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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

August 16, 2018

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. John Michael Japp
Federal Facility Agreement Manager
Oak Ridge Office for Environmental Management
Department of Energy
P.O. Box 2001
Oak Ridge, TN 37831

Dear Mr. Japp:

The U.S. Department of Energy (DOE) requested the U.S. Environmental Protection Agency conduct a review of the July 2018 "pre-published" *Technical Memorandum-1* report (TM-1). This document presents results of a recently completed geological/hydrological characterization assessment of the Bear Creek Valley Site 7c location for the proposed Environmental Management Disposal Facility.

This site-specific characterization work was directed under the Dispute Resolution Agreement (DRA - December 2017) for the *Remedial Investigation/Feasibility Study (RI/FS) for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Waste Disposal for Oak Ridge Reservation Waste Disposal Oak Ridge, Tennessee* (DOE/OR/01-2535):

> (DRA-Resolution 3) "The results and analysis of the field investigation in accordance with the FSP shall be included in the administrative record and the Proposed Plan public comment period shall be provided thereafter. This field investigation, and EPA/TDEC's review of the results thereof, shall be conducted prior to execution of the Record of Decision (ROD) and shall be used in selecting the remedy." (EPA underline added)

The EPA has reviewed the comments on the TM-1 provided by the Tennessee Department of Environment and Conservation and supports those comments. In addition, the EPA offers comments on this document to achieve a mutually agreeable revised TM-1 document. However, the EPA reserves the right (per DRA Resolution 3 above) to make further comment on the TM-1 report (and TM-2 report) as additional information is made available to the EPA - before any ROD might be signed.

The information presented in TM-1 indicates that the groundwater elevation over much of the site is higher than predicted in the Field Sampling Plan (FSP) (see FSP Figure 5). In addition, due to the late wet season start in groundwater data collection for TM-1, EPA notes that that this sampling occurred during what could generally be described as the "drier" two months of the "wet season" and, that the data

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should, therefore, be interpreted in a more conservative manner. This means that the highest actual wet season groundwater elevations at the various monitoring well locations across Site 7c are likely higher than the March-April-May 2018 reported levels. Both of these pieces of information are related to certain applicable or relevant and appropriate siting requirements (ARARs), waste cell/control berm design, and possibly near-surface water management issues across portions of Site 7c. Further, since the RI/FS conceptual design of the landfill was developed before acquiring the new groundwater data, the conceptual design and its compliance with ARARs should be reconsidered taking into account the new data. DOE should ensure that all the data that has been collected is taken into account before the submittal of waiver requests in the D1 Record of Decision.

If you have any questions or concerns regarding this matter or need any additional information, then please contact me at (404) 562-8550, and electronically at froede.carl@epa.gov.

Sincerely,

Carl Froede Jr.

Carl R. Froede Jr., P.G.
Senior Remedial Project Manager
Restoration and DOE Coordination Section
Superfund Division

cc: Brian Henry, DOE
Patricia Halsey, DOE
Michael Higgins, TDEC
Randy Young, TDEC
Howard Crabtree, TDEC
Brad Stephenson, TDEC
Andy Binford, TDEC
Amy Fitzgerald, City of Oak Ridge
SSAB

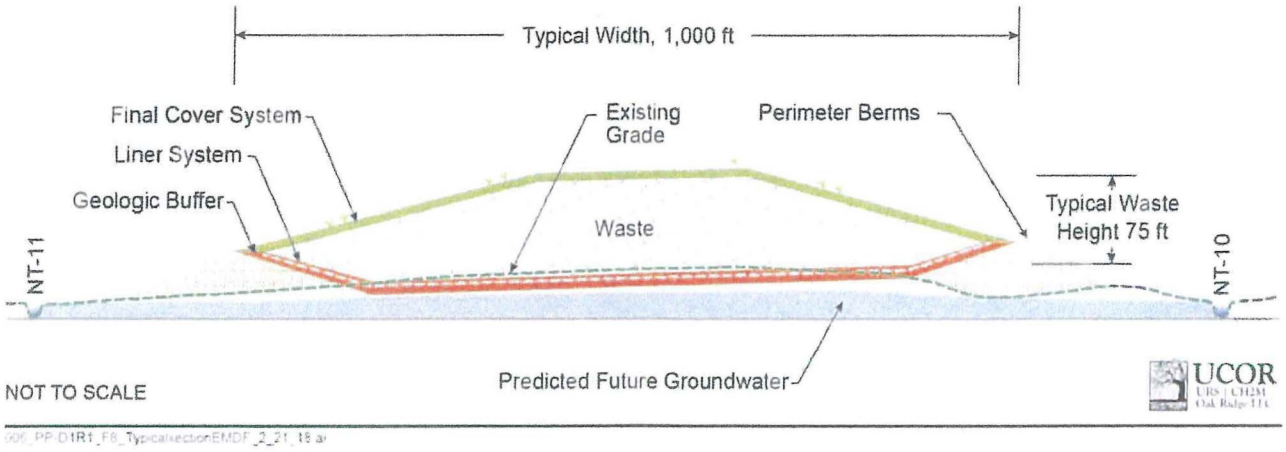
EPA Comments on Technical Memorandum #1, Environmental Management Disposal Facility Phase 1 Field Sampling Results, Oak Ridge, Tennessee

GENERAL COMMENTS

1. **Conceptual Site Suitability** – Interest in the Bear Creek Valley, Site 7c location is based on several factors presented in the EMDF D5 RI/FS Report. One of the most important issues is the location of the groundwater table beneath the site:

> a. "…the water table is assumed to remain below the geologic buffer material at all locations (i.e. the thickness of the unsaturated buffer zone is everywhere ≥ 15 ft)…" (RI/FS, p. 7-7).
>
> b. "More importantly, leaks …must penetrate at least 15 ft or more of low permeability clay liner and geobuffer materials and native low permeability materials in the unsaturated zone before reaching the water table…" (RI/FS, p. 6-42).
>
> c. "Because these sites are not constructed over stream valleys, an additional key assumption is that the final design will not require permanent underdrains beneath the waste to maintain sufficient buffer zone thickness." (RI/FS, p. 7-7).

These concepts are presented graphically in Figure 6-7 (RI/FS, p. 6-32) and in Figure 8 of the Proposed Plan (p. 11 – see below)



The TM-1 Report, Section 8 - VALIDATION OF KEY ASSUMPTIONS states:

> "Groundwater levels measured in both deep and shallow piezometers during the Phase 1 characterization confirmed that prior to landfill construction, groundwater discharges as seeps in the valleys and drainages, and mirroring topography, is higher beneath knolls/ridges with the elevation beneath the largest knoll in the site lower below ground surface than predicted in the RI/FS. Groundwater levels show responses to rainfall events and downward gradients beneath the knoll, indicating minor recharge is occurring on the site."

"Results of the Phase 1 site characterization validate the key assumptions regarding the hydrogeologic setting (groundwater and surface water conditions) at the site. The results confirm the acceptability of the CBCV site for a new, low-level waste landfill and support final site selection."

EPA Comment: TM-1, Section 6.3 FINDINGS (p. 6-7): The report suggests that groundwater level is highly variable and elevational data from Table 6.3 appears to indicate the water table may be higher than predicted by the original site conceptual model (i.e., ≥ 15 ft beneath the ground surface). For purposes of informing the public, the DOE should modify "Figure 8" in the Proposed Plan to reflect expected consistency with TM-1 data and state that modifications to the original site conceptual model based on the additional collection of site characterization data (i.e., TM-1 and TM-2) may require design changes that will be conveyed (should Site 7c be selected) in the Remedial Design Report/Remedial Action Workplan. The conclusions conveyed in TM-1 (above) seem to be overly optimistic and do not mention the need to modify the original conceptual model that the groundwater table surface will be ≥ 15 ft beneath the ground surface.

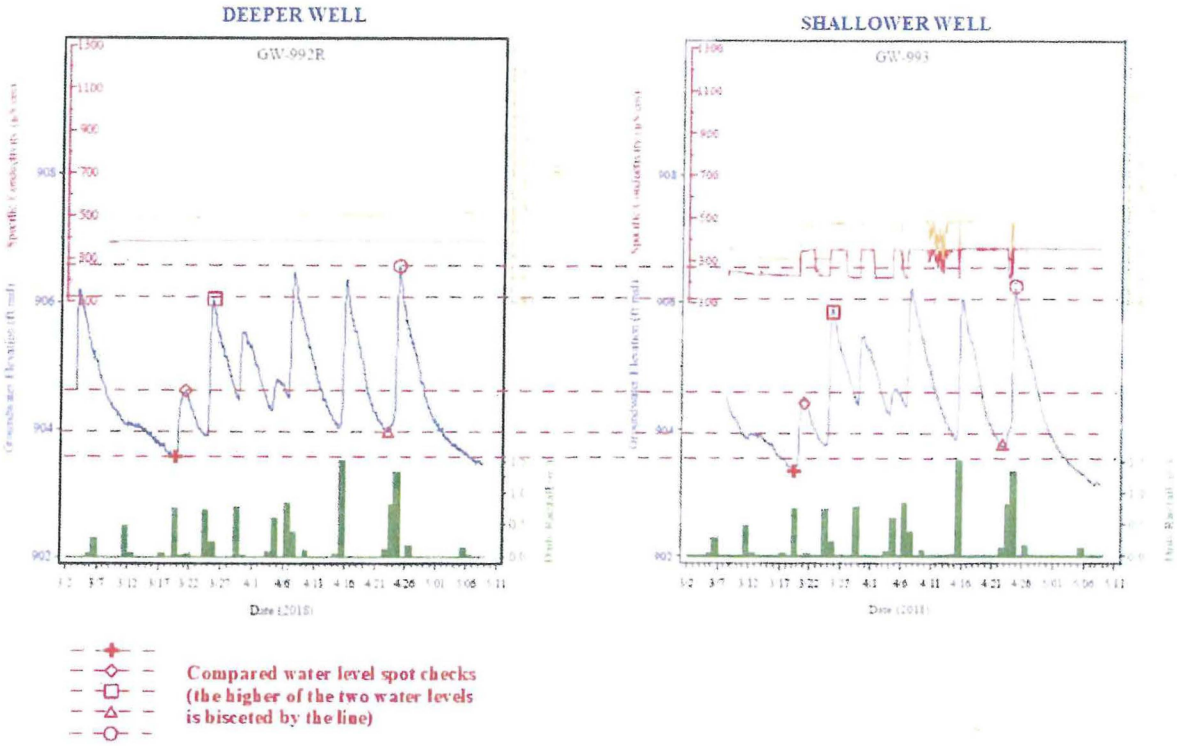
SPECIFIC COMMENTS

1. Section 6.3.4 explains the procedure that was used to extrapolate water levels at the piezometers for the earlier part of the wet season, before the piezometers were installed. The procedure seems reasonable. The Section 6.3.4 text states "Groundwater elevation data for an appropriate BCV well were matched to the groundwater elevation data for a given EMDF well to help predict the wet season data for that well to date, during this calendar year." There is no means to independently evaluate the degree to which the selected wells in other parts of BCV are a good match for the EMDF. There should be documentation in the Tech Memo that shows the relevant data from the selected wells that were considered to demonstrate a reasonable match to the EMDF wells. Graphical water levels from each well in other parts of BCV that were matched with each EMDF well need to be included, along with some indication of the geographic, topographic, and stratigraphic location of the other BCV wells, for comparison to the associated EMDF wells.

2. Table 6.4 presents "Vertical gradient direction, Spring 2018" values for each of the eight shallower/deeper well pairs. There is obviously some basis for developing an overall average based on the limited-duration data set. The means of reaching the overall Table 6.4 conclusion needs to be described in the Tech Memo. For the GW-992R/GW-993 and GW-982/GW-983 well pairs, Table 6.4 indicates there is no overall vertical gradient direction. A series of spot checks of Figure 6.6 and Figure 6.9 (figures showing the water levels for these well pairs) indicates that at numerous times over the early-March to early May period of water level monitoring of this well, the deeper of the GW-992R/GW-993 wells had a higher water level than the shallower well (see Figure 1 below) while at GW-982 and GW-983, the shallower well typically had the higher water level (see Figure 2 below). These water-level relationships are consistent with the overall conceptual model of groundwater flow (downward vertical gradient component in upslope recharge areas; upward vertical component in downgradient discharge areas). The conclusions reached should be better explained within the context of the seasonality of changing water levels in these wells. As presented the conclusions are misleading. Correct to reflect the varying nature of the wells by adding another column (or two) indicating a different time and a different hydraulic gradient.

2. Continued

Figure 1. Spot Check Comparisons of GW-992R and GW-993 Water Levels



base illustration: Tech Memo Figure 6.9

3. Table 7.1 presents geotechnical data with individual samples from a boring identified as "SS-1," "SS-5," et cetera. Presumably the numbers refer to sample depth. If that interpretation is correct, the table footnotes should indicate the numbers refer to sample depths.

4. Table 7.1 shows that at individual borings, numerous samples were collected but other than the moisture content of individual samples, most of the samples were not tested for texture or other geotechnical indices. The Section 7.1 text should include discussion of the rationale that went into selection of specific samples at each boring for the more comprehensive geotechnical testing.

(End of Comments)