STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation, Oak Ridge Office
761 Emory Valley Road
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July 11, 2023

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

TDEC Comments: Fiscal Year 2023 Phased Construction Completion Report for the Oak Ridge Reservation Environmental Management Waste Management Facility (DOE/OR/01-2941&D1)

Dear Mr. Petrie

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation - Oak Ridge Office, received the draft (D1) Phased Construction Completion Report (PCCR) on March 27, 2023. TDEC reviewed the document in accordance with the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR), including notification of an extension of the 90-day review protocol to support DOE's prioritization of TDEC review of the *Remedial Design Work Plan/Remedial Action Work Plan for the Groundwater Field Demonstration at the Environmental Management Disposal Facility, Oak Ridge, Tennessee* (DOE/OR/01-2948&D1).

As noted in TDEC's letter approving the final (D2) Fiscal Year (FY) 2022 PCCR, the state is committed to working with the FFA parties to complete 1) a Remedial Design Report Work Plan Addendum (RDR-A) to add wells to the detection monitoring network, and 2) a revised Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) that has needed updating for the past decade.

As a condition of TDEC's FY 2022 PCCR approval, the FFA parties met on December 14, 2022, to scope improvements to the FY 2023 report reviewed by this letter with a goal of resolving concerns with the FY 2022 report. TDEC urges DOE to resolve outstanding issues, as the need for the FFA parties to continue generating and responding to comments is not the best use of resources. Unresolved issues include the following:

- Figures (graphics) showing relevant details are either missing or are unclear due to illegible text, pixelation, etc. In some cases, it would help to generate larger figures.
- The document contains inconsistencies between text and figures and among figures.
- The report should provide the information the reader needs to understand the evaluations it summarizes. It is acceptable to cite the SAP/QAPP for more details, but the PCCR needs to include enough information to support findings and conclusions.

- Figures 15, 16, and 17 remain unclear, as does the process by which they were developed. See TDEC's letter on the D2 FY2022 PCCR and the enclosed comments for additional details.
- Present the water-phase B-coefficient (B_w) for all pneumatic piezometers (e.g., Table 24) rather than selected piezometers, and clarify how the geologic material (bedrock vs. residuum) affects data evaluation.
- Improve consistency within the document. For example, Fig. 19 labels the Y-axis as "Excess Porewater Pressure," but associated text on the same page describes these values as "changes from initial conditions." As explained by Dr. Benson, these values represent changes (deltas) in pressure from the lowest values recorded. Is it appropriate to equate this with 'excess' pressure at all locations?

TDEC looks forward to receiving an approvable work RDR-A for integrating wells downgradient along geologic strike into the detection monitoring program. In the interest of minimizing further delays in achieving a compliant monitoring program, and in light of apparent confusion regarding TDEC's approval of the FY 2022 PCCR, TDEC clarifies that ultimate approval of the FY 2023 PCCR should not be construed as approval of the RDR-A, which is undergoing review in accordance with the FFA.

Resolution of the enclosed comments will facilitate TDEC approval of the document. Questions or comments concerning the contents of this letter should be directed to Brad Stephenson at the above address, by phone at 865-352-1235, or by e-mail at brad.stephenson@tn.gov.

Sincerely

Randy C Young
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Randy C. Young
FFA Project Manager
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Enclosure

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Enclosure - Comments

1. **Page 4, 1st full sentence**
   Clarification is requested. This sentence does not appear consistent with a 2017 FFA modification (FFA Change Control Number FFA-PM-16-006) that states:

   > Modification(s): Addition to Appendix E
   > A milestone of July 27, 2017 for the D2 Environmental Management Waste Management Facility (EMWMF) Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) will be added.

   The FFA modification explained the 2017 milestone was for a D2 SAP/QAPP that would address and incorporate "more difficult issues." The Tennessee Department of Environment and Conservation (TDEC) understands DOE submitted a D1/R1 revision in 2017, but: 1) it was not a D2; 2) it did not address the more difficult issues; and 3) neither TDEC nor the U.S. Environmental Protection Agency (EPA) approved it. TDEC also understands a revised SAP/QAPP is now being prepared to address the more difficult issues. Is that the revision initiated in Fiscal Year (FY) 2021 as mentioned in the text?

2. **Page 8, Figure 3 & Page 40, Figure 12**
   a. Figure 3 omits several streams identified on Figure 12—e.g., Northern Tributary 4 (NT-4) and stream(s) along the northern boundary of EMWMF. Revise Figure 3 and/or Figure 12 for accuracy and consistency.

   b. Based on Figure 12 and text throughout the report, the surface water station on the eastern side of EMWMF should be labeled *EMWNT-03B* instead of *EMWNT-03*.

   c. Figure 3 indicates surface water station EWMWNT-03 (EMWNT-03B) is not on a stream. Showing NT-3 on the map in response to Comment 2a will resolve this issue.

   d. Monitoring well GW-363 is symbolized on Figure 3 as a deep well, but Figure 12 designates it as a shallow well. Revise the figure(s) for accuracy and consistency.

   e. Revise the map legends and/or associated text to define/describe the distinction between shallow and deep wells. For example, text in Section 5.3.2.1 indicates shallow wells are those completed less than 50 ft below ground surface (bgs).

   f. Replace Figure 12 with a map like Figure 3 that is clear and legible (not pixelated).

   g. Update the groundwater contamination plumes shown on Figure 12 with the most recent data. The figure indicates the map was updated in 2019, and it is unclear the plume configuration matches more recent maps, such as Figure 4.2 in the 2022 Remediation Effectiveness Report.

3. **Page 10, Table 2**
   a. The last four rows in this table document disposal in EMWMF of more than 35 tons of waste generated at the Y-12 National Security Complex (Y-12) during FY 2022. For the past several years, TDEC has urged the U.S. Department of Energy (DOE) to monitor EMWMF landfill

wastewater for mercury using analytical methods that are sufficiently sensitive to evaluate compliance with the recreational ambient water quality criterion (AWQC) of 0.051 micrograms per liter (µg/L). DOE began using a sufficiently sensitive method in 2016, and TDEC notes the data revealed no mercury concentrations above the recreational AWQC. This is good news.

Unfortunately, data available in the Oak Ridge Environmental Information System (OREIS) indicate use of the appropriate method was discontinued in early 2019 before initiating disposal of mercury-bearing waste began for the four waste lots:

- May 2019: 304.3 Biology Complex Facilities...
- May 2022: 306.1 Buildings 9213 and 9409-36
- September 2020: 310.1 Uranium Processing Facility Contaminated Soil
- April 2021: 310.2 UPF Contaminated Debris and Incidental Soil.

TDEC notes the project name for Waste Lot 310.2 in Table 2 ("UPF Contaminated Debris and Incidental Soil") differs from the description provided in the EMWMF monthly scale reports provided to TDEC. In those reports, Waste Lot 310.2 is described as "Debris and incidental soil generated during construction of the Uranium Production Facility," except for November 2021 through January 2022, when no description is provided.

Once again, TDEC urges DOE to monitor EMWMF landfill wastewater with a laboratory method that supports a determination whether discharges to the Bear Creek watershed comply with the recreational AWQC for mercury. TDEC advises DOE to resume this practice in parallel with preparation, review, and approval of documents that will eventually lead to a requirement to do so in the Record of Decision (ROD), despite continued delays in revising the SAP/QAPP.

4. **Page 10, Section 3.3, 1st sentence**
The report estimates 3.6 million (M) cubic yards (yd^3) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) waste require disposal. The text should clarify whether this estimate applies to the total volume of CERCLA waste or only the waste assumed to be disposable on the Oak Ridge Reservation (ORR).

   The EMWMF will accommodate 2.331M yd^3, leaving a remainder of about 1.269M yd^3. Assuming all that waste is disposed at the Environmental Management Disposal Facility (EMDF), and applying the 25% volume contingency assumed in the EMDF ROD for a total of 1,586,250 yd^3, that does not account for about 613,750 yd^3 (difference between 1,586,250 yd^3 and the planned EMDF volume (2.2M yd^3). Please clarify the apparent discrepancy and revise the text if appropriate.

5. **Page 11, Section 3.4, last sentence**
The text states that an annual closure discussion is conducted with the Project Team. Document when this discussion occurred during FY 2022 or remove the sentence. TDEC staff are unable to recall or find information about the discussion.

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6. **Page 11, Section 3.5, last sentence**
   Would it be more accurate to state that DOE will *ensure* volume-weighted sums of fractions (VWSFs) remain under 1.0 when EMWMF is at capacity? Such wording would convey DOE is actively managing waste acceptance in accordance with the *Attainment Plan for Risk/Toxicity-Based Waste Acceptance Criteria at the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-1909&D3). Consideration should be given to similar wording in Section 3.14 (p. 32, third bullet) and Section 6 (p. 75, third bullet).

7. **Page 16, Table 5**
   TDEC appreciates DOE's focus on minimizing closures of leachate collection system valves and reporting closures that occur. TDEC also appreciates the engineering evaluation, summarized during the February 22, 2023, project team meeting, that demonstrated most closures are unlikely to impound more than 1 foot of wastewater on the liner.

   TDEC requests incorporation of similar evaluations into this table and/or the associated text. TDEC only seeks documentation of such exceedances and does not seek further action, given DOE's diligence in minimizing such exceedances.

8. **Page 17, 2nd paragraph, 4th sentence**
   Consider clarifying this sentence. The detected results *are* sample results, so the meaning of *sample results...and the detected results* is unclear.

9. **Page 17, 2nd paragraph, last sentence**
   Consider clarifying or deleting this sentence. It may be partially redundant with the third sentence in the paragraph.

10. **Page 17, Table 6**
    a. Explain why discharge limits listed in the table differ from those in the SAP/QAPP (DOE/OR/01-2734&D1) for some chemicals, such as chromium, copper, and lead. Revise the table as appropriate.

    b. Clarify why chemicals with no discharge limits, designated with *NA* [not applicable], are analyzed and documented in the table.

    c. Consider replacing *Compound* with *Analyte* or *Constituent* since the table includes radionuclides and chemicals that are not compounds.

11. **Page 18, Table 6 (cont.) Footnote a**
    a. In the first sentence, revise the text to clarify TDEC approved the cited SAP/QAPP (DOE/OR/01-2734&D1) *for interim use*, based on a DOE commitment to work with TDEC and EPA to prepare a D2 version by the July 27, 2017 milestone in Appendix E of the Federal Facilities Agreement (FFA) (Change Control Number FFA-PM/16-006). This comment also applies to the first footnote (a) for Table 7 on p. 19.

    b. The second sentence partially addresses TDEC Specific Comment 3 on the D1 FY 2022 Phased Construction Completion Report (PCCR) regarding the need to clarify how detection

limits relate to discharge limits. It would be better to show the range of detection limits reported by the laboratories for each analyte/constituent because the FY 2023 PCCR continues to apply discharge limits TDEC accepted *for interim use* with the understanding they would be updated in 2017. In the intervening timeframe, the bases for some discharge limits have changed, even if EMWMF documents do not reflect those changes.

c. Correct *TDEC 400-40-3* to *TDEC 0400-40-03-.03(3)(g)*, and cite the most recent version (September 2019) instead of April 2015. This comment also applies to the first footnote (a) for Table 7 on p. 19.

12. **Page 19, Table 7**
    a. Add the range of detection limits for each analyte in the table.

    b. Clarify why chemicals with no discharge limits, designated with *NA*, are analyzed and documented in the table.

    c. Polychlorinated biphenyl (PCB) Discharge Limits: Footnote "a" states the non-radiological discharge limits are based on Tennessee AWQC established in a 2007 version of TDEC 1200-4-3. The 2007 PCB AWQC for fish and aquatic life was 0.014 µg/L, not 0.5 µg/L.

    TDEC 1200-4-3-.05(8) of the 2007 regulation allows for using a detection limit of 0.5 µg/L for PCBs to determine compliance with the AWQC for situations where the AWQC is less than an analytical method capability. Since 2007, technological capabilities have advanced significantly. Current technology achieves detection limits much lower than 0.5 µg/L using EPA-approved analytical methods.

    Due to these advances in analytical methods, PCB concentrations can be determined and compared against more protective numerical criteria. The EMWMF ROD has still not been updated to include ARARs for discharge limits. Therefore, based on the current capabilities of analytical methods and more recently promulgated AWQC regulations, non-radiological discharge limits should be based on the most recent (September 2019) Tennessee Water Quality Criteria for Fish and Aquatic Life (TDEC 400-40-03).

13. **Page 24, Figure 10**
    Consider showing all values to document the lack of notification leakage rate exceedances during FY 2022 and other recent years.

14. **Page 24, Section 3.8.1, 1st paragraph, last sentence**
    Was the clean stormwater collection area removed during FY 2022?

15. **Page 25, Section 3.8.2, 1st sentence**
    Revise the text to define *down-drain (DD)* or explain/describe its purpose and function.

16. **Page 25, Section 3.8.3, 3rd paragraph**
    a. Revise the text to add *as anticipated in the FY 2022 PCCR* after FY 2022.

b. Revise the text to clarify the end date for the FY 2022 sediment removal and dewatering effort.

17. **Page 26, Section 3.8.5, 5th bullet**
Change *water* to *wastewater*.

18. **Page 26, Section 3.8.6, bullet**
Cite a figure that shows the locations discussed in the text, including Building 2527-AE.

19. **Page 27, Section 3.9.2, including Table 9**
    a. The *planned* outage on 5/21 is not consistent with Section 3.9, *Unexpected* Incidents. Revise the text as appropriate for consistency.

    b. Section 3.9.2 is redundant to Table 5. Consider deleting this section or merging the two discussions of the same information.

20. **Page 27, Section 3.9.3**
In the second paragraph, add *2022* before *New Year's*.

21. **Page 28, Section 3.9.4, last sentence**
If accurate, the text should indicate an inspection was completed.

22. **Page 29, Table 11, Footnote a & Table 12, Footnote b**
Revise the text to clarify why the 2.39-acre area was isolated—e.g., to segregate clean stormwater.

23. **Page 32, Section 3.12, 1st bullet**
Despite the proven utility of radiological screening performed at EMWMF and other waste management facilities in the Oak Ridge area, DOE elected not to maintain a portal monitor at the EMWMF or fund TDEC replacement of the monitor that once operated there. As EMWMF is now accepting waste from the demolition of nuclear reactors and other radiological facilities at Oak Ridge National Laboratory (ORNL), DOE has deleted requirements for radiological surveys of inbound waste and inspections of truck beds and tailgates. In light of these changes, TDEC requests clarification of what radiological surveys DOE is now performing for waste being placed in EMWMF.

24. **Page 32, Section 3.14**
    a. Bullet 2: Since this is an EMWMF document, the statement about 3.6 M yd^3 of CERCLA waste is confusing. Revise the wording to clarify this volume applies to the amount of CERCLA waste to be generated from cleanup on the ORR or to be placed in onsite landfill, not just EMWMF.

    b. Bullet 4: Although text in this bullet is listed as a conclusion, it provides the first mention in the document of higher activity concentrations in leachate. The FY 2020 PCCR cited in this bullet discusses elevated activity concentrations of U-233/234 in leachate beginning in February 2019. At that time, the elevation of activity concentrations was assumed to be a short-term condition, and the concentrations were expected to decrease. The text of this

bullet suggests uranium concentrations in leachate continue to be elevated at some unspecified frequency. Given the apparent ongoing nature of the condition, revise the FY 2023 PCCR to summarize uranium levels in leachate in the years since the FY 2020 PCCR.

25. **Page 33, 4th bullet (and p. 75, 9th bullet) & Page 75, Section 6, 9th bullet**
Consider changing *Rainfall was* to *Landfill wastewater was* or *The effects of storm events were*.

26. **Page 35, Section 4, 2nd paragraph**
    a. Add the appropriate version of the cited document (DOE/OR/01-1884&D2) to the DOE Information Center (DOEIC). The DOEIC includes a TDEC letter approving a D3 version.

    b. Revise the paragraph for accuracy. The text states the Land Use Control Implementation Plan (LUCIP) is an appendix to a Remedial Action Work Plan (RAWP) (DOE/OR/01-1874&D4/R1). However, that RAWP only includes a reference to the LUCIP (DOE/OR/01-1884&D2); it does not include the plan. The LUCIP is actually included in the *Bear Creek Valley Watershed Remedial Action Report Comprehensive Monitoring Plan, Oak Ridge, Tennessee* (DOE/OR/01-2457&D4), as indicated in the last sentence of the paragraph.

27. **Page 37, Table 13, Footnote g**
Consider adding text to acknowledge the FY 2023 amendment to the 1999 Consent Order. At a minimum, the FY 2024 PCCR should include such an acknowledgement.

28. **Page 39, Section 5.2.1, 1st – 3rd paragraphs**
    a. Revise the text for accuracy. The ROD requires the detection monitoring program be in compliance with 40 CFR §264.97 and 40 CFR §264.98 during landfill operations, not just upon landfill closure.

    b. The EMWMF detection monitoring program must comply with TDEC 0400-12-01-.06(6)(i)6 and 40 CFR §264.98(f), which require periodic determinations whether there is statistically significant evidence of contamination from the landfill. General Comment 2 in TDEC's letter dated June 15, 2020, highlighted noncompliance with this requirement, stating in part:

> ...TDEC rules require that statistical methods " ... compare data collected at the compliance point(s) to the background ground-water quality data" (TDEC 0400-12-.06(6)(i)6(i). Data reported for each monitoring location should be individually compared not only to threshold values but also to data from the background wells, and this evaluation should be provided in the PCCR.

DOE responded the results are evaluated as described in the SAP/QAPP (DOE/OR/01-2734&D1) approved for interim use and the issue does not require changes to the PCCR.

TDEC advises DOE to comply with ROD requirements, despite continued delays in revising the SAP/QAPP and baseline characterization report. TDEC urges DOE to establish an FFA milestone for the baseline characterization report, as all the project team resolved the associated issues some time ago.

c. The detection monitoring program must comply with TDEC 0400-20-11-.17(4)(c) [formerly TDEC 1200-2-11-.17(4)(c)] which states the monitoring system must be capable of providing early warning of releases of radionuclides from the disposal unit. Over the past six years (since an initial field survey in 2017), DOE has taken preliminary steps toward eventual compliance with this requirement.

   TDEC looks forward to receiving an approvable work plan (Remedial Design Report Addendum [RDR-A]) for integrating wells along geologic strike into the detection monitoring program. In the interest of minimizing further delays in achieving a compliant monitoring program, and in light of apparent confusion regarding TDEC's approval of the FY 2022 PCCR, TDEC clarifies that ultimate approval of the FY 2023 PCCR should not be construed as approval of the RDR-A, which is undergoing review in accordance with the FFA.

d. Update the text of the second paragraph (and Section 5.5, second bullet and Section 6, eleventh bullet) to reflect the current agreement to install two shallow bedrock wells instead of three saprolite wells.

29. **Page 41, last sentence before Table14**
Revise the sentence as follows:

    Pending installation of bedrock monitoring wells in the area, the NT 5 surface water monitoring location EMWNT-05 is an appropriate interim monitoring location because surface water at that location presumably includes a component of shallow groundwater discharged along the western edge of the landfill.

30. **Page 41, Table 14, Footnote b**
Unless all the wells with formation names are completed in bedrock, revise the footnote and/or formation name to clarify whether any are completed in saprolite.

31. **Page 42, 2nd paragraph**
Expand the discussion of elevated uranium levels to describe how results for other parameters, including field measurements, are or are not anomalous in those samples. This should help reinforce the findings the uranium results are true outliers.

32. **Page 42, Table 15**
Add a note or explain in the text the rationale for sampling GW-918 later than most or all of the other wells. Using conventional groundwater sampling protocols, this upgradient background well should be sampled first. If dedicated pumps and tubing remain in the well, include that information in the explanation.

33. **Page 44, 2nd paragraph**
Given the continuing delay in updating the SAP/QAPP to reflect changes to the monitoring network agreed to years ago, cite the FY 2020 PCCR and/or include some or all of the following language, adapted from that document, to explain how/when the FFA parties agreed EMWNT-03A is not considered a suitable EMWMF monitoring location.

A replacement location for EMWNT-03A that is closer to EMWMF previously was identified by the Project Team. Based on the investigation results, sampling at this location (EMWNT-03B) was initiated in July 2019 as a best Management Practice to be more indicative of EMWMF conditions. This location will be incorporated into the SAP/QAPP as a replacement for EMWNT-03A.

34. **Page 45, Figure 13A**
Figure 13 indicates uranium isotopes were sampled in November 2021 and resampled in December 2021, but Table 15 lists the resample date as 12/14/22. Revise as appropriate for consistency.

35. **Page 47, Section 5.2.3, 1st sentence**
For clarity, delete *For informational purposes*. Results of detection monitoring serve technical objectives and regulatory requirements and are not compared to threshold values merely for informational purposes.

TDEC approved the FY 2022 PCCR with this language, despite lack of consensus regarding the response to Specific Comment 14. Given the ongoing potential for different understandings of the wording, TDEC suggests removing the phrase as the simplest way to resolve the comment without altering documentation of what was done.

36. **Page 50, Section 5.2.5, last sentence**
TDEC looks forward to receiving an approvable work plan (RDR-A) for integrating wells along geologic strike into the detection monitoring program. In the interest of minimizing further delays in achieving a compliant monitoring program, and in light of apparent confusion regarding TDEC's approval of the FY 2022 PCCR, TDEC clarifies that ultimate approval of the FY 2023 PCCR should not be construed as approval of the RDR-A, which is undergoing review in accordance with the FFA.

37. **Page 50, Section 5.3.1, 1st sentence**
Revise the description of operations monitoring to acknowledge groundwater levels are also evaluated to determine their positions relative to the landfill liner system.

38. **Page 51, Section 5.3.2**
This document does not provide the data to support the statement that the potentiometric surface remains below the geologic buffer zone during FY 2022. Provide a map illustrating the surface of the geologic buffer so that all data needed to support this conclusion are included in the PCCR.

39. **Page 51, Table 21**
Unless all the wells with formation names are completed in bedrock, revise the footnote and/or formation name to clarify whether any are completed in saprolite.

40. **Page 51, last sentence on page**
Revise the sentence and/or Figures 16 and 17 for clarity, as the maps do not show the Rome Formation, nor do they show the locations of the topographic saddles.

41. **Page 52, 2nd & 3rd full sentences on page**
    a. Given the absence of groundwater monitoring wells or piezometers near the northwestern part of the landfill, revise the text to provide a basis for the statements EMWMF is not hindering flow or impacting the potentiometric surface in that area and that potentiometric surfaces in that area are controlled by a culvert where NT-5 flows under the perimeter road.

    b. The text discusses a low area along *NT-5/perimeter road culvert just west of EMWMF*. Cite a figure with a map showing these features.

42. **Page 52, 1st paragraph, last two sentences**
    Revise the text to clarify what the ditch separates and clarify the basis for the hypothesis the potentiometric surface would behave differently above Cells 5 and 6 than above Cells 2 and 3.

43. **Page 52, 2nd paragraph, last sentence**
    Remove this sentence from the text, as it is not relevant to annual monitoring/operational information presented in the PCCR.

    TDEC acknowledges the best opportunity to characterize groundwater flow conditions is before landfill construction. Multiple DOE publications demonstrate the utility of groundwater tracing for producing clear, objective findings.

    TDEC notes Specific Comment 25 on the FY 2022 D1 PCCR requested removal of this sentence. DOE's response (see p. 212/222 in the FY 2022 D2 PCCR) stated the text was incorporated as a response to an EPA comment on the FY 2019 D1 PCCR. That is correct, but EPA Comments 21 and 22 (see p. 161/188 in the FY 2019 D2 PCCR) on that document do not request this language. On the contrary, the EPA comments highlight the need for tracing.

44. **Page 53, Figure 15**
    a. Replace the figure with one that is clear and legible. Consider adding profile views.

    b. Add a note to the legend to clarify negative values represent potentiometric surfaces below the bottom of the geologic buffer. As drafted, the legend describes the symbol as distance below the buffer, so the negative values then imply distance above the buffer.

    c. Add text to clarify how the potentiometric surfaces are determined in the absence of wells or piezometers immediately adjacent to the landfill, except near Cells 1 and 2.

45. **Pages 54-55, Figures 16-17**
    a. Replace the figures with maps that are clear and legible. Consider adding profile views.

    b. Define the pink dashed lines in the legends. Based on Figure 15, this symbol depicts the bottom of the waste cells.

    c. Add text to clarify how the potentiometric surfaces are determined in the absence of wells or piezometers immediately adjacent to the landfill, except near Cells 1 and 2.

d. Revise the text to clarify whether the potentiometric contours are based on or influenced by data from pneumatic piezometers (e.g., PP-01 and PP-05). Text in Section 5.3.2.2 (p. 59) the piezometers are above the saturated zone such that they do not measure groundwater levels. However, configurations of the contours (deflections around PP-01 and PP-05) suggest data from these locations are factored into mapping the water table. Are the completion elevations interpreted as upper bounds on the water table elevation at each pneumatic piezometer?

e. As noted in comments on previous PCCRs, these maps should clearly show the data which the contours are based (e.g., water levels from wells, piezometers, etc.) This warrants use of larger maps if necessary for legibility.

f. It is inappropriate to depict potentiometric surface elevations as solid contours where they are inferred due to lack of site-specific data, including the area northwest of GW-918 and GW-961. If DOE relies solely on the elevation of NT-5 surface water in lieu of water-level measurements from wells or piezometers, then NT-5 must be shown on the map along with the surface elevations used.

46. **Page 56, Section 5.3.2.1**
If appropriate, revise the text to note where surface water elevations are used in lieu of data from wells or piezometers.

47. **Page 60, Section 5.3.2.3, last sentence on page**
For clarity, add text to explain clipping. Wording from Response 30 to TDEC comments on the FY 2022 PCCR is acceptable. See p. 213/222 in the FY 2022 D2 PCCR.

48. **Page 62, Figure 21**
This graph presents water level data for several wells (e.g., GY-015, GY-012) which are currently not illustrated on any maps in the FY 2023 PCCR. Add a map that shows the location of these wells.

49. **Page 63, Table 25**
Add text to provide context for the high turbidity (up to 140 nephelometric turbidity units) at the wastewater discharge outfall (EMW-VWEIR). For example, do the highest turbidity readings correspond with discharge rates, which range an order of magnitude?

50. **Page 64, 1st bullet**
Correct the sentence to state the detection limits were below the EMWMF PCB discharge limit and remove the reference to an AWQC numerical PCB standard. Make this change throughout the document. The AWQC for PCBs in the Tennessee Water Quality Criteria, Fish and Aquatic Life TDEC 1200-4-3 (2007) is 0.014 µg/L, not 0.5 µg/L as listed on Table 7.

51. **Page 65, 1st sentence & Page 66, last sentence**
No document revision is required. However, the references to "currently required Fish and Aquatic Life AWQC" and "compliance with approved discharge limits" highlight the need to update the SAP/QAPP (DOE/OR/01-2734&D1) and evaluate data for compliance with the

recreational AWQC, in accordance with the EPA Administrator's dispute resolution decision dated December 31, 2020.

52. **Page 67, Figure 22**
Revise the symbology to clarify the location of the leachate sample location. The symbol is too small, and it is the same color as the streams.

53. **Page 68, 1st paragraph, last sentence & Page 75, 5th bullet**
Insert *interim* before *discharge limits*. The FY 2023 PCCR continues to apply discharge limits TDEC accepted *for interim use* with the understanding they would be updated in 2017. In the intervening timeframe, the bases for some discharge limits have changed, even if EMWMF documents do not reflect those changes.

54. **Page 68, last paragraph, 1st sentence**
Revise the text to clarify how continuous samples are collected weekly. Are these weekly composites of samples collected at a specific time each day?

55. **Page 70, Figure 23**
Add a note to clarify the average sum of fractions is a rolling 12-month average.

56. **Page 70, Section 5.3.7, 1st sentence**
Change *water* to *wastewater*, consistent with Section 3.7.1 and other parts of the document.

57. **Page 70, Section 5.3.7, last sentence & Page 75, Section 6, 4th bullet**
Revise the text to cite the section that explains what is meant by the "previously issued variance." Also, clarify whether the variance applies to a specific timeframe or is indefinite.

58. **Page 71, 2nd paragraph, 1st sentence**
    a. If appropriate, revise the text to clarify *upwind* and *downwind* refer to the prevailing wind direction.

    b. Clarify why Figure 3 shows no ambient air monitoring south/southeast of the landfill where people work in offices.

59. **Page 72, Section 5.5, 1st bullet & Page 75, Section 6, 10th bullet**
Given plans to improve the detection monitoring network, revise the sentence as follows: "...detection monitoring data provide no evidence that there is ~~no~~ groundwater transport of contaminants...."

60. **Page 72, Section 5.5, 2nd bullet & Page 75, Section 6, 11th bullet**
Revise the wording to clarify what will be reported in the PCCR—i.e., installation and development of the wells.

61. **Page 73, Section 5.5, 1st bullet on page & Page 75, Section 6, 12th bullet**
No document revision is required. However, TDEC notes the wording *Detection monitoring results for surface water samples* is not consistent with the regulations, in which detection monitoring applies to groundwater samples. TDEC recognizes surface water monitoring is being performed

on an interim basis, pending installation of wells along the western side of the landfill and their integration into the detection monitoring program. The parties should discuss the best way to refer to these surface water sample locations until the new wells are in place.

62. **Page 73, Section 5.5, 3rd bullet on page & Page 76, Section 6, 1st bullet on page**
    a. Revise the text to explain why groundwater elevations are below the bottom of the geologic buffer at all pneumatic piezometers when text in Section 5.3.2.2 (p. 59) states the piezometers do not measure groundwater levels.

    b. Revise the text for consistency with that on p. 59 which indicates PP-08 is completed in the saturated zone.

63. **Page 76, Table 31**
    Update the last sentence of the Status entry. Despite delays in revising the SAP/QAPP (DOE/OR/01-2734&D1), the EPA Administrator's dispute resolution decision was issued more than two years ago (December 31, 2020).

64. **Page 79, Section 7 & Appendix A**
    This SAP/QAPP (UCOR-4156) is also designated as a primary FFA document issued by DOE (DOE/OR/01-2734&D1). It should be cited as such in the references list and throughout the ARARs table.

    Despite delays in revising the SAP/QAPP (DOE/OR/01-2734&D1), the EPA Administrator's dispute resolution decision was issued more than two years ago (December 31, 2020).

65. **Page C-3, Table C.1**
    Consider adding a Gantt chart to show which activities occur in parallel and which are sequential.

66. **Pages D-3 through D-6, Table D.1**
    Revise Table D.1 to include all federal and state numerical criteria. A maximum contaminant level (MCL) exists for PCBs. Also, per TDEC 0400-40-03, the numerical criterion for lead is 0.005 milligrams (mg/L).

67. **Page D-12, Table D.3, Note 3**
    a. Add the cited reference (UCOR 2011) to the list of references in Section 7.

    b. Are the action levels from the 2011 UCOR environmental monitoring plan or the 2016 SAP/QAPP (DOE/OR/01-2734&D1)?

End of Comments