



Environmental Management Disposal Facility Fact Sheet

The U.S. Department of Energy (DOE) Oak Ridge Office of Environmental Management (OREM) wants to build a new landfill to dispose of their radioactive, hazardous, and toxic wastes in Oak Ridge. They are running out of available space at their current CERCLA landfill, the Environmental Management Waste Management Facility (EMWMF). DOE named the proposed new landfill the Environmental Management Disposal Facility (EMDF). OREM recently released a proposed plan for the public to read and provide opinions back to DOE.

One required part of the proposed plan is a section called "State Acceptance". This section presents the State of Tennessee's position and key concerns with DOE's proposal. The State Acceptance section describes important issues that have not been resolved enough to gain State approval of DOE's proposed plan. DOE must work with the State to resolve these key issues which include:

1. DOE is studying the suitability of the proposed location. To gain the State's support, DOE may need to revise the landfill design, because groundwater near the land surface could help contamination escape into streams. This might affect the types and amounts of waste DOE could place in the landfill.
2. DOE and the regulators (the State & EPA) need to agree on legal requirements. Some of these requirements were developed from experience with existing landfills across Tennessee. The proposed plan calls these requirements "ARARs".
3. DOE needs to provide more details about what kind and how much waste it intends to put in the landfill. Because some of the waste will remain dangerous for many years, it is important for the State to understand possible future impacts to the public and the environment.
4. DOE is working to complete technical assessments required by its own rules. The State needs to evaluate DOE's findings to both inform the State's final decision on this landfill and to understand how to minimize the possible future risks from the landfill.
5. Because fish in Bear Creek already contain contamination, the State is concerned about mercury being placed in the new landfill. DOE and the regulators (the State & EPA) need to agree on how much mercury the landfill can hold without increasing risks for people who fish downstream.
6. To accommodate placement of large waste volumes in an area between streams with groundwater near the land surface, DOE may propose a landfill that includes some underdrains. Tennessee does not allow the use of drainage features (underdrains) beneath landfill waste to lower the groundwater level (water table). Failure of underdrains could make the landfill less stable and allow water to get into the waste. Underdrains also provide routes for any leakage to escape quickly. Either of these problems could cause contamination to flow into streams.
7. It rains a lot in east Tennessee. Tennessee ranks in top five states in the U.S. with 50+ inches of precipitation on average each year. DOE and the regulators (the State & EPA) must agree on how to manage all contaminated water generated by the landfill. This will help protect people downstream during recreational activities, including fishing.

As of October 2018, DOE has not resolved the important issues listed above. Until the State's concerns have been resolved, the State cannot approve the landfill as currently proposed.

Regardless of whether this proposed plan is agreed upon and approved, DOE will continue to send radioactive and hazardous waste to approved facilities in other states, mostly in the western U.S. Waste exceeding onsite disposal limits needs to be disposed offsite. Sending more waste offsite may cost more money in the short term, but there are tradeoffs with cost and risk. We believe a solution can be found that balances costs and risks and keeps cleanup moving forward.

The State will continue working with DOE to find solutions to the proposed plan issues identified above. The State encourages residents to provide comments to DOE on this important decision.

Due Date for Public Comments:

Public comments regarding the proposed plan can be submitted to the Department of Energy. No comments should be submitted to the State for the official administrative record related to the Proposed Plan. These comments must be submitted to DOE by December 10, 2018 and can be emailed to John.Japp@orem.doe.gov or mailed to: Mr. John Michael Japp, P.O. Box 2001, Oak Ridge, TN, 37831.

DOE has scheduled a meeting to hear public comments at 6 p.m. on **November 7**, 2018 at the Y-12 New Hope Center, 602 Scarboro Road. You are invited to that meeting to hear more about DOE's proposed plan and share your views about the proposed action.

Contacts for Further Information:

Public Comments: John Michael Japp
 P.O. Box 2001
 Oak Ridge, TN, 37831
 John.Japp@orem.doe.gov

State Position: Brad Stephenson
 865-220-6587
 Brad.Stephenson@tn.gov

Key CERLCA documents: <https://tinyurl.com/emdf2018>

Table 2. Estimated costs for disposal alternatives

Cost element	\$ million					
	East Bear Creek Valley	Central Bear Creek Valley	West Bear Creek Valley			Offsite
			Dual site	Hybrid		
Capital cost (construction, operation, to closure)	733.6	732.0	750.4	928.0	1,391	1,567 to 1,799
Long-term maintenance ^a	45.7	45.7	46.1	74.4	34.3	NA
Present worth ^b	538.3	537.2	553.3	667.4	1,145	1,315 to 1,494

^aLong-term maintenance includes 100 years of maintenance, monitoring, and surveillance.

^bPresent worth calculations use a discount rate of 1.5% per the Office of Management and Budget (OMB 2016).

STATE ACCEPTANCE

The State of Tennessee recognizes the importance of selecting a waste disposal option to support environmental cleanup and building demolition on the Oak Ridge Reservation (ORR) by the U.S. Department of Energy. The State also supports identification of Central Bear Creek Valley Site 7c as the most promising disposal location on the ORR. A key reason the State supports evaluation of Site 7c is its potential to provide a reasonable disposal capacity without relying on underdrains for collecting and discharging groundwater under the facility. DOE is collecting information at the site to evaluate this assumption.

To be clear, the State would not support a disposal facility that has a drainage feature (underdrain) to suppress the water table. In addition, current information about conditions at the site indicates the proposed landfill would need limits on the types and volumes of waste to protect human health and the environment. Waste exceeding onsite disposal limits would need to be disposed of offsite.

The State did not approve the remedial investigation/feasibility study report that serves as the primary basis for this Proposed Plan. The State documented concerns about protecting human health and the environment throughout the CERCLA process leading to this Proposed Plan. On May 22, 2017, DOE initiated a formal dispute under the *Federal Facility Agreement for the Oak Ridge Reservation* to move the CERCLA process forward to this Proposed Plan. The State, EPA and DOE signed a Dispute Resolution Agreement on December 7, 2017. As part of the Dispute Resolution Agreement, the three parties agreed to give their best efforts to work jointly to issue this Proposed Plan identifying Central Bear

Creek Valley Site 7c as the preferred location for EMDF. The Dispute Resolution Agreement outlines a general path for meeting CERCLA requirements.

It is the State’s opinion that outstanding issues should be resolved before a ROD selects onsite disposal as the preferred alternative. Until then, the State is unable to approve the preferred alternative. To be clear, a preferred *alternative* is not the same as a preferred *location*. The preferred alternative presented in this Proposed Plan includes assumptions about the volumes and types of waste, as well as natural conditions at Central Bear Creek Valley Site 7c.

The following discussion summarizes the State’s key concerns.

- 1) Site characterization (detailed description) – During March and April, 2018, DOE collected data on hydrologic conditions underlying the proposed Central Bear Creek Valley Site 7c disposal site during the “wet” season (winter/spring), consistent with the attached Field Sampling Plan. DOE submitted a “Pre-published Technical Memorandum #1” summarizing the data. Preliminary review of Technical Memorandum #1 indicates the conceptual design of the EMDF presented in the draft RI/FS reports and this Proposed Plan may need revision to accommodate the new information on site hydrology.

DOE will collect additional data before the ROD to characterize conditions during the “dry” season (summer/fall). DOE will place the data in the Administrative Record. If this information changes understanding of the site’s suitability, the new information would be documented consistent with the NCP at 40 CFR 300.430(f)(3)(ii), including possible

issuance of a revised Proposed Plan. Provided the FFA parties determine the EMDF can be built, operated, and closed in a manner that is protective of human health and the environment and complies with ARARs, a ROD for the EMDF would be signed consistent with CERCLA and the NCP.

- 2) ARAR identification – CERCLA requires the ROD to include a final list of ARARs. It is the State’s position that, at a minimum, ARARs will include State and Federal statutes, rules, and regulations identified in RI/FS Appendix G attached to the Dispute Resolution Agreement. As stated in this Proposed Plan, DOE may request CERCLA waivers and/or exemptions under the State radioactive waste disposal rules and waivers under the Toxic Substances Control Act (TSCA) for the following requirements, as allowed by the regulations.

- The hydrogeologic unit used for disposal shall not discharge ground water to the surface within the disposal site. [TDEC 0400-20-11-.17(1)(h)]
- The landfill site shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping. [TSCA 40 CFR 761.75(b)(5)]
- The bottom of the landfill shall be above the historical high groundwater.... There shall be no hydraulic connection between the site and standing or flowing surface water.... The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table. [TSCA 40 CFR 761.75(b)(3)]

The State intends to review exemption and waiver requests pursuant to statutory and regulatory requirements and the State’s site-specific understanding, including characterization data, projections of waste proposed for disposal (i.e., volumes, types, and characteristics), and the conceptual dimensions for a waste disposal unit at Central Bear Creek Valley Site 7c.

- 3) Waste acceptance criteria –TDEC wants to make sure that the proposed landfill would be sufficiently protective for Tennessee residents. One way to protect human health

over the long term is to limit what may be placed in the landfill. Limits are determined through modeling various scenarios that represent where and how people may be exposed to materials released from the landfill in the future. Even though the landfill would be engineered and constructed to specific standards, it would still be affected by natural processes such as erosion, settling, and root penetration over time. Given that some radionuclides to be placed in the landfill would remain dangerous for thousands of years and longer, analytical WAC will be developed to limit what can go into the landfill.

The Dispute Resolution Agreement provides for the State’s independent verification of DOE modeling. State acceptance of the preferred alternative relies heavily on the State’s ability to complete the independent verification based on information provided by DOE. The State will consider site-specific data, assumptions, and exposure scenarios in evaluating whether the WAC support an onsite disposal alternative that meets CERCLA requirements, remedial action objectives in this Proposed Plan, and performance objectives in Tennessee radiological health rule 0400-20-11-.16. The State will evaluate potential toxic effects of uranium in addition to potential cancer risk.

- 4) DOE assessments – DOE Orders require an assessment of the performance of the proposed disposal facility for radionuclides. This includes the Performance Assessment (PA), Composite Analysis (CA), and Preliminary Disposal Authorization Statement (PDAS). The State contends these DOE documents should be in the Administrative Record because the State will rely on them when evaluating the protectiveness of the preferred alternative during remedy selection under CERCLA.
- 5) Mercury disposal – Mercury contamination at the Y-12 National Security Complex (Y-12) is currently the greatest known environmental risk on the ORR (DOE 2017b). DOE plans to demolish parts of Y-12, including the West End Mercury Area (WEMA) buildings. The State is concerned about disposal of mercury-containing waste from that effort because of its potential release into Bear Creek and threat to people who eat fish caught downstream.

Fish in Bear Creek and downstream in East Fork Poplar Creek already contain mercury. Both streams are posted by the State to prevent fish consumption. The State is concerned that disposal of large volumes of mercury-contaminated waste in EMDF could further degrade Bear Creek, East Fork Poplar Creek, Poplar Creek and the Clinch River. Therefore, the State expects that DOE will limit or manage mercury disposal to provide reasonable assurance that the amount of mercury released in the future will not violate the intent of the Tennessee Water Quality Control Act (TWQA) or adversely impact people fishing and eating fish downstream.

- 6) Use of underdrains – Tennessee operational practice does not allow drainage features to permanently suppress the water table to mitigate springs or streams at proposed landfill sites. This is consistent with Tennessee rules [for example, TDEC Rules 0400-11-01-.04(3), 0400-11-01-.04(4)(a)(2), 0400-20-11-.16(5), and 0400-20-11-.17(1)(h)]. It is the State's position that selecting a disposal alternative that requires an underdrain would require (1) exemptions or waivers from Tennessee Division of Radiological Health and TSCA requirements and (2) a convincing demonstration that use of underdrain(s) would protect human health and the environment.
- 7) Discharge limits – Consistent with the Dispute Resolution Agreement, it is the State's position that discharge limits for disposal of facility wastewater should be consistent with CERCLA and established in the ROD. The State considers it important for a future onsite disposal facility to protect downstream surface water users who eat fish and comply with the Tennessee Water Quality Control Act and regulations.

CERCLA requires DOE, as the lead agency, to provide an opportunity for local governments and members of the public to offer input to help ensure selection of the most acceptable alternative. CERCLA also requires DOE to incorporate meaningful citizen input into making the decision. After DOE collects additional data, the State may request another public meeting if evaluation of the data changes the State's understanding of conditions at the Central Bear Creek Valley Site 7c.

DOE as the lead agency has provided responses to these key concerns and issues, as contemplated by the CERLCA process, below.

U.S. DEPARTMENT OF ENERGY RESPONSE TO STATE ACCEPTANCE

The DOE believes that the Central Bear Creek Valley site can be used for construction of a fully protective disposal facility of sufficient size to support completion of planned Oak Ridge Reservation cleanup activities. DOE believes site characterization activities completed to date indicate that with proper site development and facility design, the proposed facility can safely isolate disposed wastes from the environment.

DOE agrees with the State that remediation of mercury residuals remaining at the Y-12 site is a priority for the Oak Ridge cleanup program. While the vast majority of the mercury retrieved during site remediation will be isolated and stored for off-site disposal, some residual levels of mercury associated with building rubble, soils and drained equipment are proposed for onsite disposal. It is important to recognize this contamination is currently proximate to ground and surface water resources, and in a largely uncontrolled setting. The objective of the onsite disposal proposal is to remove contamination from this setting and place it in an engineered facility that eliminates ongoing environmental impacts.

The need for underdrains at the proposed facility will be evaluated further during design activities, should a decision be made to proceed with facility design and construction. Based on available data, DOE predicts no permanent underdrain should be required; however, it is possible that a temporary drainage feature may be required under lateral earthen berms associated with the facility. If needed, these drainage features would not be located under areas of waste placement. Use of underdrains at disposal facilities is an engineering approach employed by multiple disposal facilities in the East Tennessee region as a means of enhancing landfill stability and performance.

NEPA VALUES

There are no NEPA values to evaluate for the No Action Alternative as the future waste disposal decisions are unknown and would be addressed for NEPA compliance as appropriate.

NEPA values were evaluated for the disposal alternatives. Those values associated