



**STATE OF TENNESSEE  
DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

Division of Remediation, Oak Ridge Office  
761 Emory Valley Road  
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January 23, 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

**Comments: Remedial Design Report/Remedial Action Work Plan for the Environmental Management Disposal Facility, Oak Ridge, Tennessee: Early Site Preparation Activities (DOE/OR/01-2934&D1)**

Dear Mr. Petrie

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation - Oak Ridge Office, received the subject work plan on December 28, 2022. This letter provides comments based on TDEC's review. The comments focus on compliance with Applicable or Relevant and Appropriate Requirements (ARARs) in the [Record of Decision \(ROD\)](#), including the [Endangered Species Act \(ESA\)](#) and the state's Aquatic Resource Alteration Permit (ARAP) program.

TDEC received an earlier draft of a similar plan on January 3, 2019. That document was called *Site Preparation Plan for the Proposed Environmental Management Disposal Facility for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal, Oak Ridge, Tennessee* (DOE/OR/01-2805&D1). In letters dated March 6, 2019 and September 14, 2022, TDEC committed to review the 2019 plan upon ROD approval. During a project team meeting on September 28, 2022, the U.S. Department of Energy (DOE) informed TDEC the 2019 plan no longer needs review because it is superseded by the 2022 plan addressed by this letter.

**Specific Comments**

**1. Page 1, Section 1.1, last paragraph**

Revise this one-sentence paragraph to clarify the early site preparation (ESP) activities are not associated with the design or construction of landfill elements, including wastewater management facilities, that will contain or treat contamination related to waste placed in the future landfill. In addition, note that ESP activities will protect public health and the

environment through control of stormwater and associated sediment, avoidance and/or mitigation of impacts to threatened and endangered species, and compliance with other substantive requirements in the ROD.

2. **Page 3, Fig. 1**

Consider replacing the map with a sharper (less fuzzy) image. Consider including a full-page map, similar to Fig. 2.

3. **Page 5, Section 2.2, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence**

No document revision is needed in response to this question, but DOE's response may inform planning for baseline and detection monitoring.

Are there sufficient bedrock wells along geologic strike between the Bear Creek Burial Grounds (BCBG) and the Environmental Management Disposal Facility (EMDF) site to support this statement? The cross section in Fig. E-10 in the D5 Remedial Investigation/Feasibility Study (RI/FS) shows shallow bedrock and deep bedrock wells screened in relevant rock units, although some are not completed as conventional monitoring wells—i.e., they have large open borehole intervals. The inset map on that figure does not show wells along strike west of the BCBG. RI/FS Fig. E-2 shows wells further west, but all seem to lie updip from the "DNAPL Area."

4. **Page 5, Section 2.2, 2<sup>nd</sup> paragraph**

It is unclear whether all 32 piezometers have been monitored since 2018. Revise this paragraph for accuracy if warranted.

Technical Memorandum 2 (TM-2) documents the installation and monitoring of 16 "Phase 1" piezometers in 2018. Although the TM-2 transmittal letter forecasts delivery of Technical Memorandum 3 (TM-3) in August 2019 to document Phase 2 data, TDEC has not found that TM-3 was ever submitted.

5. **Page 5, Section 2.3, 1<sup>st</sup> paragraph, last sentence**

Delete "both shallow and deeper" unless geochemical or other data support the discharge of deep groundwater at EMDF. If the statement is supported, provide the explanation and clarify the apparent inconsistency with the last sentence in Section 2.3.

6. **Page 7, Section 2.4, Wetland delineations (also Pages F-6, F-15, F-20)**

a. In accordance with the state's ARAP program, wetland impacts exceeding 0.1 acre fall under individual ARAP coverage thereby requiring compensatory mitigation. Revise the text to acknowledge this requirement and note that ESP impacts will be tracked as part of the cumulative impacts associated with subsequent phases of work, including landfill construction, and mitigated as required. Add similar acknowledgements as appropriate on pages F-6, F-15, and F-20.

- b. Cite Fig. 3 at the end of the sentence that mentions 17 wetlands and improve the visibility/contrast of the wetlands on the maps in Figs. 3, F.1, and F.2. Alternatively, consider adding a separate map that shows the wetlands more clearly.
- c. Add text directing the reader to Fig. F.3 for a map of potential wetland impacts.
- d. Clarify the “road reroute section” cited in the second paragraph on Page 7 and the “Road Reroute section” cited in the last paragraph of Page F-16 refer to the section called “Reroute of Bear Creek Road and Haul Road” in Appendix F, Section F.4.2 (Page F-11). This appears to be the only part of the document that provides additional description.

7. **Page 7, Section 2.4, Stream surveys**

As noted in this section, the project lies in a watershed with a thriving population of Tennessee dace, which the state lists as “in need of management.” Although Tennessee dace were not observed during the brief onsite surveys, consider rewording this section (and similar language in Appendix F) to indicate the stormwater controls will protect this species in streams that may be impacted by ESP activities.

8. **Page 7, Section 2.4, Timber assessments (also Pages F-6, F-13, F-16)**

The document discusses the lack of a recent timber inventory and cites a map in a 2018 report.<sup>1</sup> That map and related text indicate part of the ESP area was assessed for timber in 2014 and 2015.<sup>2</sup> The document under review, the Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for ESP activities, summarizes the historical timber inventory, stating that relatively short loblolly pine trees provide the dominant forest cover, consistent with timber harvesting in 2000. Other parts of the document (e.g., p. 8 and p. F-7) suggest that rare species are not typically found in areas that were harvested 23 years ago.

Rather than relying on such assumptions, DOE should survey ESP areas for the potential presence of sensitive species known or suspected to be in the area before beginning ESP activities. TDEC’s rationale for this recommendation includes the following.

First, as noted in Comment 9a, there is some uncertainty whether loblolly pines provide roosting habitat for bats. As noted below, the ROD addresses requirements for compliance with the ESA.

Second, the forest composition may be more complex than suggested by the RDR/RAWP summary. The 2014-2015 inventory documents at least 36 tree species, although it is unclear how these species are distributed within the ESP area.<sup>3</sup> Ten trees measured at

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<sup>1</sup> [Natural Resource Assessment for the Proposed Environmental Management Disposal Facility \(EMDF\), Oak Ridge, Tennessee](#) (ORNL/TM-2018/515).

<sup>2</sup> The natural resource assessment states a 33-acre area of timber within the EMDF site south of Bear Creek Road has not been inventoried recently.

<sup>3</sup> *Fraxinus* (ash) was only identified to genus, not species.

sample points in the area had diameters at breast height (dbh, or 4.5 feet above ground) of 30 inches or more, including a 38-inch chestnut oak.

More than half the basal area was covered with trees that had dbh measurements of 10 inches or greater. These larger trees included tulip poplar, white oak, red maple, and sweet gum. Saplings, or trees between 2 and 10 inches dbh, included red maple, sweet gum, tulip poplar, sourwood, and dogwood, in addition to loblolly pine.

Third, neither the 2018 natural resource report nor the RDR/RAWP for ESP clearly document that sensitive species, including four-toed salamanders or other mobile species, have not migrated or reinhabited the ESP area in the 23 years since the last timber harvest.

9. **Page 8, Rare species surveys, 2<sup>nd</sup> paragraph (also Pages F-6, F-13, F-16, F-20)**

- a. TDEC understands the area to be cleared during ESP is forested primarily by loblolly pine trees, but there is uncertainty whether they provide roosting habitat for bats. A 2022 U.S. Fish & Wildlife Service (USFWS) report states bats are flexible in selecting tree species, noting adult females form maternity colonies in many tree species with suitable cavities or bark.<sup>4</sup> The report states factors such as forest successional patterns and stand/tree structure are more crucial than tree species for determining roosting habitat.

The ROD addresses DOE duties for compliance with the ESA, particularly with respect to several species of bats. Activities during the RD/RA phase of a remedial action must be consistent with the terms and scope of the ROD. The Species Status Assessment (SSA) report cited in the previous paragraph addresses the northern long-eared bat (NLEB). The SSA is not a regulatory document and only provides guidance. When the ROD was signed, the NLEB was listed as “threatened,” but a rulemaking was already in process to “uplist” the species. Now the final rule has been published and will become effective at the end of January 2023.<sup>5</sup> The final rulemaking itself, 87 FR 73488, determines the enforceable legal restrictions that apply to the species in its new status as an endangered species. These requirements are outlined at the end of the [final rule, 87 FR 73488-73502-3 \(November 30, 2022\)](#).

For this reason, TDEC strongly urges DOE to complete necessary tree removal during the winter, i.e., by mid-March, when bats are less likely to roost in these areas. As recommended in TDEC’s [Acoustic Survey of Bats at the Proposed EMDF Site](#) (transmitted to DOE on February 28, 2017):

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<sup>4</sup> USFWS, 2022, [Species Status Assessment Report for the Northern long-eared bat \(\*Myotis septentrionalis\*\)](#), Version 1.2, U.S. Fish and Wildlife Service, Great Lakes Region, Bloomington, Minnesota, August.

<sup>5</sup> This web page contains links to the final rulemaking published on November 30 (87 FR 73488) and links to other material about the NLEB: <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>.

The USFWS has published a framework suggesting timber removal at a project site should only occur during the fall/winter season (bat hibernation period). In other words, trees should not be harvested during spring/summer season when bats are using trees (and forests) for foraging, roosting, and while females are raising their young....

The 2022 USFWS report finds the spring migration period, when adult female bats move from caves to forests, typically begins in mid-March. The females and their young migrate back to the winter caves by mid-October. The report notes variation in the onset and duration of these migrations is based on latitude and weather; the timing may vary by location and annual weather patterns.

As noted in the USFWS report, bats may be affected directly by removal of occupied roost trees and loss of roosting and foraging habitat. Moreover, removal of occupied roosts during spring, summer, and fall is likely to injure or kill bats. This is particularly likely during cool spring months when bats enter torpor and when flightless pups or inexperienced flying juveniles are present.

It is TDEC's understanding that of the [final rule, 87 FR 73488-73502-3 \(November 30, 2022\)](#) addresses activities that will and will not violate the prohibitions of the ESA. Further, it is TDEC's understanding that, as required by the ROD, DOE has begun the consultation process with the USFWS. TDEC expects the ROD will be followed, as required by [40 CFR 300.435](#), but consultation and subsequent USFWS guidance can provide further clarification as to permissible activities and date restrictions for conducting these activities.

- b. Page F-13 (third paragraph) and Page F-16 (second and last paragraphs) include text stating, "tree removal is likely to be performed during the winter/early spring when bats would not be roosting in these areas." Spring begins March 20, so tree removal during early spring is not consistent with the recommendation to complete tree removal during the winter, i.e., by mid-March.
- c. TDEC advises caution regarding statements about the "minimal presence" of certain bat species. (Similar language is used on Page F-6.) DOE bat surveys identified fewer calls associated with the northern long-eared bat (*Myotis septentrionalis*), the Indiana bat (*Myotis sodalist*), and eastern small-footed bat (*Myotis leibii*). However, DOE and TDEC surveys identified three other bat species listed federally as threatened or endangered or state-listed as "in need of management," including the gray bat (*Myotis grisescens*), little brown bat (*Myotis lucifugus*), and tricolored bat (*Perimyotis subflavus*).

As documented in TDEC's [Acoustic Survey of Bats at the Proposed EMDF Site](#) (transmitted to DOE on February 28, 2017), automated bat identification software identified 14 bat species based on more than 16,000 bat calls recorded over approximately one month throughout the area of the planned EMDF. TDEC's survey was completed outside the USFWS-recommended monitoring period for Indiana bat surveys (May 15 through August 15), and TDEC recommended DOE conduct additional surveys during the recommended timeframe.

DOE completed additional surveys during the recommended timeframe in July/August 2017 and May 2018.<sup>1</sup> As described above, the DOE surveys identified six listed bat species, some of which were detected more frequently than others. However, the DOE surveys focused on the northern parts of the planned landfill and adjacent borrow area and collected little data in the area where ESP activities will occur. Only two stations were located south of the Haul Road, both of which were south of Bear Creek Road.

Collectively, DOE and TDEC surveys indicate several listed bat species are present in the EMDF area, at least during portions of the spring and summer. Therefore, great care is warranted to ensure compliance with the ESA.

10. **Page 8, Section 2.4, Rare species surveys, 3<sup>rd</sup> paragraph**

- a. The third and fourth sentences indicate the ESP area contains state-listed fauna, including "the highest densities of four-toed salamander breeding sites known on the ORR." DOE should revise the text to state it will notify TDEC's Division of Natural Areas and the Tennessee Wildlife Resources Agency (TWRA) of known or anticipated impacts to state-listed fauna. This is consistent with the approach taken by DOE during construction of the Stable Isotope Production and Research Center (SIPRC).<sup>6</sup> As stated on Page 3-13 of the Environmental Assessment for that project:

DOE and ORNL also consulted with the TDEC Division of Natural Areas and the TWRA concerning potential impacts to state-listed fauna and sensitive or rare habitat within or directly adjacent to the SIPRC area of disturbance. Responses from these agencies are provided in (Appendix C). In accordance with TWRA suggestions, species sweeps were conducted in spring 2022 to document and potentially move any four-toed salamanders to a safe distance from the proposed area of disturbance. No four-toed salamanders or four-toed salamander nests were found within the proposed disturbance area. Four nests were found outside of the disturbance area and were flagged for protection. Preservation, enhancement, or restoration of Wetland C could also mitigate potential impacts to the state-listed four-toed salamanders that occur within the wetland.

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<sup>6</sup> [Environmental Assessment, Construction and Operation of the Stable Isotope Production and Research Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee \(DOE/EA-2136\)](#).

- b. The last sentence states ESP activities will avoid habitats for four-toed salamanders (including breeding sites), wood thrushes, tubercled rein orchids, American ginseng, and pink lady's slippers. Based on the natural resource assessment area outlined in Fig. 3, it appears construction of the landfill and support facilities will eventually impact these important habitats. Consider adding a sentence indicating which future documents will address these impacts. Alternatively, this information could be added to (or after) the last sentence in Section 2.4. Similar wording should be added in Section F.4.2.

11. **Page 8, Section 2.5, Cultural resources, 1<sup>st</sup> paragraph, last sentence**

The text states DOE intends to avoid and preserve the Douglas Chapel Cemetery. If it becomes necessary to relocate the cemetery, DOE must consult with the Tennessee Historic Cemetery Preservation Program (THCPP). Contact information and guidance is available at <https://www.tn.gov/historicalcommission/state-programs/tennessee-historic-cemetery-preservation-program.html>.

12. **Page 14, Section 4.2.2, 5<sup>th</sup> paragraph, last sentence**

For consistency, consider replacing "Onsite Waste Disposal Facility" with "Environmental Management Disposal Facility." In addition, note that EMDF is also known as the "Onsite Waste Disposal Facility" in the acronym list and/or first uses in the text on Pages ES-1 and 1.

13. **Page 17, Section 5, 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> paragraphs**

The document asserts a monitoring plan is not required because ESP activities consist of new construction in a clean area. TDEC agrees it is not necessary to monitor for most contaminants typically found on Oak Ridge Reservation (ORR) demolition and environmental remediation sites. However, TDEC asserts stormwater monitoring is required, as explained in the following.

- a. Rules and regulations cited as ARARs in the ROD require stormwater management controls to ensure compliance with the terms and conditions of [General Permit No. TNR050000 \("Stormwater Multi-Sector General Permit for Industrial Activities"\)](#). ARARs also require construction management techniques to ensure stormwater discharge is managed properly, including without limitation the requirements in [General Permit No. TNR100000 \("General NPDES Permit for Storm Water Discharges Associated with Construction Activity"\)](#). These requirements include complying with water quality criteria in [TDEC 0400-40-03-.03](#), including prevention of discharges that impair the usefulness of waters of the state for any designated uses by [TDEC 0400-40-04](#). These requirements also prohibit the following in receiving streams.
  - Floating scum, oil, or other matter
  - Objectionable color contrasts
  - Materials in concentrations sufficient to be hazardous or detrimental to humans, livestock, wildlife, plant life, or fish and aquatic life
  - Discharges that would cause measurable degradation of waters with unavailable parameters.



Compliance with these ROD requirements is ensured through monitoring, which is, therefore, a substantive requirement of the ROD. Submittal of reports/forms specified in the General Permit is administrative and, therefore, not required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

- b. The Remedial Action Work Plan section incorporates the following document by reference: [Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee \(UCOR-5215\)](#). During December 2022, DOE provided an updated version (R1) of that document to support TDEC review of the RDR/RAWP. Since that document supports the RDR/RAWP, a primary Federal Facility Agreement (FFA) document, DOE should post the updated (R1) version of UCOR-5215 at the [DOE Information Center](#).
- c. The UCOR-5215 document does not address all the necessary components of the necessary stormwater monitoring. Therefore, revise the RAWP section of the RDR/RAWP to include the following.
  - i. Information regarding where daily precipitation data is obtained
  - ii. Define the sources and guidelines for environmental monitoring of stormwater effluent. Although they apply to demolition work in the Oak Ridge National Laboratory (ORNL), UCOR-5414 and UCOR-5390 appear to provide good examples for doing this.
  - iii. Include pre-construction (site-preparation) environmental monitoring consisting of:
    1. At least two baseline samples need to be obtained, at least one month apart, prior to the start of any demolition activities.
    2. Location of sampling sites needs to be provided.
    3. Potential pollutants need to be identified and reported.
  - iv. The construction initiation period should include:
    1. Once construction work has started, stormwater monitoring should be conducted during qualifying precipitation events. A qualifying event is defined as a rain event that (1) produces 1 inch or more of measured rainfall within a 24-hour period; 2) causes runoff toward the outfall; and/or 3) occurs after a dry period, defined as no measurable rainfall (i.e., < 0.1 inch) within a 72-hour period).
    2. Sampling frequency will be determined by designers. It is recommended to monitor quarterly, or after any significant activities that may directly or indirectly cause water quality issues.
  - v. A final monitoring event should be performed after the conclusion of the project.
  - vi. Sampling locations (outfall, catch basin, near stream, etc.) need to be identified on the site map.
- d. As stated in [TDEC's October 21, 2022 comments](#) on the [Field Sampling Plan for Baseline Groundwater and Surface Water Characterization at the Proposed Environmental Management Disposal Facility, Oak Ridge Tennessee \(DOE/OR/01-2812&D1\)](#):



Baseline sampling should begin as soon as possible. Ideally, sampling would begin before significant land disturbance associated with site preparation or the planned groundwater field demonstration. In any case, the likelihood that dry wells and/or streams will prevent sampling during some events should drive a timely start to ensure development of a statistically meaningful baseline data set before landfill operations begin.

14. **Page 19, Section 6, 1<sup>st</sup> paragraph, last sentence**

Add text stating DOE will notify TDEC and the U.S. Environmental Protection Agency (EPA) if potential or actual contamination is discovered or generated during ESP activities.

15. **Page 23, Fig. 6 & Section 7.1.2**

a. Under *OREM*, add the following text.

*Ensure scope of work is implemented in conformance with ARARs in the ROD.*

b. Under *Regulators*, add the following text.

*Provide oversight to ensure scope of work is implemented in conformance with ARARs documented in the ROD.*

16. **Page 24, Section 7.2, Table 2**

The schedule indicates much of the ESP work will occur during the winter wet season. Therefore, another section of the document should describe how DOE will respond to high-intensity rainfall, flash flooding, and excess stormwater that will need to be managed during such events.

17. **Page F-11, Section F.4.2, last paragraph, last sentence (continuing to Page F-12)**

TDEC understands DOE is consulting with the USFWS, as required by Section 7 of the ESA, to ensure ESP and landfill construction are performed in a manner that will not jeopardize the continued existence of listed species. TDEC supports this consultation and requests acknowledgement in the text the ESP will be carried out in accordance with USFWS guidance and recommendations.

18. **Page F-14, 1<sup>st</sup> paragraph, last sentence**

As documented during site characterization, DOE determined Northern Tributary 10 (NT-10), Drainage 10W (D-10W), and NT-11 are streams.<sup>7</sup> DOE must engage a certified Qualified Hydrologic Professional (QHP), as defined in TDEC 0400-40-17, to complete stream determinations for the unnamed drainage, NT-9, and any other channels that will receive stormwater drainage from culverts to be installed during ESP activities.

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<sup>7</sup> See p. 10 in the [Phase 1 Field Sampling Plan for the Proposed Environmental Management Disposal Facility for Comprehensive Environmental Response, Compensation, and Liability Act Oak Ridge Reservation Waste Disposal, Oak Ridge, Tennessee](#) (DOE/OR/01-2739&D2).

For features determined to be streams, the planned work must meet substantive requirements of the ARAP program in accordance with the ROD. For features determined to be wet-weather conveyances, there are no such requirements. In that case, TDEC would simply advise DOE to implement standard erosion and sediment control best management practices (BMPs).

Either way, it is important to document the determination for future reference. TDEC recommends submitting the determination to the Division of Water Resources (DWR). The DWR stores hydrologic determinations and provides an online viewer to minimize the need to reinvestigate a waterbody status in the future.

**19. Appendices A, C, D, and E**

Technical specifications in these appendices include references to a Storm Water Pollution Prevention Plan (SWPPP). TDEC understands these citations refer to a document called *Stormwater Management Requirements for Early Site Preparation for the Onsite Waste Disposal Facility, Oak Ridge, Tennessee* (UCOR-5215/R1, November 2022). Clarify this by correcting the citations or adding a note in the body and/or references section of the RDR/RAWP.

TDEC looks forward to working with the FFA parties to complete the site preparation activities in a manner that protects human health and the environment, as required by the ROD. Questions or comments concerning this letter should be directed to Brad Stephenson at the above address, by email at [brad.stephenson@tn.gov](mailto:brad.stephenson@tn.gov), or by phone at (865) 352-1235 (*new*).

Sincerely

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