technique to attain information related to chlorinated solvents as found in these impacted areas. Please share (or reference them in the text) the standard operating procedure (SOP) and references associated with this characterization strategy for chlorinated solvents.

18. **Appendix B FSP – Photoionization Detector (PID) technique when used for field screening**
Using a PID in open air, over cuttings or core to define screened intervals is potentially flawed. TDEC requests headspace readings be used to define these zones, as headspace is more aligned with industry standard for qualitative field measurements of VOCs during environmental site characterization. Using a PID over core in open air is an industrial hygiene (IH) screening tool to ensure safe breathing zones for the workers collecting the samples and evaluating lithology. While this IH protectiveness measure is a relevant step in the process, headspace samples should be used to qualitatively assess concentrations and gather information to help determine screen intervals. This will help ensure defensibility of the data and selections.

19. **Appendix B FSP -Borehole Geological Logging Field Logs and Records,**
Please include text to state the drilling logs/field records will document the volume of water used/injected and volume of water recovered estimates during drilling. Additionally, the well development logs should record the volume of water injected and recovered during well installation and well development activities.

20. **Page B-57, B.4.2.4 Well Development** – Please include text in this section to ensure well development for these wells follows EPA guidance. Specifically, please note that EPA guidance (https://www.epa.gov/sites/default/files/2015-06/documents/welldevelp_0.pdf) states, "If water was added during well construction or development, two to three times the volume of water added must be removed." In addition to parameter stabilization addressed in the Field Sampling Plan (FSP), please also remove water where appropriate according to this guidance.

21. **B.6.2 Waste Characterization/Disposal Text**
At the time the K31/33 ROD and Main Plant IROD were signed, the three parties agreed a wastewater disposal evaluation would be conducted in a post-ROD document for these projects. This RDWP references an internal United Cleanup Oak Ridge document which is not the appropriate post-ROD document for this evaluation. TDEC recommends either including this evaluation in this document or specifying what post-ROD document

will discuss the wastewater disposal evaluation. This evaluation should document the receiving facility can receive and treat all the contaminants of concern to be protective of the receiving streams.