UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

SEP 1 3 2019

Mr. Paul V. Rosasco
Project Coordinator
Engineering Management Support, Inc.
25923 Gateway Drive
Golden, Colorado 80401

Dear Mr. Rosasco:

On August 2, 2019, and August 5, 2019, Parsons, on behalf of the West Lake OU-1 Respondents, submitted the Remedial Design Work Plan, West Lake Landfill Superfund Site Operable Unit 1, or the RDWP, and the Design Criteria Report, West Lake Landfill Superfund Site Operable Unit 1, or the DCR, to the U.S. Environmental Protection Agency. These two documents were prepared and submitted to fulfill Sections 3.1 and 3.2 of the May 6, 2019 Remedial Design Statement of Work, Operable Unit 1, West Lake Landfill Superfund Site, or RD SOW.

The EPA has completed its review of these two documents and is disapproving both of them as submitted. Please revise the documents in accordance with the enclosed comments and re-submit them within 30 days of receipt of this letter, as required in Section 5.6(b) of the RD SOW. A meeting has been scheduled on September 19, 2019 at the EPA Region 7 Offices to discuss these comments.

The EPA recognizes, based on the Airport's comments about the timeframe required for the one-year wildlife hazard assessment and associated documents, that it may be necessary to modify the deliverables schedule in the RD SOW for the Wildlife Hazard Mitigation Plan. A final Wildlife Hazard Mitigation Plan that is acceptable to the Airport must be received by the EPA

prior to approval of the final RD document. Please submit a proposal for a revised schedule with the revised documents requested above.

Please feel free to contact me with any questions or concerns by phone at (913) 551-7141 or by email at jump.chris@epa.gov.

Sincerely,

Christine R. Jump
Remedial Project Manager
Site Remediation Branch
Superfund and Emergency Management Division

Enclosure

cc: Mr. Ryan Seabaugh, MDNR

U.S. EPA Comments on the August 2019 Remedial Design Work Plan, Operable Unit 1 West Lake Superfund Site, Bridgeton, Missouri

General Comments:

1. Reference within which RD deliverable any evaluation, conclusion or additional information mentioned in this RDWP will be presented.

2. Any ARAR, criteria, threshold or other requirement mentioned in this RDWP should be specified in the DCR. If the details of this information cannot be determined at this point in the process, state which document the information will be presented in when it is known.

3. The RD and RA must be prepared to implement the RODA. There are several processes or elements in this RDWP that, as proposed, vary from the descriptions in the RODA. Identify those elements where they are proposed and, if there is technical rationale, state the basis for the proposed variance, and how it will meet or exceed the same standards or objectives intended in the RODA. Any evaluations or assessments needed to support these potential modifications need to be identified in the RDWP and/or the DCR and any ARARs, criteria or standards associated with these elements need to be included in the DCR or state specifically which deliverable or when the detailed information will be presented to EPA.

4. Interaction with OU-2: There are state-permitted areas within OU-1 Areas 1 and 2 such as Permits #218903, 118906, and potentially 118912. The RDWP should include a discussion on how the OU-1 Remedial Design (RD) will conform to the permit requirements for these areas and/or indicate which permit requirements will be waived.

5. The RDWP contains statements in various sections indicating that groundwater will be addressed as part of OU-3. Remove all statements to that effect from this document (and the DCR) and instead address OU-1 groundwater performance monitoring in OU-1 remedial design documents in accordance with the ROD amendment, ARARs, and remedial design statement of work. In order to perform the groundwater evaluation as required by the RODA, a baseline of the groundwater quality and contaminant concentrations associated with OU-1 before the Remedial Action, and contaminant concentrations during and after Remedial Action must be determined. Work to determine the baseline groundwater conditions will be required during the RD. The RD WP must specifically discuss how baseline groundwater quality, prior to implementation of the RA, will be established for OU-1 and generally discuss how groundwater performance monitoring will be conducted for OU-1.

Specific Comments

6. Executive Summary, page ES-1, 1st paragraph. Revise the last sentence of this paragraph by adding the following language at the end, "including protection of groundwater by limiting infiltration and thus leaching of contaminants."

7. Executive Summary, page ES-1, 1st bulleted list, 4th bullet. Delete the parenthetical phrase *(through OU-3)* from this bullet and also throughout the document.

8. Executive Summary, page ES-1, 5th paragraph. Delete "using expedited investigations and design of the critical path components."

9. Section 1.1 Site History, pages 1-1 to 1-2.
    a. Revise the second sentence by adding the phrase, "*brought to the landfill and,*" so that the sentence reads, "Parts of the site were radiologically contaminated when soil mixed with leached barium sulfate residues (LBSR) was brought to the landfill and reportedly used as cover for landfilling operations…".

    b. Relocate the reference to the 2018 Baseline Risk Assessment to the last paragraph of the section. Add to the list of recent activities performed since the 2008 ROD the major investigations and documents completed such as the additional characterization investigation in Area 1 and Area 2, the Remedial Investigation Addendum, the Updated Baseline Risk Assessment, and the Final Feasibility.

10. Section 1.2 Remedy of Record–2018 Selected Amended Remedy, page 1-2.
    a. Revise the text in this section above the bulleted list to read, "The Amended Remedy selected in the RODA (USEPA 2018) addresses the portions of the West Lake Landfill that are contaminated with radiologically impacted soils and landfilled waste through a combination of excavation and placement of an engineered cover."

    b. Revise the bullets in this section to use language identical to that used on page 3 of Part I of the September 27, 2018 OU-1 ROD Amendment, or RODA, and clarify the source of the bullets and any references within them (i.e. The reference to Section 12 in the second bullet is to the RODA, not the RDWP, as indicated).

11. Section 1.3.2 Updated RAOs for Buffer Zone and Lot 2A2 of OU-1, page 1-3. Add the following sentence before the last sentence of this section, "The EPA determined the radiologically impacted soils on Lot 2A2 and parts of the Buffer Zone should be remediated to background levels." Also, revise the last sentence in this section by replacing the current words "needs to" with the word "will".

12. Section 1.4 Overview of RDWP, page 1-3. The bulleted language in this section appears to be taken directly from Section 3.1 of the RD SOW, but it is not clear why the information is organized differently. It is not clear where the information related to each bullet is presented or addressed in this RDWP. Revise the document to clearly identify where each of these required elements of the RPWP are presented or addressed in this document.

13. Section 1.4.1 RDWP Organization, page 1-4. This section and the previous section (1.4 overview of the RDWP) should be integrated to clearly document how the requirements of the RD SOW will be achieved in the RD process and presented in this workplan.

14. Section 2 Investigations, pages 2-1 and 2-2. An additional sub-section should be added to this section discussing investigation and evaluation of the seep located on Area 2.

15. Section 2.2 Proposed Design Investigations, pages 2-1 and 2-2. A putrescible waste investigation is not addressed in this workplan and an additional subsection should be added for this purpose. Characterization of the waste and its attractiveness to wildlife will be key to the Wildlife Hazard Mitigation Plan. It will also be important in evaluating other aspects of the design, such as evaluating air quality and odor control issues, protocol for draining or de-watering excavated materials, and requirements for cover of stockpiled materials and open excavations. EPA and the Airport recommend that this evaluation be conducted during or prior to the Design Investigation field work in order to have the data necessary for development of other design deliverables including the Wildlife Hazard Mitigation Plan, or WHMP and the 30% RD.

16. Section 2.2.1 RIM Investigations, page 2-1.
    a. While this section generally describes the approach to RIM investigations that will be conducted during the RD, the section must be expanded to include a summary of the objectives of the Design Investigation provided in the RD SOW which include, boundary confirmation of Areas 1 and 2, evaluating potential historical impacts to drainage areas and the northwest surface water body; and collecting additional data to support the optimization efforts required in the RODA.

    b. The RD SOW requires the RD Workplan to include preliminary descriptions of the additional data needed to complete the RD. The text provided is essentially a paraphrasing of the RODA and RD SOW and does not provide additional information about the additional data needs. Expand this section to discuss, at a minimum, the general areas where additional investigation is anticipated, and where additional information on this topic will be presented in future submittals.

    c. The Respondents' proposal to characterize RIM through sampling during the design investigation such that field screening and sampling can be significantly reduced or eliminated during and after any excavation varies from the description of the amended remedy on page 66 of the RODA which states, "A combination of radiological field screening and analytical sampling techniques will be used during the RIM excavation process." The criteria that would guide this pre-excavation approach to confirmation sampling have not been provided to EPA at this time. As discussed during a meeting on June 13, 2019 and a subsequent conference call, additional information is required before EPA can fully consider this method for approval, including examples of other sites where this method has been used effectively; a discussion of the criteria to be used for proposing lateral and vertical distribution of confirmation samples; the rationale for how this approach could achieve the objectives in the RODA; and an evaluation of various methods for confirmation sampling and the pros and cons of each that would provide a justification for the most appropriate confirmation sampling methodology. EPA also notes that field screening techniques may be useful for a variety of remedial action activities including excavation confirmation, managing and loading of RIM for off-

site disposal, and characterizing backfill that may include RIM near the 52.9 pCi/g concentration. Include in this section of the workplan which RD deliverables will include the information described in this comment and any necessary evaluations.

d. This section contains a statement about background measurements generally comprising a range of values, particularly for naturally occurring mineral elements but does not discuss how this issue will be addressed during background sampling. Revise this section to generally discuss the approach that will be used to develop statistically valid background values or include this information in the DCR (see comment 60 below).

e. In the first sentence of the fourth paragraph, delete "off-site". Include a general discussion of the timing for initiating these access agreements.

17. Section 2.2.2 Geotechnical Investigation, pages 2-1 to 2-3.
    a. This section does not include any specifics as to the types of information or data that will need to be collected during the geotechnical investigations, the scope of these geotechnical investigations or the timing of these geotechnical investigations, and must be expanded to include this information. State specifically where and when the detail regarding this investigation will be provided to EPA.

    b. Page 2-2 indicates that geotechnical investigation may also be performed if a source is identified for borrow soils. Include discussion of the geotechnical investigation and selection criteria that meets or exceeds ARARs for borrow soils being used for closure of OU-1.

18. Section 2.2.3 Utilities, page 2-2. Provide a relative timeframe for when this work will be performed and where the results or the need for additional investigation will be documented.

19. Section 2.2.4 Surveys, page 2-2. Provide a general or relative timeframe for when this work will be performed and where it will be documented and submitted. Also discuss how and when the 2005 topographic surface will be identified and documented. Additional detail about the criteria and requirements for the survey, such as the extent and degree of accuracy, must be included in the DCR.

20. Section 2.3 Data Quality Assurance, page 2-2. Clarify what is meant by the first sentence in this section, "Standard quality assurance and quality control procedures will be applied during the RD process." These "standard procedures" must be documented in a Quality Assurance Project Plan, or QAPP. This section states there will be a QAPP and Field Sampling Plan, or FSP, for the design investigations; however, it is not clear whether the design investigation QAPP is also intended to function as the RD QAPP. Provide additional discussion as to what information and procedures will be included in the QAPP.

21. Section 3.0 Remedial Design Process.
    a. In general, this section needs to integrate the RD SOW requirements documented in Sections 3.1.1 and 3.1.2 with the activities listed in Sections 3.3 through 3.7.

b. See general comment 3 above.

c. Where an activity or process in this workplan indicates that there are specifications, ARARs, or other criteria affecting their evaluation or implementation, cite the specific section in the DCR that identifies and discusses that criteria.

d. Specify which plans are anticipated to need final adjustments by the RA contractor.

22. Section 3.1, Remedial Design Submittals, pages 3-1 to 3-8.
    a. General - In addition to stating the requirements for each submittal, this workplan should demonstrate a thorough evaluation of the RD process by clearly documenting the activities and relative timeframe for each activity that must occur in order to achieve the milestones represented by each deliverable.

    b. Section 3.1.1.2 Preliminary Excavation Plan, page 3-1. The section indicates that the Preliminary Excavation Plan and drawings will be based on the 2017 3D Extent of RIM Report or an alternative model approved by EPA. Revise this section by indicating which model will be used to produce the Preliminary Excavation Plan and which RD deliverable will propose the modeling approach for the Revised Excavation Plan. List the calculations that will be used for determining excavation criteria such as RIM activities and waste volumes in table 4. Also include a discussion of any other items or actions that will be considered in the Preliminary Excavation Plan (e.g. the site survey, and 2005 topographic surface) in this section. The general approach or methods for the calculation of these criteria should be proposed in the DCR so that this information can be reviewed by EPA prior to submittal of the Preliminary Excavation Plan.

    c. Section 3.1.1.4 Design Investigation Work Plan, page 3-2.
        i. The Airport commented that greater detail is required in order to determine if the current Wildlife Mitigation Plan would be sufficient for the work being proposed including:
            1. Description of excavation and sampling processes;
            2. Sample testing: purpose of test and type of tests being performed; (relates directly to characterization of the putrescible waste products);
            3. Excavation locations and depths;
            4. Quantity of waste that will be disturbed; and
            5. Storage and disposal of waste.

        The EPA acknowledges this information should be provided in the Design Investigation Workplan, or DIWP. This document is anticipated to be submitted in the spring of 2020 and it is expected to take 60 to 75 days to revise and finalize the DIWP after submittal of the draft document. It is not clear whether this provides sufficient time for the Airport to evaluate the information in the workplan and, if necessary, revise the existing Wildlife Mitigation Plan prior to the start of the investigation.

The Airport and Respondents must work together to resolve these issues so that there is no delay in implementing the investigation due to wildlife mitigation concerns. The final DIWP will require a Wildlife Mitigation Plan attached as an appendix and a statement indicating that the attached plan satisfies the requirements of the Airport.

ii. The Airport requests that the Respondents verify that implementation of the work proposed in the DIWP is the only portion of the work proposed in the RDWP that involves disturbance of putrescible waste. Also, add a statement in this section, or elsewhere as appropriate in the RDWP, that if the Respondents identify a need in the future to disturb putrescible waste during the RD process outside of the Design Investigation work, they will notify the Airport and EPA as soon as possible and coordinate with the Airport as necessary to resolve any wildlife mitigation concerns.

d. Section 3.1.1.4 Design Investigation Work Plan, page 3-2.
   i. Additional background characterization must be conducted for each radiological COC listed in the RODA unless a specific justification can be made that another radionuclide can act as a surrogate for one or more radiological COC's. Revise the bullet as follows "Additional background characterization to determine statistically valid background levels for the radiological COC's that may be present in the Buffer Zone and Lot 2A2;".

   ii. In bullet (a)(4), delete the rest of the sentence after the words "boundaries of Area 1 and Area 2."

   iii. Confirmation sampling is discussed in section 2.2.1 and is proposed to be collected during the RD. If this additional data is to be obtained during the design investigation, then it should be listed here. See comment 16.c.

   iv. Clarify whether the geotechnical investigation will be proposed in the DIWP.

   v. Add a putrescible waste evaluation and investigation of the Area 2 seep to the DIWP or state where they will be proposed and when they will be conducted.

e. Section 3.1.1.6 Revised Excavation Plan, Page 3-3. Insert "below the 2005 topographic surface" after "Isolated pockets between 8 and 12 feet" in (b) (1) to be consistent with language in section 3.1.1.2 Preliminary Excavation Plan. Similarly, revise the language in (b) (2).

f. Sections 3.1.2.1 Emergency Response Plan and 3.1.2.2 Site Management Plan, page 3-4. For completeness, add a description of these plans in the corresponding sections.

g. Section 3.1.2.3 Health and Safety Plan, page 3-4. HASP revisions during the RD, RA and post-RA activities shall be submitted to EPA.

h. Section 3.1.2.5 Quality Assurance Project Plan, pages 3-4 to 3-5. The Quality Assurance Project Plan or QAPP should also include data quality requirements for other RD/RA data collection processes such as surveying, measurement of compaction or permeability, or other data needs.

i. Section 3.1.2.6 Site-wide Monitoring Plan, page 3-6. Revise the paragraph discussing ground water monitoring to indicate that in accordance with Footnote 1 to RD SOW Paragraph 5.7(f)(1), a groundwater monitoring program will be developed as a part of the RD and this program will be used to support evaluation of the OU-1 remedy's performance. The RODA states, "The groundwater monitoring program will include routine sampling and analysis of groundwater, as well as statistical evaluations of groundwater data to assess groundwater quality and identify trends." In accordance with the RD SOW, groundwater monitoring that will occur during or after the remedial action will be developed in the Site-wide Monitoring Plan, or SWMP. If data from the OU-3 remedial investigation is intended to support this effort, the specific goals and requirements of that effort must be clearly documented in this section. As indicated in comment 6.c. of the August 27, 2019 comment letter on the Site Management Plan, a groundwater quality baseline must be established during the RD prior to implementing the performance monitoring required in the RODA. Any specific coordination needs, and relative timing based on anticipated milestones for the OU-3 should be assessed and discussed in the OU-1 RDWP.

j. Section 3.1.2.8 Construction Quality Assurance/Quality Control Plan (CQAP/CQCP), page 3-6. Delete the second to last sentence in the first paragraph which begins, "in general, the CQAP will be...".

k. Section 3.1.2.10 Wildlife Hazard Mitigation Plan, page 3-7. This section of the RD Workplan must include discussion of coordination activities between the various entities that will be reviewing and ultimately making the determination that the Wildlife Hazard Mitigation Plan, or WHMP is acceptable for use during the RA. This section must also include discussion of the one-year wildlife hazard assessment required for development of the WHMP.

   The WHMP must be sensitive to inputs that can only be obtained from a wildlife hazard assessment and the Airport has provided the following information regarding the one-year assessment:

   1. The product will need to conform to Federal Aviation Administration (FAA) expectations – as outlined by advisory circular.
   2. The radius for the assessment would extend five miles from the landfill site.
   3. The time line to prepare a full assessment and prepare the WHMP may be as long as 24 months, as follows:
      a. 6 months for preparation, review and Airport acceptance of the consultant's scope of work, which includes coordination with U.S. Department of Agriculture and FAA.
      b. 12 months for consultant assessment investigation.

c. 6 months to finalize and submit a Wildlife Hazard Assessment Report and a Wildlife Hazard Mitigation Plan for RA. Review and coordination of the information with federal agencies and Airport acceptance are required.

The RD SOW and the schedule in Table 6 of this document require the WHMP to be submitted within 90 days of EPA approval of the Design Investigation Work Plan. Based on the time frame provided by the Airport, it appears that the schedule associated with the WHMP needs to be adjusted to account for the deliverables required by the Airport. EPA is willing to adjust the requirement for submittal of the WHMP to coincide with submittal of the 90% RD document; however, based on the currently projected RD schedule, a Scope of Work for the one-year wildlife hazard assessment needs to be submitted to the airport as soon as possible in order to meet that timeframe.

As stated in comment 15 above, a putrescible waste attractiveness evaluation also needs to be conducted to help evaluate wildlife mitigation hazards and to help with other design factors such as daily and intermediary cover needs.

l. Section 3.1.2.13 Institutional Controls Implementation and Assurance Plan, page 3-8. Add a reference to the Final Feasibility Study (FFS) discussed in this section.

m. Section 3.1.2.14 Other Plans, page 3-8. The first sentence in the paragraph is not a complete sentence and should be revised or deleted.

23. Section 3.2, page 3-9. This section appears to be essentially a duplication of section 3.1.1.1 and EPA recommends combining the two sections.

24. Section 3.3 Site Preparation and Controls, page 3-9.
    a. Identify the specific RD document(s) that will include the detailed information concerning the bulleted actions. If certain actions listed here are required in order to complete a document or move to the next step, identify the relative timeframes these actions need to be completed in.

    b. There is no discussion of decontamination in this RDWP. Include identification of a location and necessary provisions for vehicle/equipment decontamination and washing in this section. The threshold criteria for decontamination should be included in the DCR.

    c. The sixth bullet in the section states that temporary stormwater and erosion control measures will be designed in accordance with federal, state, and local storm, detention, and erosion control requirements. The DCR should cite the specific requirements that the design of the temporary measures must meet.

d. Add a bullet to address identification and negotiation of any land access needs (private land, city right-of-way for sampling, site access, staging or maneuvering materials and equipment.)

25. Section 3.4.1 Excavation Design, page 3-10.

a. Revise the first bullet to read: "Defining total activity criteria per 12.2.1 of the RODA for Areas 1 and 2 that will be used to develop the targeted excavation locations for optimization which deviate from the general excavation depth of 12 feet below the 2005 surface that will be presented in the preliminary excavation plan;"

b. Revise the second bullet as follows, "Defining statistically valid background levels for radiological COC's in the Buffer Zone and Lot 2A2 for use in identifying the presence and extent of radiologically-impacted soil in these areas;". See Comment 22. d.i. for related information. In addition, include

c. Revise the third bullet to take the following comments into consideration: The third bullet states that the methodology used to calculate total radioactivity could include "volumetric and/or indicator Kriging". Calculating total radioactivity using multiple methods is acceptable if used as part of an evaluation, however, one singular method must ultimately be selected and used in the final excavation plan to determine the total radioactivity criteria.

This bullet also states that the updated 3D geostatistical model will be used to evaluate 2D field survey units of up to 2,000 square meters. EPA notes that the RODA states on page 65, "The final boundaries of excavation will be confirmed through a combination of field screening and sampling within survey units no larger than 2,000 square meters." It is not clear how the respondents intend to use the geostatistical model to approach confirmation sampling. EPA requests that the details of the approach be provided as soon as possible in the RD process to prevent impacts to the schedule. (See comment 63 on section 5.3 of the DCR)

This bullet also states that the respondents intend to use indicator Kriging in order to use both field and laboratory data in the modeling. EPA has previously provided comments to the 3D Geostat report related to this topic that should be considered. (for example, see EPA's approval letter for the December 22, 2017 3D Extent of RIM Report - https://semspub.epa.gov/work/07/30352118.pdf)

The last sentence in the 3rd bullet of this section states, *"The deep RIM materials are used in defining the final cover boundary in Areas 1 and 2 but that does not require a geostatistical analysis"*. It is not clear how the terms "deep RIM materials" and "upper portions of the landfill" will be defined. EPA notes that RIM is defined for the Site as combined radium or combined thorium equal to or greater than 7.9 pCi/g. The unexcavated RIM extent present at any depth will be considered when defining the final cover boundary and therefore the approach to sampling should be systematic to ensure the data are accurate, reproducible and defensible. Replace this statement with

discussion of the process and criteria that will be used to determine final cover extent and include the criteria in the DCR.

d. The 6th bullet in this section states that the intent of the additional investigations and geostatistical modeling is to define the limits of RIM to the extent that no confirmation sampling is needed during the RA. The degree to which this approach can be used has not yet been evaluated or approved. Revise the 6th bullet to identify requirements or criteria for confirmation sampling that can achieve the requirements in the RODA. Also, see comment 16.c.

e. Add a bullet with provisions for removal and stockpiling of overburden and/or setback.

26. Section 3.4.2 Backfilling of Excavations, page 3-11. Consideration should be given to whether different types or quality of backfill material will be used in the landfill, the Buffer Zone/Lot 2A2, or in different excavation locations. Include a design item for evaluation of backfill criteria for all excavations.

27. Section 3.4.3 Final Cover Design, page 3-11. Design elements should specifically include consideration of integration challenges for contiguous boundaries between OU1 and OU2. Include remedial design elements for evaluation of cover integration for contiguous boundaries between OU1 and OU2 that also include stormwater management elements.

28. Section 3.4.4 Stormwater Management Design, page 3-12.
    a. The first bullet in this section states that the design storm event will be selected based on RCRA Subtitle D or UMTRCA requirements and the design life of the final cover system. Revise this bullet to also take into consideration the TBC Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments when selecting the design storm event for OU-1.

    b. Include design elements for conveyance and storage that consider contribution or shared volume from adjacent properties and operable units.

    c. The design for temporary or permanent stormwater management must address standing water, which can be a wildlife or bird attractant.

    d. State which deliverable(s) will included the information listed in the bullets in this Section.

29. Section 3.5 Materials Handling, Transportation, and Disposal, page 3-12. Significant consideration and evaluation of the need for a RIM staging and loading building was performed in the Final Feasibility Study. Accordingly, the RODA describes that RIM to be removed from the Site will be managed in such a building. The first statement in the fifth bullet should be revised to state, "Evaluating factors to consider whether the management of excavated materials in an enclosed structure is necessary to comply with ARARs during the excavation and could increase the efficiency of the excavation. See comment 3 above. In the

third sentence, delete, "and resultant smaller volumes of material to be shipped offsite, especially in Area 1," and revise this sentence to read, "...due to the focused nature of the RIM excavation included in the RODA, staging and temporary storage of RIM prior to loading for offsite may not be necessary, especially in Area 1". The factors to be considered in this evaluation should be discussed in the DCR, including processing RIM for transportation and disposal to meet waste acceptance criteria.

30. Section 3.6 Post-RA Flood Protection, page 3-13.
    a. This section states, *"The primary focus of the design will be stability of the closed slopes and the starter berm at the toe of waste slope (if used). Stability analysis will include rapid drawdown analyses."* Describe when this analysis will be developed, and what document or work plan it will be included in for approval.

    b. The statement in italics in 30.a. immediately above implies there is some question as to whether a starter-berm will be used; yet, Section 3.4.3 bullet 4 indicates that the final cover system is anticipated to include a starter berm at the toe of the waste in Areas 1 and 2. If an evaluation is necessary to determine whether a starter berm can be used or not, discuss this issue and the evaluation that will be conducted in Section 3.4.3. (see comment 3 above). ARARs, criteria, or thresholds that will be used in any evaluation of a starter berm should be summarized in the RDWP and presented in detail in the DCR.

    c. This section states the need for erosion protection of the toe of the OU-1 cover will be evaluated and designed if necessary. See comment 3. Revise this section to assume that the toe of the OU-1 cover will include armoring for flood protection due to the longevity requirements for an UMTRCA landfill cover and as presented in the RODA. If an alternative approach is to be evaluated, identify the evaluation that will be performed and the general criteria and thresholds that would be applied. Specific criteria and thresholds should be identified in the DCR.

31. Section 3.7 Environmental & Community Protection & Monitoring During RA, page 3-13.
    a. Several bullets in this section state that the monitoring and mitigation plans for various environmental media will be presented in the RD; however, details of monitoring during the RA for most media will be presented in in the Site-wide Monitoring Plan or SWMP. The text should be revised to reflect this. Also, specific ARARs, criteria, and thresholds mentioned throughout this section should be included in the DCR.

    b. Revise the last bullet on groundwater based on comments 5 and 22.i. above.

32. Section 3.8, page 3-14. Delete the following 2 sentences, "It is likely that a contractor will be selected to execute the RA. The focus on maintaining a short overall project schedule makes integrating multiple construction contracts difficult."

33. Section 4 ARARs and Permits, page 4.1. The second paragraph of this section discusses "overlapping aspects of regulations and guidance" and concludes, "Consequently, the final

cover design will be a hybrid incorporating aspects of the various ARARs." ARARs are requirements that must be met; therefore, the most stringent aspect of overlapping ARARs must be met. In the last sentence of the second paragraph, replace "incorporating aspects of the various ARARs" with "that will meet or exceed ARARs."

34. Section 4.1 Environmental Protection Standards for Uranium and Thorium Mill Tailings, page 4-2. Delete the fourth paragraph and provide provisions for and discussion of longevity evaluations for components of the cover design.

35. Section 4.4 Missouri Solid Waste Rules for Sanitary Landfills, page 4-3.
    a. There are several ARARs which appear to have been inadvertently omitted, including the Missouri Leachate Regulations, and there is no discussion in the RD Workplan as to how the remedial action objective of controlling leachate will be met. Add substantive discussion regarding compliance with the leachate management ARAR and how it will be addressed in the design. Include discussion of the apparent leachate seep in Area 2.

    b. Include the coefficient of permeability requirement, and all other specific Missouri Solid Waste ARARs as they pertain to remedial design.

    c. The third paragraph of this section discusses landfill slope requirements, and the last two sentences state, "The optimal minimal slope for the remedy will be further evaluated during the RD. The maximum sloping requirements will be met at elevations above perimeter or starter toe berms." Delete "at elevations above perimeter or starter toe berms" or describe it in terms of a potential option for development in the RD. Any proposed deviation from the Missouri Solid Waste Rules must be developed and discussed in the RD. Add discussion about how and when the evaluation of optimal or different slopes will be performed and in which deliverable this information will be provided. (See Comment 3).

    d. The third paragraph of this section makes assumptions about the compaction of the refuse and differential settlement but doesn't discuss these assumptions specifically in in relation to the areas of the landfill that will be disturbed or excavated as part of the RA. Add site-specific evaluation of excavation backfill and compaction requirements to ensure valid assumptions on differential settlement are considered.

36. Section 4.6 Clean Water Act, Missouri Stormwater Management Regulations and Drinking Water Standards, page 4-5. Delete the last sentence in the section. See comments 5 and 22.i.

37. Section 5 Remedial Design Management, page 5-1. The introductory sentence of this section indicates that physical security for the West Lake RD will be addressed in this section; however, there is no discussion of physical security. Resolve this discrepancy by adding the indicated information or revising the sentence.

38. Section 5.1.5.4 Analytical Quality Assurance Manager, and Section 5.1.5.5 Project Control Specialist, page 5-3. Include the qualifications for Ms. Kosciewicz and Mr. Ghorai similar to that provided for the personnel in other sections.

39. Section 5.1.6.2 Ameriphysics, page 5-4. In the second sentence of the second paragraph there appears to be missing text. Revise as appropriate.

40. Section 6.2 Site Management Plan, page 6-1. The draft Site Management Plan, or SMP, has been developed and reviewed and it is EPA's understanding that a revised document is under preparation. Please clarify whether the document discussed in this section is a new RA SMP or whether the SMP currently being developed will be updated significantly to incorporate the new information described in this section. If it is to be updated, clearly discuss the updates and additional information that is anticipated to be added to the document and the timing of the updates. Significant updates, such as the addition of an Operations and Maintenance Plan and Manual must be reviewed and approved by EPA. If the SMP discussed in this section is intended to be a separate document, revise the name to clearly differentiate the two documents and discuss the timing for submittal.

41. Section 7 References, page 7-1. The reference "EMSI, Feezor, Auxier, 2019" has not been finalized and cannot be cited before it is submitted. Remove this document from reference list.

42. Table 2. Anticipated Drawings.
    a. Include drawings for gas collection and control systems, in addition to gas monitoring networks.

    b. Include drawings for the 2005 topographic surface and the existing topographic surface

    c. Within the Cover System Details, include drawings specific to joining of cover systems of adjoining operable units.

    d. Specify whether specific drawings will be developed for other deliverables, such as the Preliminary Excavation Plan or the Design Investigation Workplan.

43. Table 3. Anticipated Specifications.
    a. Include specifications for gas collection and control systems.

    b. Include specifications for transportation of waste

    c. Specification for seeding: Ensure specifications include mulch, fertilizer and seed types to be used.

44. Table 4. Anticipated Calculations.
    a. Items listed in the Anticipated Calculations table include plans, RD deliverables, and design elements, in which multiple calculations will be needed to identify criteria or

complete an associated evaluation (e.g. geostatistical model, Removal Design / Excavation Plan, gas management system design). Replace these items with one or more specific calculations that will be performed as part of the RD. The note at the bottom of the table appears to imply that preliminary estimates of all the items in this table will be provided with the 30% design. EPA anticipates that calculations will be performed in the Preliminary Excavation Plan, Design Investigation Work Plan, the Design Investigation Evaluation Report, Final Excavation Work Plan and several of the supporting deliverables. Any anticipated calculations expected for the other design deliverables that will be submitted separate from the 30% design and separate from the 90% design should be added to this table. Then, a second column should be added to the table indicating which RD deliverable each calculation will be presented in.

b. Calculations to develop the Preliminary Excavation Plan, or PEP, should be specified and conceptually presented in the DCR or prior to submittal of the draft PEP.

c. Add temporary storm water calculations to this table

45. Table 5. Remedial Design ARARs.
    a. Chemical-specific ARARs from pages 6 and 7 of 7 in Appendix D-1 of the RODA are missing from Table 5 and at least 3 ARARs are mislabeled as RSMo 260.500-550. (see page 4 of 15, 9 of 15, and 13 of 15). Develop complete and correct ARAR tables.

U.S. EPA Comments on the August 2019 Design Criteria Report, Operable Unit 1 West Lake Superfund Site, Bridgeton, Missouri

General Comments

46. Many of the comments above related to the RDWP are also applicable to the Design Criteria Report, or DCR and should be applied to both documents as appropriate.

47. There are many evaluations, standards, or criteria mentioned in the RDWP that are not carried over into the DCR. Many, but possibly not all, have been identified in the comments on the RDWP.

48. Remove the phrase "to the extent practicable." The purpose of this document is to state the criteria or standards the design or program will be based on. If a situation arises where a waiver to a stated criterion is needed, it can be requested at the time the need is identified.

49. Language regarding the use of structures for managing, handling, or loading RIM, and for temporary water treatment is inconsistent throughout this document. Revise the document for consistency and provide the basis and criteria that will be used for evaluating the use of these structures. The default position for all plans or processes should be what is in the RODA.

Specific Comments

50. Section 1.1 Project Description, page 1-1.
    a. Revise the last sentence of the first paragraph by adding the following at the end, "including protection of groundwater by limiting infiltration and thus leaching of contaminants."

    b. Delete the second paragraph and first 6 bullets on the page and replace it with the following:
    "USEPA and the Respondents have entered into the Third Amendment to the Administrative Settlement Agreement and Order on Consent (USEPA Docket No. VII-93-F-0005) dated May 6, 2018 (ASAOC). The attached Remedial Design Statement of Work, or RD SOW, contains the requirements for developing the Remedial Design to implement the selected Remedy presented in the September 27, 2018 Record of Decision Amendment, or RODA. The scope of the remedy selected in the RODA includes: [*Insert the language from Section 1.3 of the RODA.*]"

    c. In the fourth paragraph, add, "and To Be Considered requirements or TBCs," after (ARARs).

d. In the first sentence of the sixth paragraph (above the second set of bullets), delete "using expedited investigations and design of the critical path components."

e. In the first bullet at the bottom of page 1-1, Remedial Design Report should be changed to Remedial Design Workplan.

51. Section 1.2 ARARs, page 1.2.
    a. See Comment 45 above regarding the ARAR Table. Revise Table 1 in the DCR to accurately reflect the ARARs in Appendix D of the RODA.

    b. See Comment 33 above and revise the second paragraph in this section accordingly.

    c. In the third paragraph of this section there is discussion about the building codes and elements that might be applicable to onsite construction. Evaluate whether the potential health and safety issues and emissions associated with buildings over or enclosing waste containing radiologic material or explosive gasses would be addressed by the county and city codes mentioned, or whether other standards or criteria should be listed and considered in the design.

52. Section 1.4 Report Organization, page 1-2 and 1-3.
    a. Appendix E of the RD/RA Handbook, June 1995 recommends that the DCR be submitted at approximately 10% completion of the design. Delete the first sentence of this paragraph. Delete the word "However" and, "to provide an accelerated understanding of key technical areas that will impact the RD for this project" in the second sentence.

    b. The last sentence of this section states, "The technical evaluations and decisions regarding these requirements will be provided in future RD deliverables." Revise this DCR so that the ARARs, standards, codes, requirements or thresholds mentioned throughout the document, are identified as specifically as possible at this point in the design process. Cite the RD submittal that will include the technical evaluations, or the discussion and conclusions of the evaluations to determine criteria that will be used. This is important for EPA to understand the process and logistics of the work being proposed.

53. Section 2.1 Site Security, page 2-1. Add a description and discussion of video surveillance for OU-1.

54. Section 3.0 Environmental and Community Protection and Monitoring During Remedial Action, page 3-1. This Section title specifically refers to monitoring during RA, yet each of the subsections focuses only on monitoring during RD. This section must discuss the monitoring needed during and after RA and the ARARs, criteria and thresholds that will be the basis for developing the monitoring plans.

55. Section 3.1 Dust Control, page 3-1.
    a. Revise this section in accordance with comments 7 through 7.a. iv. in EPA's August 27, 2019, comment letter on the July 2019 Site Management Plan.

    b. This section discusses potential sources of air impacts from vegetation removal only. The discussion in this section should include all activities during the RD and RA with the potential to generate dust such as truck and equipment movement and excavation. This section must state the ARARs, criteria, standards, or thresholds that will be used to evaluate airborne dust. Add this discussion and criteria to this section or specify where and when it will be provided in detail.

56. Section 3.2 Perimeter Air Monitoring, page 3-1. Delete the word perimeter from the title of the section. Expand the section to discuss any air monitoring anticipated to occur during RD and RA. Describe the purpose and goals of each Air Monitoring Program. Include discussion of any preliminary information needed to develop the RA air monitoring program. This section must state the ARARs, criteria, standards, or thresholds that will be considered as part of the monitoring programs or specify where and when this information will be provided.

    Section 3.3. Stormwater Off-site Discharge, page 3.3. Change the title of this section to "Stormwater Monitoring" Describe the purpose and goals of the stormwater monitoring during both the RD and the RA. Include discussion of any preliminary information needed to develop the RA stormwater monitoring program. This section must state the ARARs, criteria, standards, or thresholds that will be considered as part of the monitoring programs or specify where and when this information will be provided.

57. Section 4.2 Discharge and Detention Requirements, page 4-1. The first paragraph of this section indicates the primary purpose of a sedimentation basin is to reduce particulate solids from leaving the site. During active excavation and waste staging, the goal should be to prevent particulate solids from leaving the site. Therefore, general construction requirements for temporary basins or features for a similar purpose may not be sufficient during the RA, and must be further evaluated. State when and in which documents stormwater calculations for determining the need for detentions basins will be submitted and add these calculations to Table 4 of the RDWP.

58. Section 5.1 Definition of Area 1 and Area 2 Excavation Boundaries, page 5-1.
    a. Add "except as stated in the RODA and approved by EPA." to the end of the first sentence in the first paragraph.

    b. Revise the first paragraph of this section by replacing "5 pCi/g above background" with "7.9 pCi/g" and replacing "50 pCi/g" with "54.5pCi/g".

c. The second paragraph provides a description of the total radioactivity criteria that varies from the RODA. Page 65 of the RODA states, "During RD, the EPA will develop a final estimate of the radioactivity that would have been removed for Proposed Plan Alternative 4 (RIM greater than 52.9 pCi/g to a depth of 16 feet) using the same geostatistical model and formulas that will be used to develop the targeted excavation plan for the Amended Remedy. The resulting estimate of radioactivity removed for Alternative 4 must then be achieved during the implementation of the Amended Remedy..." Revise the second sentence as follows, "The RODA defines a requirement for total radioactivity to be removed to be equivalent to the total radioactivity represented by the combined radium and thorium greater than 52.9 pCi/g down to 16 feet below the 2005 topographic surface."

   This paragraph also states that the total radioactivity will be determined by multiplying the radioactivity by the volume and mass of survey units defined in the RD model. The total radioactivity calculation should result in a value defined in units of curies or becquerels and therefore it is not clear how the calculation as written will result in such a value. Revise the sentence to clarify the approach to calculating total radioactivity.

   The sentence that begins with "The final excavation boundary for the Modified Alternative 4" is misleading as it seems to imply the RODA selected remedy requires a set excavation depth of 12 feet below the 2005 topographic surface. To prevent confusion, revise the last two sentences as follows, "The RODA selected remedy generally requires removal of RIM greater than 52.9 pCi/g to a depth of 12 feet below the 2005 surface but will include removal of some RIM between 12 and 20 feet below the 2005 surface and allow for isolated pockets of RIM greater 52.9 pCi/g between 8 feet and 12 feet below the 2005 surface to remain in place. The approach to selecting the locations that will deviate from the general depth of 12 feet below the 2005 surface are discussed in the next paragraph. The RODA also requires that each total radioactivity calculation be computed using the same RD geostatistical model. This will require developing a common RD geostatistical model with common survey unit geometries for each of these two excavation descriptions using the same data set."

d. Revise the third paragraph of Section 5.1 by revising the first and second sentences to read, "Removal of RIM greater than 52.9 pCi/g to 12-feet below the 2005 topographic surface which is generally required for RODA selected remedy would result in the removal of less radioactivity than a similar excavation to 16-foot below the 2005 topographic surface described in Alternative 4 of the Proposed Plan. Therefore, the RD excavation design must include additional removal below the 12-foot depth in order to achieve a total radioactivity removal equivalent to Alternative 4 in the Proposed Plan."

e. A number of significant comments were provided to the respondents previously for the geostatistical model as it was presented in the December 22, 2017 3D extent of RIM Report. EPA determined the model was sufficient for the evaluation of remedial alternatives presented in the Final Feasibility Study. In general, the accuracy and precision of any modeling developed or used for the Remedial Design must be appropriate to define the excavation required for the selected remedy. Since the model is fundamental to the design moving forward, the details of modeling assumptions and development activities should be provided early and discussed in order to ensure previous concerns are addressed if the same modeling approach is selected. This will also help ensure that model development does not become an impediment to timely development of the remedial design. See RDWP comment 25.c.

f. Include in the last paragraph of this section the general approach to ensuring data quality with respect to field screening or "soft" data. Field screening procedures and the use of any resulting "soft" data during the design investigation for characterization or decision-making must include fully developed Data Quality Objectives or DQOs and Measurement Quality Objectives or MQOs defined in the Design Investigation Workplan, Quality Assurance Project Plan, and/or Field Sampling Plan.

59. Section 5.2. Definition of Buffer Zone/ Lot 2A2 Excavation Boundaries, page 5-1 and 5-2. As discussed in comments 22. d. i. and 25. b. for the RDWP, Additional background characterization must be conducted for each radiological COC listed in the RODA unless a specific justification can be made that another radionuclide can act as a surrogate for one or more radiological COC's. Table 1 from the RODA (pdf page 199) lists the background concentrations for each radionuclide from the previous background investigation. EPA notes that section 2.5 and Table 17 from the January 2018 Updated Baseline Risk Assessment provides justification for selection of surrogate radionuclides for risk assessment purposes and may be useful for determining which radionuclides will require additional background characterization. Revise the discussion in this section on page 5-1 after considering the information above.

The last two sentences of section 5.2 on page 5-2 are not clear. The first of the two sentences seem to imply that individual soil samples from within survey units will be compared to the range of background values. It is not clear how a comparison of a single sample result will be made to a range of background values to determine whether survey unit is distinctly elevated above background. There are a variety of sampling, surveying, and statistical approaches provided in guidance that can be used to evaluate this portion of the Site, e.g. Multi-Agency Radiation Survey and Site Investigation Manual or MARSSIM (https://www.epa.gov/radiation/multi-agency-radiation-survey-and-site-investigation-manual-marssim), NUREG-1505 (https://www.nrc.gov/docs/ML0618/ML061870462.pdf), and Incremental Soil Sampling or ISM (https://www.itrcweb.org/ism-1/). The RODA does not specify a sampling approach for characterizing the Buffer Zone/Lot 2A2 other than to

limit the individual survey units to no larger than 2,000 square meters. Replace the last sentence with the expected statistical test(s) that will be used to compare data sets from samples collected within survey units to the background data set. If this information is still being developed, specify which RD deliverable will present the approach to characterizing the soil on the Buffer Zone/Lot 2A2.

60. Section 5.3 Confirmation Sampling, page 5.2. The last two sentences of the first paragraph state that confirmation sampling will be used to confirm the total radioactivity removal require in the RODA will be achieved at the completion of the RA and that the samples will be input into the model to confirm the model accuracy. Confirmation sampling should be used to confirm the boundaries of the RIM to be removed predicted by the model are accurate. This in general means that samples should be collected within specific survey units from the wastes located just above, besides, and underneath RIM proposed to be removed. An exception would include, for example, areas where RIM greater 52.9 pCi/g is located at 12 feet below the 2005 topographic surface and deeper removal is not proposed. The results of these samples should be used to determine a representative concentration of combined radium and combined thorium for that survey unit which would be compared to the 52.9 pCi/g concentration criteria. The survey unit would confirm the excavation boundary if the representative concentration is less than the concentration criteria. In this way, the confirmation samples indirectly ensure that the total radioactivity removal required in the RODA will be achieved by acting as a check against the model. However, it is not clear how incorporating these samples into the RD geostatistical model will provide an opportunity to confirm the model accuracy. Revise this paragraph by expanding the discussion of the purpose of confirmation sampling and clarify how these samples will be utilized in the updated RD geostatistical model if that is intended.

    The last sentence of the second paragraph states that the respondents anticipate confirmation sampling will be best executed during the RD and additional confirmation sampling would not be required in the RA. This statement varies from the description of the amended remedy on page 66 of the RODA which states, "A combination of radiological field screening and analytical sampling techniques will be used during the RIM excavation process." As stated in comment 16. d., the criteria that would guide this pre-excavation approach to confirmation sampling have not been provided to EPA at this time and additional information is required before EPA can fully consider this method for approval. Specify which RD Deliverable will provide the approach to confirmation sampling.

    The last paragraph states that additional borings will be drilled, logged, and sampled during the RD to define boundary of the engineered cover which is a requirement of the design investigation. However, no criteria or even an approach to selecting boring locations or the number and depth of samples within each boring. Revise this paragraph by including any anticipated criteria for this required portion of the design investigation or state which RD deliverable will present these criteria.

61. Section 5.4 Excavation Safety, page 5-2. State the document that will contain safety information related to excavation. Also state which plan will identify the need for shoring, if necessary. where information re excavation safety will be documented in

62. Section 5.5 Contact Water and Leachate Management, page 5-3. The first sentence in this section states, "Contact water and leachate removed from the excavation will be conveyed to the on-site construction water treatment plant for treatment prior to approved discharge." This statement appears to conflict with a similar statement in Section 2.4 which states that a temporary water treatment plant will be built "if necessary." The need and specifications for on-site pretreatment should be evaluated in the overall design. Replace the statement with one that discusses evaluation of pre-treatment needs and appropriate disposal of contact water and leachate and the specific regulatory standards and requirements for management of contact water and leachate.

63. Section 5.6 Air Quality and Odor, Page 5-3.
    a. Add a reference to Section 5.8, which discusses development of criteria for temporary cover to the last sentence of this section.

    b. Add discussion about the putrescible waste evaluation which is required for the wildlife hazard survey and will help evaluate potential odor concerns and criteria for cover. See comment 15 above in the RDWP.

    c. State the document or plan that will contain the tiered approach for odor control.

64. Section 5.7 Wildlife Management. Page 5-3 and 5-4.
    a. Add a brief discussion of the one-year wildlife hazard survey that will help guide development of the Wildlife Management Plan.

    b. Expand the second paragraph of this section to discuss whether the existing plan is sufficient for use during the Design Investigation work and state the criteria that will be used to make that determination.

65. Section 5.8. Daily and Intermediate Covers, Page 5-4. In addition to the controls mentioned in the first sentence of this section, the daily and intermediate cover should also reduce oxygen infiltration to prevent fires and prevent blowing litter. Add design criteria for these additional purposes for the temporary cover.

66. Section 5.9 Contingency for "Atypical Items" Encountered During Excavation, page 5-4 and 5-5. Add a subsection for potential Hazardous Waste and the ARARs or criteria that will apply to that waste.

67. Section 6.3 Containment Requirements, page 6-2. Revise the second paragraph in accordance with comments 3 and 29 on the RDWP. Add discussion of any evaluation proposed and criteria and where and when such information would be presented.

68. Section 6.4 Contact Water and Leachate Management, page 6-2. See Comment 62.

69. Section 6.8 Structures and Mechanical/Electrical Systems. Page 6-3.
    a. Include design provisions for monitoring landfill gas within any occupied temporary structures or confined areas. See comment 51.c.

    b. Include design considerations for gas monitoring along preferential pathways such as utility lines.

70. Section 8.1 Waste Classification, page 8-1. The first sentence of the second paragraph should also be included in the hazardous waste subsection EPA requested be added to Section 5.9 above.

71. Section 8.2 Disposal Site Requirements and Community Acceptance, page 8-1. Delete the first three sentences of this section as this narrative is not relevant to the RD. Revise the fourth sentence as follows, "An analysis will be required for any non-NRC-licensed facility before it can be selected for RIM disposal. Revise the last sentence as follows, "This analysis, if necessary, will be conducted as part of the RD and provided to the State of Missouri and the receiving state that the non-NRC-licensed disposal facility is located in for comment. Ultimately, only after EPA approval of the analysis can the facility be accepted for disposal of RIM-containing waste from this site.

72. Section 8.3 Waste Acceptance Criteria. Page 8-1 to 8-2. Provide information about where and when the evaluation of waste acceptance criteria, or WAC and the existing site data set will be presented.

73. Section 9.1 Definitions, page 9-1.
    a. Define the difference between "contact water" as used in sections 5 and 6 of this document and "construction water" as defined in Section 9. They both appear to mean water that has come into contact with waste or leachate. If they are the same, use the term contact water consistently.

    b. In theory it is relatively easy to define water that falls on clean soil cover or foams overlying waste as not construction water; however, making that determination in the field due to infiltration or saturation conditions is much less straight forward. Additional discussion and evaluation regarding differentiation of contact (construction) versus non-contact (non-construction) water will be required in the Storm Water Pollution Prevention Plan or elsewhere.

74. Section 9.3. Sludge and Treatment Media Disposal, page 9-1. Include provisions for testing sludge and treatment media prior to disposal.

75. Section 9.4. Pumping, Treatment, Transmission, and Storage, page 9-1. Construction of a pre-treatment facility was not evaluated in the Final Feasibility Study or discussed in the RODA and may have regulatory requirements not cited in the ARARs, such as 40 CFR Part 403. If developing pretreatment options prior to discharge to waters of the state, consider whether additional requirements or regulations may apply.

76. Section 11.1. Final Cover Boundary Definition, page 11-1. In this section, define what is meant by the terms outer and interior boundaries of Areas 1 and 2 and the criteria that will be used to define each boundary. Revise the last sentence as follows, "Additional investigation will be necessary in the DI to provide data to define the interior and exterior boundaries of the final cover.

77. Section 11.2 Regrading and Finished Grade, page 11-1. Refer to comments 35.c and 35.d on the RDWP. State how optimal slopes will be evaluated and what criteria will be used for the evaluation in this DCR.

78. Section 11.3.1 USEPA and MDNR, page 11-1 and 11-2. Revise the first sentence of the first paragraph of this section to say, "The final cover will consist of a least two feet of compacted low-permeability clay with a permeability coefficient of 1×10^{-7} for minimizing precipitation infiltration and overlaid by at least...", and delete the second sentence of the first paragraph.

79. Section 11.3.2. UMTRCA, Page 11-2. Develop this section to include performance evaluation of cover design elements to achieve longevity requirements.

80. Section 11.3.3. North Quarry Overlay, Page 11-2. The term "classical" has no design meaning, and the citation refers to several designs. Expand the section to clearly develop the design of the proposed cover over portions of Area 1 are adjacent to or lie underneath the North Quarry portion of the Bridgeton Landfill including which ARARs or TBCs are relevant to this portion of the cap design. See comment 3

81. Section 11.4 Seismic, page 11-2.
    a. *"Pseudo-static slope stability analyses will be performed for the side slopes and final cover system per the procedures outlined in EPA 600-R-95-051 'RCRA Subtitle D (258) Seismic Guidance for Municipal Solid Waste Landfill Facilities."* Other ARARs may require more stringent slope stability analysis and the guidance does not consider longevity requirements for 200/1000 year cover life. Develop more robust slope stability analyses that meets or exceeds ARARs and considers longevity requirements and guidance identified as TBCs.

b. *"If the pseudo-static slope stability analyses have a factor of safety of 1.0 or greater, no additional analyses will be required per the guidance."* A factor of safety of 1.0 represents stress at the maximum allowable limit and less than 1.0 indicates failure. Additionally, materials used in landfill design tend to have variable engineering properties that rarely allow for design at the threshold of failure. A reasonable factor of safety for slope stability that considers material variability and longevity requirements of the cover must be selected.

82. Section 11.5. Landfill Gas, Page 11-3. This section states, "Landfill gas can also cause vapor pressure gradients that can accelerate radon's migration to the ground surface during the first years after closure until landfill gas production is minimal. It should be noted that radon gas is naturally-occurring and is generally present in landfill gases." EPA notes that the UMTRCA standard in 40 CFR 192.02 (b) (2) has been identified as an ARAR and states that Control of residual radioactive materials and their listed constituents shall be designed to provide reasonable assurance that releases of radon-222 from residual radioactive material to the atmosphere will not increase the annual average concentration of radon-222 in air at or above any location outside the disposal site by more than one-half picocurie per liter. Therefore, the design of any landfill gas management system must demonstrate compliance with this ARAR. In the last sentence of this section, delete the word "passive" and develop the section that includes an evaluation that considers all types of gas management systems to determine the appropriate technology.

83. Section 11.7. Restoration, Page 11-3. Develop design elements for native prairie grassland to account for any special maintenance requirements such as the potential for controlled burns.

84. Section 12.0. Permanent Stormwater and Erosion Control, page 12-1: Section 12.1 of this DCR states, "The stormwater management elements... will be designed for at least a 25-year, 24-hour storm per Missouri solid waste regulations 10 CSR § 80-3.010(8)(B)1F to the extent practicable." However, the TBC *Technical Guidance Document: Final Covers on Hazardous Waste Landfills and Surface Impoundments* states on page 2-14 to 2-16, "For containment applications with a higher level of risk to human health and the environment, such as for low-level radioactive waste disposal at facilities, the design storm may be developed based on human health risk, statistical analysis of precipitation events, the probable maximum precipitation event or other factors. Given the longevity requirements of UMTRCA ARARs, permanent stormwater management elements must be further evaluated and the design criteria based on lower frequency, higher intensity rainfall events or other site-specific factors. Revise the subsections in Section 12 to factor in longevity requirements of UMTRCA and based upon information in the TBC technical guidance documents.

85. Section 12.2. Discharge and Detention Requirements, page 12-1. As stated in a number of documents developed by the responsible parties, including Section 4.12 of the Remedial Investigation Addendum, there are large areas of OU-1 with no-discharge surface water ponding. Additional volume and discharge points should be considered, at minimum. Revise

Section 12.2 to include evaluation for the potential for additional discharge and detention requirements. See comment 84.

86. Section 12.3. Erosion and Sediment Control Best Management Practices, page 12-1. See comment 84. Include information from the TBC technical guidance documents.

87. Section 13.0. Post-Remedial Action Flood Protection, page 13-1. Include substantive discussion for localized flooding and consideration of comment 84 above.

88. Section 14.0. Post-Remedial Action Operation, Monitoring, and Maintenance. Page 14.1. All three of the subsections in Section 14 just state that the activity will be conducted per the requirements of the SMP; however, the SMP does not contain any information yet about the post-RA operation, monitoring and maintenance activities and this DCR should include, at a minimum, the basis for the required monitoring and inspections and the ARARs, TBCs, or other standards that will guide the development of the various plans. Revise accordingly.