DOE-19-0165

I-02033-0422

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE, TENNESSEE 37243-0435

DAVID W. SALYERS, P.E.
COMMISSIONER

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April 5, 2019

Mr. John A. Mullis, Manager
Oak Ridge Office of Environmental Management
U.S. Department of Energy
Post Office Box 2001
Oak Ridge, Tennessee 37831-8540

Ms. Mary S. Walker
Acting Regional Administrator, Region 4
U.S. Environmental Protection Agency
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-8960

**Re: State of Tennessee Position in the Formal Dispute Initiated by the U.S. Environmental Protection Agency on August 24, 2018, on the *Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-2664&D2)**

Dear Mr. Mullis and Ms. Walker:

The Tennessee Department of Environment and Conservation (TDEC) supports the position established by the U.S. Environmental Protection Agency (EPA) Region 4 in the ongoing dispute on the *Focused Feasibility Study [FFS] for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee* (DOE/OR/01-2664&D2). The Region 4 position is documented in a letter dated March 21, 2019 from Mary Walker, Acting Regional Administrator. The dispute concerns the establishment of protective limits for landfill wastewater that the U.S. Department of Energy (DOE) discharges from the Environmental Management Waste Management Facility (EMWMF) and intends to discharge from the proposed Environmental Management Disposal Facility (EMDF).

Pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR), TDEC invoked the enclosed informal dispute on the FFS on March 31, 2016, followed by EPA Region 4 on April 1, 2016. After failure of efforts by the project team and Dispute Resolution Committee (DRC) to resolve the dispute, EPA Region 4 formally elevated the dispute to the Senior Executive Committee (SEC) for resolution on August 24, 2018. The SEC efforts to resolve the dispute were also unsuccessful. The EPA Region 4 letter dated March 21, 2019 asserts that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP), and the FFA provide EPA with the authority to make the final decision necessary to resolve the dispute. DOE or TDEC may issue a written notice elevating the dispute to the Administrator of EPA for resolution within 21 days of the March 21, 2019 letter.

TDEC supports the position established by EPA Region 4 because it is consistent with one of the State of Tennessee's key concerns documented in the *Proposed Plan for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee (DOE/OR/01-2695&D2/R1)*. As stated in the Proposed Plan, discharge limits for disposal of landfill wastewater should be consistent with CERCLA and established in the Record of Decision (ROD) for the EMDF, a proposed mixed-waste landfill.

This dispute should be resolved before a ROD authorizes onsite disposal. It is important for a future onsite disposal facility in Oak Ridge to comply with the Tennessee Water Quality Control Act and State regulations as well as protect downstream surface water users who eat fish sourced from these waters. Specifically, the State supports EPA Region 4's position that DOE must revise the D2 FFS to include additional protective requirements. The ROD must include protective discharge limits for landfill wastewater that are consistent with the requirements in the EPA position letter. Once this issue and the State's other key concerns are resolved, TDEC may request that DOE host another public meeting to provide the local community with an opportunity to have informed input into the decision, as required by CERCLA.

Finally, the DOE must establish protective discharge limits consistent with these requirements in the ROD for the existing mixed-waste landfill, the EMWMF. After EPA and TDEC approval of the FFS, DOE will need to revise this Record of Decision consistent with the resolution of the FFS dispute and the NCP. DOE submitted an ESD (DOE/OR/01-2322&D1) on August 29, 2017. That submittal was premature given that neither EPA nor TDEC had approved the FFS. As shown in the enclosed letter dated October 25, 2017, TDEC did not approve the ESD, pending resolution of the issues associated with the disputed FFS.

Please direct any questions or comments regarding this letter to Randy Young at (865) 220-6584.

Sincerely,

David W. Salyers, P.E.
Commissioner

Enclosures

cc: Andrew R. Wheeler, EPA
Connie Jones, EPA
Pat Halsey, DOE
Amy Fitzgerald, ORRCA
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DOE-16-0157

I-02033-0245

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF REMEDIATION - DOE OVERSIGHT OFFICE
761 EMORY VALLEY ROAD
OAK RIDGE, TN 37830

March 31, 2016

Mr. John Michael Japp
DOE FFA Project Manager
P.O. Box 2001
Oak Ridge TN 37831-8540

Dear Mr. Japp

**RE: Focused Feasibility Study [FFS] for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee (DOE/OR/01-2664&D2)**

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation has reviewed the above referenced document pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation. Based on that review, the state cannot approve the FFS at this time and places this document in informal dispute. TDEC has the following comments on the submittal.

1. The FFS does not convincingly demonstrate that alternative 2, as described, will meet the CERCLA threshold criteria. On page 33 in the description of alternative 2, the document states: *"Landfill wastewater initially is discharged to Bear Creek in accordance with current discharge limits (Table 6) and points of compliance. Subsequently, landfill wastewater is treated at LWTS, located at the proposed, adjacent EMDF site prior to discharge to Bear Creek in accordance with revised discharge limits (Table 6)."*

As illustrated in Figure 5 (page 8) and the data presented in the FFS, contact water drains/emerges from solid/hazardous waste and contains contaminants derived from that waste. Consequently, contact water meets the state and federal definitions of leachate cited in the TDEC General Comment 3 and in the FFS at the top of page 8. That is: *"TDEC 0400-11-01 defines leachate as "a liquid that has passed through or emerged from solid waste and contains soluble, suspended, or miscible materials removed from such waste." RCRA (40 CFR 260.10) defines leachate as "any liquid, including any suspended components in the liquid that has percolated through or drained from hazardous waste."* Currently, contact water/leachate is released to drain through an unlined ditch to mix with clean stormwater in the sediment basin, prior to radioactive contaminants being assessed for compliance with the limits in Table 6. The Department of Energy (DOE) has proposed to do the same with leachate collected by the leachate collection system. The practice allows contact water/leachate to be released to the environment and diluted with clean stormwater prior to the compliance evaluation.

TDEC does not agree to the continued use of the outfall from the sediment basin as point of compliance for radiological contaminants in contact water/leachate and has found no formal approval of the current point of compliance in a primary CERCLA or FFA document. The current point of compliance allows mixing of point source wastewater contaminated with radiological constituents with non-point source uncontaminated stormwater runoff prior to meeting the limits for discharge.

Dilution of point source wastewaters with uncontaminated runoff is inconsistent with TDEC permitting practice. The current policy of dilution and discharge without treatment may also conflict with the TDEC prohibition on permitting the discharge of radioactive wastewater in Tennessee Rule 0400-40-05-.04, paragraph (1), subparagraph (b). Compliance limits established post-dilution with non-point source runoff complicate verification, and create a potential for conflicts in operational priorities. The practice of batch discharge during storms enables the release of more contaminated wastewater, but discourages releases between storms that might maximize the use of water storage capabilities.

**2.** The document fails to establish whether the proposed limits for managed discharge in Table 6 (page 35), or the proposed future discharge limits for radiological contaminants at an on-site wastewater treatment plant, will be protective of human health and the environment. The proposed discharge limits for treated wastewater in Table 6 should meet the Tennessee numeric water quality criteria, as well as narrative criteria and the Anti-degradation Statement, identified in Appendix D of the document as applicable requirements. However, the limits for managed discharge may not be sufficiently stringent to comply with the requirements of the Anti-degradation Statement, should a measurable additional loading of mercury, cadmium, or PCBs in wastewater result from changes in landfill operations.

The assumption of unchanging chemical characteristics in the Environmental Management Waste Management Facility (EMWMF) wastewater was made for the purposes of this document, but should mercury concentrations in landfill wastewater rise, or if the quantity of landfill wastewater discharged to Bear Creek increase, treatment, either onsite or offsite must be provided to remain in compliance with anti-degradation requirements. For comparison purposes, the current loading should be computed using the actual average values of the contaminant concentrations in the wastewater discharge to date, not the current batch discharge limits for the ponds, as in Table K-5 (page K-9) of the document.

**3.** TDEC generally agrees with the sampling approach that is described briefly in Appendix L of the document. This approach results in a significant reduction in the number of analytes used to determine compliance of landfill wastewater discharged to Bear Creek through either managed discharge or treatment. TDEC also supports the use of process knowledge, use of general water quality parameters as indicators, and use of periodic sampling of more mobile compounds and isotopes to add new key contaminants of concern (COCs) to the list. However,

TDEC will need to evaluate in more detail all potential risks to human health and the environment before concurring with the list given in Table L.1, or with the specific methodology for adding new COCs. These issues should be resolved and details added to this Appendix rather than deferring almost all the specifics to the sampling and analysis plan.

**4.** TDEC has conducted a preliminary assessment of risks incurred through a fish ingestion pathway by a recreational user in the reach of Bear Creek including Bear Creek Kilometer (BCK) 9.2. Based on dilution with a stream discharge corresponding to the 30Q5 at BCK 9.2 as calculated with USGS regression equations or from data and default values for the exposure scenario and bioaccumulation factors for radionuclides, more restrictive limits on at least some of the seven radioactive isotopes evaluated by DOE in this FFS may be necessary to ensure protection of human health and the environment. TDEC considered additional radionuclides present in landfill wastewater in our analysis, including carbon-14, chlorine-36, and radium isotopes. Computed risks suggest that more restrictive limits than those proposed in this FFS may be appropriate for a number of these additional isotopes. A more thorough description of TDEC's analysis of discharge limits that might be imposed by risk due to fish ingestion, including permissible loading of radionuclide releases to Bear Creek, is given below.

1) Appendix K derives "Revised Discharge Limits for Landfill Wastewater." We agree that discharge limits are needed for radiological constituents and that promulgated Tennessee Water Quality Criteria are Applicable or Relative and Appropriate Requirements for the EMWMF/EMDF water treatment system, including, and not limited to, recreational use criteria.

2) Figure K-1 (page K-4) indicates that the land use downstream of BCK 9.2 is classified over the short term for recreational use and long term for unrestricted use. Recreational use includes the capture and subsequent consumption of fish and shellfish. Page 4-47 of the 2015 Remediation Effectiveness Report (RER) states that *"the lower stretches of Bear Creek are often impounded due to beaver dams which create the deeper pools suitable for rock bass habitat..."* The RER also states that *"the upper stretches of Bear Creek are less suitable for rock bass, and the sunfish species most often encountered in the stretch of Bear Creek between BCK 4.6 and BCK 9.9 is the redbreast sunfish..."* TDEC is preparing to post Bear Creek for fish consumption due to levels of mercury and PCBs in fish. Appendix K, Page K-16 speculates that it is plausible that fish caught at alternate locations may be consumed. With sunfish in upstream Bear Creek areas and rock bass in downstream Bear Creek areas, it is also plausible that fish from upper and lower Bear Creek are all that would be consumed. TDEC's analysis utilized default assumptions for resident fish consumption from EPA's Preliminary Remedial Goals for Radionuclides (PRG) website and values from the "Resident Fish Table."

3) TDEC's analysis of recreational use and fish consumption utilizes bioaccumulation factors (BAF) available from Argonne National Laboratory's RESRAD Offsite documentation. These bioaccumulation factors do not always agree with BAFs given in Table K-11. For example, Table K-11 lists the BAF for strontium-90 of 2.9 L/kg and uranium-238 of 0.96 L/kg. RESRAD Offsite documentation lists BAFs for strontium isotopes of 60 L/kg and uranium isotopes of 10 L/kg. These differences in BAFs will result in at least an order of magnitude difference in discharge criteria. The source for BAFs used in Appendix K is not clear.

4) TDEC rule 0400-40-03-.03(4) specifies that when determining levels appropriate for recreational use, a "10-5 risk level is used for all carcinogenic pollutants."

5) Table K.12 titled "Total recreational risk-based discharge limits" contains 7 radioisotopes plus uranium as a soluble salt. Table H-13 for the "*Remedial Investigation/Feasibility Study for Comprehensive Environmental Response, Compensation, and Liability Act; Oak Ridge Reservation Waste Disposal; Oak Ridge, Tennessee*" (Waste Disposal RI/FS) dated 3/11/2016 includes about 62 radionuclides in the waste stream. Bioaccumulation factors are available for all but one or two of these radionuclides. Waste Disposal RI/FS, Appendix H, Attachment A, Table 2-2 also includes a number of additional radionuclides that were considered and not modeled for the Waste Disposal RI/FS. Discharge limits based on capture and subsequent consumption of fish (reactional use) should be derived for all constituents in the proposed waste stream that bioaccumulate or bioconcentrate in the fish and that may pose greater than a 10-6 excess cancer risk.

6) Po-210 is in the U-238 decay chain and previous RESRAD modeling indicated Po-210, if present, may pose a threat from fish consumption at extremely low levels. A discharge level for Po-210 should be developed.

7) For determining allowable releases of radionuclides to Bear Creek for recreational use, Tennessee Rule 0400-40-03-.05(4) requires that the basis of stream flows is equal to or exceeding the 30 day minimum 5 year recurrence interval. BCK 9.2 is located near the location where land use is designated as recreational and is in the reach the 2015 RER documents fish. Using USGS stream stats and USGS site 03538270 (BCK 4.55) scaled for watershed size (watershed at BCK 9.2 is 0.38 the size of the watershed at BCK 4.55), a 30 day five year flow on the order of 238 to 272 liters per minute is estimated. Minimum 30 day flow measured by DOE at BCK 9.2 in the past 10 years was 311 liters per minute in October 2007.

8) Radionuclides are already present in Bear Creek surface water. For example, the average concentration measured at BCK 9.2 October 2006 through September 2015 and presented in RER data for U-238 is 17 (95% UCL of 17.5) pCi/L; U-235/236 is 0.77 (95% UCL of 0.8); and U-233/234 is 8 (95% UCL of 8.2) pCi/L. The mass of radionuclides already in the stream has to be taken into account when determining discharge criteria.

9) We have not identified radionuclide sampling and analysis at BCK 9.2 for many of the radionuclides that may be in the EMWMF/EMDF waste stream. If there are insufficient sampling and analysis of radiological constituents in Bear Creek surface water to determine concentrations present in Bear Creek water without the wastewater treatment plant discharge, a sampling and analysis plan should be performed to determine existing levels of radionuclides in Bear Creek surface water. Until this is performed, the discharge concentration should be the concentration that causes a 10-5 target risk. For example, until strontium-90 data is obtained for BCK 9.2, the interim discharge limit for strontium-90 should be on the order of 5 pCi/liter. Once current conditions are determined, remaining capacity and resulting discharge limits may be calculated.

10) The following table incorporates the above comments into table for a few radionuclides. This assumes a 30 day minimum 5 year recurrence interval flow of 311 liters per minute and a discharge rate of 113 liters per minute (30 gpm).

| Nuclide COPC | Fish BCF (pCi/kg) /(pCi/L) RESRAD Offsite | Ingestion of Fish TR=1E-5 (pCi/kg) | pCi/L to cause TR 1E-5 from fish ingestion | BCK 9.2 flow | Average and 95%UCL Concentration (pCi/L) at BCK 9.2 (Oct 2010-Sept 2015 - RER data) | Average pCi/minute load/flux measured at BCK9.2 October 2006 through September 2015 | BCK9.2 pCi/min load to cause TR=1E-5 | Remaining capacity at BCK9.2 in pCi/min | Assuming 30 gpm (113 L/min) discharge rate, discharge limit in pCi/L based on downstream fish consumption |
|---|---|---|---|---|---|---|---|---|---|
| C-14 | 5.00E+04 | 1.00E+04 | 0.2 | 311 | Not Analyzed | | 62.2 | | 0.2 |
| Cl-36 | 1.00E+03 | 4.60E+03 | 4.6 | 311 | Not Analyzed | | 1430.6 | | 4.6 |
| Co-60 | 3.00E+02 | 9.10E+02 | 3.0 | 311 | Not Analyzed | | 943.4 | | 3.0 |
| Cs-135 | 2.00E+03 | 2.60E+03 | 1.3 | 311 | Not Analyzed | | 404.3 | | 1.3 |
| Cs-137 | 2.00E+03 | 5.40E+02 | 0.3 | 311 | Not Analyzed | | 84.0 | | 0.3 |
| H-3 | 1.00E+00 | 3.10E+05 | 310000.0 | 311 | Not Analyzed | | 9.64E+07 | | 3.1E+05 |
| I-129 | 4.00E+01 | 1.00E+02 | 2.5 | 311 | Not Analyzed | | 777.5 | | 2.5 |
| K-40 | 1.00E+03 | 6.00E+02 | 0.6 | 311 | Not Analyzed | | 186.6 | | 0.6 |
| Ra-226 | 5.00E+01 | 4.00E+01 | 0.8 | 311 | Not Analyzed | | 248.8 | | 0.8 |
| Ra-228 | 5.00E+01 | 1.40E+01 | 0.3 | 311 | Not Analyzed | | 87.1 | | 0.3 |
| Sr-90 | 6.00E+01 | 3.00E+02 | 5.0 | 311 | Not Analyzed | | 1555.0 | | 5.0 |
| Tc-99 | 2.00E+01 | 5.10E+03 | 255.0 | 311 | Not Analyzed | | 79305.0 | | 255.0 |
| Th-229 | 1.00E+02 | 7.00E+01 | 0.7 | 311 | Not Analyzed | | 217.7 | | 0.7 |
| Th-230 | 1.00E+02 | 1.70E+02 | 1.7 | 311 | Not Analyzed | | 528.7 | | 1.7 |
| Th-232 | 1.00E+02 | 1.50E+02 | 1.5 | 311 | Not Analyzed | | 466.5 | | 1.5 |
| U-233/234 | 1.00E+01 | 2.10E+02 | 21.0 | 311 | 8 (95%UCL=8.2) | 2488 | 6531.0 | 4,043 | 36 |
| U-235/236 | 1.00E+01 | 2.20E+02 | 22.0 | 311 | 0.77 (95% UCL=0.8) | 239.47 | 6842.0 | 6,603 | 58 |
| U-238 | 1.00E+01 | 2.40E+02 | 24.0 | 311 | 17 (95%UCL=17.5) | 5287 | 7464.0 | 2,177 | 19 |
| Po 210 | 1.00E+02 | 9.00E+00 | 0.1 | 311 | Not Analyzed | | 28.0 | | 0.1 |

Questions or comments concerning the contents of this letter should be directed to Howard Crabtree at the above address or by phone at (865) 220-6571.

Sincerely

Randy Young, FFA Manager
Environmental Restoration Program

xc Patricia Halsey, DOE
Jeff Crane, EPA
Brian Henry, DOE

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Remediation - Oak Ridge
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October 25, 2017

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

Dear Mr. Japp

**Explanation of Significant Differences for the Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee (DOE/OR/01-2322&D1)**

The Tennessee Department of Environment and Conservation (TDEC), Division of Remediation Oak Ridge Office (DoR-ORO), has reviewed the above referenced submittal pursuant to the Federal Facility Agreement (FFA) for the Oak Ridge Reservation (ORR). The subject document is not approved pending resolution of the issues associated with the *Focused Feasibility Study (FFS) for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation.*

**Background**

Over the history of the Environmental Management Waste Management Facility (EMWMF) operations, effective water management has been a challenge at the site. In 2014, the FFA parties agreed to evaluate options for the management of leachate and contact water for CERCLA waste disposed on the ORR at both the EMWMF and the proposed Environmental Management Disposal Facility (EMDF). In July 2015, Department of Energy (DOE) submitted the initial version of the *Focused Feasibility Study (FFS) for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation (DOE/OR/01-2664&D1).* The tri-parties followed the FFA comment and comment response process with a D2 FFS being submitted to EPA and TDEC in February 2016. TDEC was not satisfied DOE had addressed comments regarding water management,

ARAR's, and discharge limits. Therefore, TDEC's comment letter on the D2 FFS (the latest letter by TDEC on the FFS dated March 31, 2016) placed the document in informal dispute. Issues concerning ARAR's and discharge limits are still unresolved. The FFS has not been finalized nor has an alternate path forward been established.

**Current Status**

In a letter dated July 14, 2017, DOE submitted an extension request on the subject ESD for water management to both EPA and TDEC. The request acknowledged the need *"to resolve issues associated with radiological discharge limits and ARAR's"* and further went on to describe the strategy of continuing communication of project status with the project team and schedule meetings to discuss the radiological discharge limits. Because of TDEC's position that adequate progress has not been made to resolve the issues associated with the FFS that were identified on both the D1 and D2 drafts of the FFS in FY16, TDEC denied DOE's extension request (letter dated July 31, 2017) by citing the failure of DOE's proposed strategy in reaching comment resolution. Instead, the TDEC letter stated that the extension request would be re-evaluated when *"a more detailed project implementation strategy is developed"* and a definitive schedule is incorporated into the extension request for resolution of unresolved issues. In lieu of modifying the request for extension as suggested by TDEC, DOE submitted the D1 ESD to EPA and TDEC on August 31, 2017. Again, because the supporting FFS is a prerequisite for the subject ESD, progress must be made to finalize the study.

**Related Issues**

On August 8, 2017, TDEC submitted to DOE an audit report to document findings and recommendations regarding DOE Waste Lot 301.4. TDEC's concerns again centered around potential discharges of landfill wastewater to Bear Creek. WL 301.4 contained material from the West End Mercury Area (WEMA) at Y-12 and was disposed at the EMWMF on September 29, 2016.

The audit was initiated to determine whether DOE addressed mercury-bearing waste in accordance with restrictions stated in TDEC's letter dated June 13, 2016. Specifically, that letter restricted mercury-bearing waste disposal in the EMWMF until DOE provides assurance it will not discharge landfill wastewater to Bear Creek with a mercury concentration that exceeds the 51-nanograms-per-liter (ng/L) recreational ambient water quality criterion (AWQC) for organisms in TDEC Rule 0400-40-03-.03(4).

After receiving TDEC's audit report, DOE's Oak Ridge Office of Environmental Management (OREM) questioned whether DOE had discharged wastewater from EMWMF with mercury concentrations above the 51-ng/L limit. TDEC evaluated data available in OREIS as a follow-up to DOE's inquiry but notes that 2017 data for EMWMF

contact water, leachate, underdrain, and the sediment pond are not available yet. Furthermore, much of the data in OREIS for 2014 and before is unusable to determine whether the discharge affected mercury concentrations in fish downstream due to detection limits. Detection limits for mercury for the sediment pond and underdrain were above 51 ng/L during 2015 and 2016. Even with the detection limit issues, discharges greater than 51 ng/L have been detected in contact water. Specifically, mercury concentrations exceeded the limit for 9.0% (7) of the 78 usable contact water results (including 2 filtered samples), as follows.

| DATE | SAMPLE | FILTERED | RESULT (ng/L) |
|---|---|---|---|
| 12-16-2008 | EMWCW1237 | No | 150J |
| 12-29-2008 | EMWCW1257 | No | 69J |
| 01-08-2009 | EMWCW1277 | No | 61J |
| 07-14-2014 | EMWCW4886 | YES | 59.3 |
| 08-13-2014 | EMWCW4922 | YES | 72 |
| 04-08-2015 | EMWCW5162 | No | 134 |
| 04-16-2015 | EMWCW5173 | No | 60.9 |

Partially due to the identification of issues in the FFS, the FFA parties are engaged in an ongoing effort to improve the Sampling and Analysis Plan (SAP) for the EMWMF detection monitoring program. It is TDEC's expectation that implementation of the revised SAP will produce data of sufficient quality, including adequate detection limits, to support meaningful evaluation of landfill wastewater discharges. As part of the landfill wastewater discharge evaluation, future annual Phased Construction Completion Reports (PCCRs) for EMWMF would evaluate wastewater discharge for compliance with all Bear Creek designated uses specified in TDEC rule 0400-40-04-.09. Irrespective of whether the waste lot in question released mercury to Bear Creek, TDEC asserts the importance of having processes in place to prevent future releases of mercury to Bear Creek.

Bear Creek and downstream surface water are classified for recreation (e.g. fishing and fish consumption) and other uses and impaired water quality in Bear Creek is not a new issue. Bear Creek continues to be included on TDEC's Division of Water Resources 2017 proposed final year 2016 303(d) list due to mercury and other pollutants. Figure 4.14 of the 2015 Oak Ridge Department of Energy Remediation Effectiveness Report, shown below, graphically represents mercury concentrations in fish (Rockbass at BCK 3.3 and Redbreast at BCK 9.9) downstream of EMWMF in Bear Creek over time. HCK 20.6 is a background reach used for comparing mercury concentrations in Rockbass.

This graph indicates something changed after 2009 causing an increase in concentrations of mercury in downstream Rockbass. The data show that four of eleven samples (36%) collected since 2009 are greater than or equal to the highest levels observed since 1990. This trend is disturbing in light of the fact that DOE proposes to construct another disposal facility in Bear Creek Valley that would potentially receive additional mercury bearing waste from demolition of facilities in the West End Mercury Area (WEMA) at Y-12.

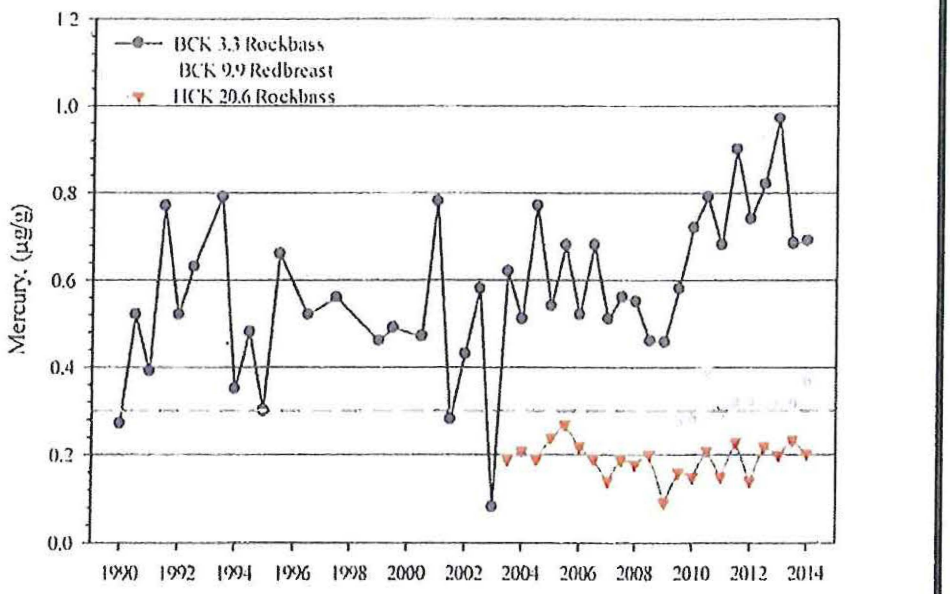


**Figure 4.14. Mean concentrations of mercury in rockbass from BCK 3.3, redbreast sunfish from BCK 9.9, and rockbass from the Hinds Creek reference site (HCK 20.6) 1990 – 2014.**

Dashed line indicates EPA recommended AWQC for mercury (0.3 µg/g in fish)

The FFS supporting the subject ESD, associated meetings, and several TDEC comment letters dealt with the topic of mercury pollution in Bear Creek. Resolution of the informal dispute regarding the FFS for water management at EMWMF and the proposed EMDF will result in modifications of the EMWMF Record of Decision (ROD) which should document the necessary processes for ensured protection of Bear Creek and more effective management of landfill water.

Further, on March 22, 2016, DOE Oak Ridge Environmental Management provided answers to the Oak Ridge City Council and Mayor on waste disposal in Bear Creek Valley and options for additional waste disposal. During that question and answer period, Mayor Gooch asked if DOE intended to dispose of mercury in Bear Creek Valley. DOE responded that disposal of mercury would be done in accordance with land disposal restrictions (LDRs), and DOE will not dispose of mercury in a manner which allows the mercury to leach. The City wanted public input regarding how mercury waste is addressed, and DOE discussed the application of a CERCLA decision process with public comment.

To demonstrate the seriousness of the commitment made on March 22, 2016 to the City of Oak Ridge, DOE must provide assurance the landfill will not discharge landfill wastewater to Bear Creek with a mercury concentration that exceeds the 51-nanograms-per-liter (ng/L). The commitment must show that DOE does not intend to build a treatment plant at OF 200 to reduce mercury pollution in East Fork Poplar Creek at Y-12 only to move material further down the valley and possibly release mercury to the surface waters of Bear Creek.

Path Forward

TDEC will not be issuing specific comments on the subject ESD at this time because of the unresolved issues of the disputed FFS that will likely result in changes to the ESD. Given that mercury has been and may be continuing to be discharged above allowable limits and mercury accumulation in fish from Bear Creek shows an increasing trend as opposed to decreasing, it is TDEC's position that DOE develop the following:

1) A detailed schedule for resolution of issues associated with water management at the EMWMF and proposed EMDF; and

2) Discharge limits for chemical and radiological contaminants that are consistent with CERCLA, DOE Orders and ARARs; and

3) A plan to identify and correct discharges of mercury above allowable limits.

The mercury discharge issue discussed above, along with other EMWMF water management issues previously identified by TDEC (e.g. valve closures, water levels, detection monitoring, etc.) are symptomatic as to the need of DOE to develop a comprehensive water management strategy for EMWMF and other proposed disposal and cleanup actions on the DOE ORR. TDEC encourages DOE to schedule meetings with the FFA parties to begin resolution of the issues associated with the incomplete FFS.

Questions or comments concerning the contents of this letter should be directed to Howard Crabtree at (865) 220-6571.

Sincerely

Randy C. Young,
FFA Manager

xc Jon Richards, EPA
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