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

SEP 1 2 2019

Ms. Victoria Warren
Project Coordinator
Republic Services
6711 West 1000 North
McCordsville, Indiana 46055

Dear Ms. Warren:

The U.S. Environmental Protection Agency has reviewed the June 11, 2019, Draft Remedial Design, or RD, Work Plan, West Lake Landfill, Operable Unit 2. This document was developed on behalf of the West Lake Landfill Operable Unit 2 Respondent, Bridgeton Landfill, LLC to support the remedial design of the Inactive Sanitary Landfill portion of Operable Unit, or OU, 2 for the West Lake Landfill Site, in Bridgeton, Missouri. The EPA is disapproving the document as submitted. Please revise the document in accordance with the enclosed technical comments.

The EPA has coordinated its review of this document with the Missouri Department of Natural Resources and the Kansas City District of the U.S. Army Corps of Engineers. In accordance with the Third Amendment to the Settlement Agreement and Order on Consent, VII 94-F-0025, the Respondent shall prepare a revised RD Work Plan for OU-2 that incorporates the EPA's comments and requested changes within 30 days of receipt of this letter. Contact me with questions at (913) 551-7789 or by e-mail at barker.justin@epa.gov.

Sincerely,

Justin Barker
Remedial Project Manager
Site Remediation Branch
Superfund and Emergency Management Division

Enclosure

cc: Mr. Ryan Seabaugh, MDNR

COMMENTS ON THE REMEDIAL DESIGN WORK PLAN
WEST LAKE LANDFILL SITE OPERABLE UNIT 2 (OU-2),
Bridgeton Missouri, Dated June 11, 2019

GENERAL COMMENTS ON THE OU-2 REMEDIAL DESIGN WORK PLAN

1. General: In general, the remedial design, or RD, work plan for the Inactive Sanitary Landfill portion of Operable Unit, or OU, -2 fails to take into consideration the on-going RD and pending remedial action, or RA, work associated with OU-1. Revise the RD work plan by including discussion on the Inactive Sanitary Landfill work elements that require coordination with the ongoing or pending work for the other OUs. The discussion shall generally include items that will or can be reasonably anticipated to affect the RD and associated RA at the Inactive Sanitary Landfill portion of OU-2.

2. General: The OU-2 Record of Decision, or ROD, contains requirements for groundwater performance monitoring, thus a groundwater monitoring plan must be developed for the OU-2 remedy and included within the OU-2 workplan. Any specific coordination needs, and relative timing based on anticipated milestones for the OU-3 should be assessed and included in the OU-2 Work Plan. Revise the OU-2 Work Plan to include a discussion of how the OU-2 groundwater monitoring program will meet the requirements of the OU-2 ROD.

3. General: If there is no intent in the Work Plan to provide specific RD information on the Demolition and Former Active Landfill (Bridgeton Landfill) portions of OU-2, then the titles of these documents are misleading as presented. Revise submittal to globally add "Inactive Sanitary Landfill" in title pages of document submittals to make them less misleading.

4. General: Updated Missouri Department of Natural Resources, or MDNR, Solid Waste Management regulations have recently been promulgated. Globally revise citations to provide the effective date in order to ensure the regulatory requirements that were in effect at the time of the ROD is correctly referenced.

5. General: Regulatory terminology has changed. Globally replace the term "*active or passive landfill gas control system*" with "*landfill gas collection and control system*" to be consistent with current regulatory terminology.

6. General: In response to prior comments, it was stated that references to the term "*probes*" will be replaced with references to "*wells*." The RD planning submittals do not reflect that statement. Globally revise the document to refer to gas monitoring wells as "*wells*" instead of "*probes*."

7. General: The drawings provided with the OU-2 RD Work Plan show a general outline of the Inactive Sanitary Landfill, but no citation or other detail is provided regarding what source(s) of information were used that verify that the limits as shown are accurate and representative. Revise the document to include what information was used to define the extent of the Inactive Sanitary Landfill and provide a description of any limitations associated with this information,

including consideration of anticipated/pending OU-1 RD/RA activities that may refine or modify current understanding.

8. General: The analysis method(s) and/or procedure(s) for calculating storm water run-on/run-off from the proposed cover as well as the drainage layer for design purposes was not provided in the OU-2 RD Work Plan submittal. Revise the submittal to include this information with appropriate references and supporting calculations.

FEEDBACK ON RESPONSIBLE PARTY RESPONSES TO EPA COMMENTS

9. Response to EPA Comment 1: The response to EPA Comment 1 fails to fully address the EPA's concerns regarding a subsurface heating event (SSHE as used in this document). Even if the possibility that a SSHE could occur appears remote, given the general unpredictability of SSHEs, the possibility must be considered and adequately addressed within the OU-2 RD Work Plan. Revise the OU-2 RD Work Plan to include input generally summarizing the following items: (1) the separation distance and nature of the materials described to be between the two landfill cells; (2) site-specific features of the Inactive Sanitary Landfill such as the geo-physical setting, age of waste, thickness of waste, and other relevant items; and (3) and a determination whether any of the design elements for the Inactive Sanitary Landfill need to be modified to address a SSHE.

10. Response to EPA Comment 1: Provide a reference or citation regarding specific information available that demonstrate there is native rock/soil/materials, including information regarding the approximate thickness of these materials that are presumed to be located between the South Quarry portion of Bridgeton Landfill and the Inactive Sanitary Landfill. This information must be included in the submittal. If not, the EPA requires that soil borings be planned and advanced between the landfill waste cells to verify there is no continuity of the waste between these waste cells.

FEEDBACK ON RESPONSIBLE PARTY RESPONSES TO MDNR COMMENTS

11. Response to MDNR Comment 1: Responsible Party response to General MDNR Comment 1, Groundwater monitoring. *"Consistent with the discussion earlier in this letter, groundwater issues and monitoring for OU-2 will be deferred to the OU-3 RI/FS Process and will not be addressed as part of this Work Plan."*

    The OU-2 ROD contains requirements for groundwater performance monitoring, thus a groundwater monitoring plan must be developed for the OU-2 remedy. Any specific coordination needs, and relative timing based on anticipated milestones for the other operable units at the Site (OU-1 or OU-3) should be generally included in the OU-2 Work Plan. Revise the OU-2 Work Plan to include a discussion of how the OU-2 groundwater monitoring program will meet the requirements of the OU-2 ROD.

12. Response to DNR Comment 3: Revise the OU-2 RD Work Plan submittal to provide a figure with supporting narrative in the OU-2 Work Plan of the proposed containment/cover system for the Inactive Sanitary Landfill, including general summary information regarding the anticipated interface between the OU-1 and OU-2 areas at the site and the proposed storm water conveyance and control system. This revision to the OU-2 RD work plan must also include a

narrative identifying what specific coordination steps and information exchange needs to occur associated with OU-1 RD activities, and at which stage/milestone in the process it is anticipated that sufficient information will be available to move forward with specified aspects of the OU-2 design.

SPECIFIC COMMENTS ON THE OU-2 REMEDIAL DESIGN WORK PLAN

1. Section 1.0 Introduction, page 1, bullet 1: The narrative in this bullet fails to fully address the EPA's concerns regarding a subsurface heating event (SSHE as used in this document). Even if the possibility that a SSHE could occur appears remote, given the general unpredictability of SSHEs, the possibility should be further considered and adequately addressed within the OU-2 RD Work Plan. Revise OU-2 RD Work Plan to include narrative that provides input as described in Comment 9 (see above) *"Feedback on Responsible Parties Response to EPA Comment 1"*.

2. Section 1.0 Introduction, page 1 & 2, bullets 3 & 4: The EPA agrees that the OU-1 RD/RA and the OU-3 Remedial Investigation/Feasibility Study, or RI/FS, are not completed actions at this time, however, work elements related to the OU-1 RD/RA and OU-3 RI/FS are known and have the potential to impact the approach and sequencing of the OU-2 RD For example, the OU-1 RD Statement of Work, or SOW, requires design related investigation(s) to occur along the southern border of OU-1 Area 2, which is adjacent to the Inactive Sanitary Landfill, which may impact the approach and/or sequencing of OU-2 RD field work and design elements. Additionally, in consideration of the planned OU-3 RI/FS work, if certain specific information is to be obtained from the OU-3 RI/FS process that may impact the approach or sequencing of groundwater monitoring planning for OU-2, these items must be presented in the OU-2 RD Work Plan. Revise these bullets and include discussions of anticipated impacts to the approach and sequencing of OU-2 RD specific items or add a reference to where these discussions will be presented in the OU-2 RD Work Plan.

3. Section 1.0 Introduction, page 2, bullet 5: Revise this bullet to clearly explain what specific MDNR comments are being "deferred" to the OU-3 RI/FS or remove this portion of the bullet. The groundwater performance monitoring required in the OU-2 ROD cannot be deferred pending RI/FS work. See related general comment and specific comments to Sections 2.1, and 2.2.2.

4. Section 1.0 Introduction, page 2, bullet 6: This bullet states that the OU-2 SOW schedule is dependent upon the OU-1 RD/RA and OU-3 RD/RA. Revise to add text that explains specifically how the OU-2 SOW schedule is dependent upon the OU-1 and OU-3 schedules and how this dependence will be addressed in the planning process for the OU-2 remedial design.

5. Section 2.1 Description of the Selected Remedy, page 4: Revise to delete *"However, groundwater issues and monitoring for OU-2 will be deferred to the OU-3 RI/FS Process and will not be addressed as part of this Work Plan."* Groundwater performance monitoring is part of the OU-2 ROD and must be addressed by the OU-2 Work Plan and RD.

6. Section 2.2.2 Groundwater Monitoring, page 5: Delete *"Groundwater issues and monitoring for OU-2 are being handled pursuant to OU-3 and will not be addressed as part of this Work Plan."* and revise to address design and implementation of groundwater performance monitoring program.

7. Section 2.2.4 Landfill Gas Monitoring and Control, page 6: Since a landfill gas control system could be deemed necessary, provide a general overview of the landfill gas control system design in the OU-2 RD Work Plan in this section. Please reference in this section that a preliminary assessment of landfill gas occurrence and concentrations will be conducted as described in Appendix C, Section 5.3, since this will aid in the assessment for the need to design and install a gas control system. Additionally, in this section explain if the gas control system could be applied to the proposed cap design without (1) major modifications to the cap design or (2) unwanted impacts to the underlying waste materials.

8. Section 3.0 Design Team, page 8: This section states: *"Installation and testing of landfill gas wells to assess the presence and extent of occurrences of landfill gases along the outer (property) boundaries of Inactive Sanitary Landfill;"* Revise to insert "monitoring" prior to "wells."

9. Section 3.0 Design Team, page 8: Revise section to include narrative that generally describes when, how, and why the OU-2 RD team (CEC) as discussed in this section plans to coordinate with the OU-1 RD team and the OU-3 RI/FS team to support the overall OU-2 RD.

10. Section 4.0 Design Investigations, item 2, page 10: This general statement does not appear to be in compliance with regulatory requirements for landfill gas monitoring. For example, regulatory requirements for maximum spacing between landfill gas compliance monitoring wells is 500 feet. Revise design investigation item number 2 and related portions of the work plan documents to be consistent with regulatory requirements and include the citation in this section for potential corrective measures.

11. Section 4.0 Design Investigations, item 4, pages 10 & 11: Neither the May 14, 2019 walkover observations made by the Landfill Design Team, nor the proposed placement and monitoring of 13 survey pins over a period of 12 to 18 months (RD phase) is sufficient to verify the stability of the steep slope as discussed in this section. State regulations specify a geotechnical analysis for any slopes exceeding 25% (4H:1V). Revise this section to specify that geotechnical samples will be collected and analyzed as necessary to perform a slope stability analysis, as required by regulation.

12. Section 4.0 Design Investigations, item 4, pages 10 & 11: Revise this section to state that a thorough slope stability analysis will be conducted in general accordance with 10 CSR 80-3 (17) E and F) to better understand current site conditions and to plan for and prevent future issues related to the final cover and slope stability, including the potential for catastrophic instability.

13. Section 4.0 Design Investigations, item 6, page 11: Revise this section to acknowledge that the drains and vertical concrete standpipes currently visible from the surface of the Inactive Sanitary Landfill may have additional buried infrastructure within the subsurface. Further revise the section to explain whether this infrastructure could affect the slope and/or cover stability. Also

describe how the presence of this infrastructure will be accounted for in the RD.

14. Section 4.0 Design Investigations, item 6, page 11, bullets 1 through 4: Item 6 in the list of bullets identifies four items that require additional investigation but there is no description of what the investigations will entail or how/when they will be initiated. Revise this section to generally describe how, when and why the additional investigations discussed in this section are planned to occur.

15. Section 4.0 Design Investigations, item 6, pages 10 & 11: This section describes potential stormwater drains and conveyance structures in the Inactive Sanitary landfill that require further investigation during RD. Revise this section to state the RD stormwater investigation will determine if point source discharges are occuring and will provide plans to address them if identified, so the final design can incorporate any conveyance and treatment requirements of the stormwater management system in accordance with the ROD.

16. Section 4.0 Design Investigations, pages 10-11: This section states: *"Several issues were noted during the site walkover performed on November 11, 2008, and more recently on May 14, 2019, and will also need to be investigated as part of the RD."* Revise the section by listing the RD deliverable(s) that will be developed to present the plans for the investigations needed to address the items and issues discussed in this section, as well as, the RD deliverable(s) such as reports where the results and conclusions from these investigations will be presented.

17. Section 4.0 Design Investigations, page 10-11: Revise section to include an item for establishing baseline groundwater conditions prior to performance groundwater monitoring.

18. Section 5.1 Missouri Solid Waste Rules for Sanitary Landfills, page 13: Delete *"While the requirements for a groundwater monitoring program in 10 CSR 80-3.010(11) are considered relevant and appropriate, and monitoring of groundwater for the landfill is ongoing, all groundwater monitoring has been placed into OU-3."* Groundwater performance monitoring is part of the OU-2 ROD and must be addressed by the OU-2 Work Plan and RD. Revise section to address development of groundwater performance monitoring.

19. Section 5.1 Missouri Solid Waste Rules for Sanitary Landfills, Item 4, page 12-13: This text is generally inconsistent with the narrative found in Section 2.2.1, Figure A-8b, and with portions of Table 6-1. The maximum slope is noted as nominally 4H:1V and at most 3H:1V. However, Figure A-8b indicates existing slopes as steep as 1.5H:1V in the western section of the Inactive Sanitary Landfill. The MDNR regulation associated with this item states that a geotechnical slope stability analysis is required to demonstrate that long-term stability of any slope exceeding 25% and that no slope shall exceed 33 1/3%. However, the OU-2 RD Work Plan suggests that no slope stability analysis will be performed and proposes to keep slopes in-place that are at or above 50%. This appears to be a direct contradiction to the MDNR regulations. The last sentence of this paragraph (on page 13) indicates removing the steep slope of the west side would cause more harm that leaving the slope in place, however, no citation or explanation is provided to support this statement. This statement must be supported or removed. Revise all sections and appendices of the RD Work Plan to include the necessary geotechnical evaluation, potential

regrading and "flattening" of the western slope and any other "steep" slope surrounding the Inactive Sanitary Landfill to achieve a maximum slope of no greater than 33 1/3%.

20. Section 5.2 National Ambient Air Quality Standards, page 13: This section discusses the applicability of the National Ambient Air Quality Standards, or NAAQS, to the OU-2 RD activities. This section currently does not provide a rationale for why air monitoring and air sampling will not be needed during RD. Potential air constituents for the Site include but are not limited to; PM_{10}, $PM_{2.5}$, volatile organic constituents, or VOCs, and radionuclides. Air monitoring for radionuclides is required for intrusive work conducted in or near known or suspected areas containing radiologically impacted materials, or RIM. Revise the work plan (and SAP) to include for air monitoring in the event that potentially intrusive work is necessary to implement the remedy.

21. Section 6.0 Conceptual Design and Design Criteria, page 15: This paragraph states that the cover material will be compacted to a density that "should" result in a permeability for this layer of $10^{-5}cm/s^2$. Since this is a regulatory requirement, "should" is not the appropriate term to use here. Also, since the sampling for the thickness of materials that may meet the permeability requirements is taking place prior to regrading of the landfill, revise this section to explain how the remaining materials thickness will be verified following the regrading work and replace the word "should" with "must" in the 2nd sentence of this paragraph.

22. Section 6.1 Conceptual Design, page 15: The following statement is made in this section: *"It is anticipated that regrading of the waste surface will be minimal"*, which appears to be potentially inconsistent with MDNR's Waste Management Program slope requirements for landfills and the identified current site conditions as shown in Figure A-8b. If significant reworking of the steep slope(s) is required, planning for various additional work elements will be needed such as: excavation/grading plans, waste relocation plans, odor control considerations, wildlife mitigation plans, planning for additional stormwater controls, and other potential work elements. Additionally, if re-grading is required, the Work Plan must state how such work would, or would not, be affected by the negative easement agreement with the Saint Louis Airport. Additionally, these work items should be accounted for in the schedule. Revise this section and the schedule to account for and generally discuss the approach and sequencing of the other potential work elements should significant reworking of the steep slopes be required.

23. Section 6.1 Conceptual Design 1st para, page 15: This paragraph indicates that excess fill from areas of the landfill that have more material than necessary for the selected remedy may be relocated to other areas. Also, the landfill cap thickness sampling discussed here does not indicate the depth(s) of the samples (Shelby Tubes) to be collected or provide specific criteria as to when to terminate these borings. Revise this section to provide more detail on the waste relocation activities; minimum and maximum anticipated boring depth(s); and the criteria for using the minimum and maximum depths, such as when waste materials are potentially encountered in these proposed boring locations.

24. Section 7.0 Progress Reports, item 2, page 16: Revise the 2nd bullet to state *"Copies of analytical and geotechnical data received by the..."*

25. Section 8.0 Project Schedule, page 17: The OU-2 RD schedule could be impacted by the extent of the remedial design investigations for slope stability and potentially due to the

relocation/regrading of materials. The draft schedule does not include time for conducting slope stability analysis or related evaluations. Revise the schedule to include provisions for the required slope stability evaluations and for the potential re-grading/flatting of slopes, should they be required. Further, this section states "the actual schedule will be affected by the OU-1 RD/RA process, ..." If the OU-2 RD schedule is currently anticipated to be impacted by the OU-1 RD/RA (or the OU-3 RI/FS, or the OU-3 RD/RA as stated in Section 1.0 of the work plan) the narrative of this section needs to provide a general summary of these anticipated impacts and how these impacts are addressed and accounted for in the overall OU-2 RD planning process. Revise the narrative of this section and the associated schedule (Figure 8-1) to address these items.

26. Table 6-1 Design Basis and Design Criteria: The design criteria column should be more specific to requirements based within the citations in order to identify whether the proposed work complies with the requirements. Revise Table 6-1 to identify specific design criteria requirements in each citation, and reference appropriate locations in the work plan documents where they are being addressed.

27. Table 6-1 Design Basis and Design Criteria: The Design Criteria column in the 1st row of Table 6-1 indicates a Minimum slope of 2% which is inconsistent with the Missouri requirement of 5%. Since the OU-2 ROD allowed for the 2% minimum, revise to add a footnote to the table to explain this item more clearly.

28. Table 6-1 Design Basis and Design Criteria: This indicates one of the components of the cover will be a 2-foot layer of 8" minus quarry rock (limestone) and cites the OU-2 ROD as the basis for this item. If this rock layer is required, it appears it would not be possible to use existing in-place material as the low permeability layer unless it were stripped, replaced and compacted after placement of the rock layer. Revise to explain the purpose and requirement for this rock layer for the Inactive Sanitary Landfill RD. Per Figure 9-1 of the 2008 OU-2 ROD, this item is not a requirement or a component of the OU-2 ROD.

29. Figure 8-1 Remedial Design Schedule: Revise this figure in accordance with the comments provided to Section 8.0 Schedule.

30. Appendix A: Solid Waste Management Program Methane Gas Policy: The procedures outlined in this policy are valid, and the MDNR regulations referenced in this document are based on regulations promulgated on July 31, 1998 and are applicable to the OU-2 ROD selected remedy. To avoid confusion when utilizing the policy, reference to more recent/current regulations in the Work Plan should be avoided.

COMMENTS ON THE REMEDIAL DESIGN
ENVIRONMENTAL QUALITY ASSURANCE PROJECT PLAN (QAPP) Appendix C
WEST LAKE LANDFILL OU-2, JUNE 11, 2019

31. General: The Quality Assurance Project Plan, or QAPP, lacks the full development of project-specific DQOs by application of the DQO Planning Process (EOA QA/G-4). The EPA requires the development of project-specific DQOs by application of the DQO Planning Process, and documentation of the DQO planning process in the QAPP, that the other planning submittals will reference. Revise Section 2.0 of the QAPP to more clearly state data objectives and how the RD will meet the data objectives and revise other planning submittals to reference the QAPP.

32. General: Groundwater performance monitoring is part of the OU-2 ROD and must be addressed by the OU-2 Work Plan and RD. Develop and submit a suitable QAPP that includes objectives and procedures for groundwater performance monitoring.

33. General: Project Task Organization: Within this document, there is inconsistent use of terms for Lead Landfill Designer (see Section 5.2). Revise the document to identify which one of the two licensed engineers identified will stamp the design plans. Additionally, revise the text to include or cite any credentials identified or specified for the Health and Safety Office in the Work Plan (e.g. CIH).

34. Section 1.0 Project/task description and schedule, page 4: This section states: *"Work to be performed in accordance with this RD QAPP consists of:"* The OU-2 ROD includes groundwater performance monitoring as an element of the selected remedy and therefore it must be addressed by the OU-2 Work Plan and RD. Revise to add a bullet for groundwater performance monitoring.

35. Section 1.0 Project/Task Description and Schedule, page 4: Groundwater performance monitoring is an element of the remedy selected in the OU-2 ROD and must be addressed by the OU-2 Work Plan and remedial design. Delete *"Groundwater investigation and monitoring for OU-2 will be deferred to the OU-3 RI/FS process and will not be addressed as part of the RD Work Plan."*

36. Section 1.2 Testing of Potential Borrow Areas, page 5: This section states: *"The frequency and intervals at which these parameters are obtained and measured will be determined by the Laboratory Quality Assurance Officer in consultation with USEPA and MDNR."* Revise to replace "the Laboratory Quality Assurance Officer in consultation with USEPA and MDNR" with "decision criteria included as part of the RD QAPP." Further, revise the RD QAPP to include the decision criteria for this item.

37. Section 1.2 Testing of Potential Borrow Areas, page 5: This section states: *"The resultant data are critical for construction and will be identified in the Remedial Action (RA) construction specifications to be developed after completion of the RD phase of the project."* Revise to replace "and will be identified in the Remedial Action (RA) construction specifications to be developed after completion of the RD phase of the project" with "so decision criteria will be developed as part of the RD QAPP."

38. Section 1.2 Testing of Potential Borrow Areas, page 5: This section states: *"The potential borrow areas that are displayed in Figure A-5, are no longer available and new sources will need to be identified."* Since the information and figure are no longer relevant, they should be removed in order to avoid confusion. Delete references to non-available potential borrow areas and remove the accompanying Figure A-5.

39. Section 1.2 Testing of Potential Borrow Areas, page 5: Per this section, the specifications for acceptable soil properties for the final cover materials and for the compacted clay liner are to be established by the design engineer. Properties such as particle size distribution, saturated hydraulic conductivity, Atterberg limits, and % soil organic material should be established prior to sampling and analyzing any materials from the (local) borrow source. Revise the Work Plan to specifically include this information. The laboratory methods indicated here should be linked with the ASTM methods listed in Section 8.0. Revise this section to specify method correspondence to the list in Section 8.0.

40. Section 1.3 Installation and Monitoring of Temporary Landfill Gas Perimeter Monitoring Probes, page 6: This section states: *"To the extent that temporary landfill gas perimeter monitoring probes remain viable after construction, it is proposed that they remain available for use as long-term monitoring locations, if determined to be necessary after the landfill gas investigation of the Inactive Sanitary Landfill."* This statement appears to conflict with the Responsible Party's response to DNR comments, stating *"The Respondent prefers to properly decommission the wells and then replace them upon completion of cap construction activities."* Clarify or delete the statement.

41. Section 1.3, Installation and Monitoring of Temporary Landfill Gas Perimeter Monitoring Probes, page 5: Figure A-4 as discussed in the Section is missing from the Figures section. It appears there was possibly a duplication of Figure A-3. Check and resolve this issue with Figures A-3 and A-4.

42. Section 1.3 Installation and Monitoring of Temporary Landfill Gas Perimeter Monitoring Probes, 1st para, page 5: This paragraph indicates that the screens for gas monitoring will be at two screened intervals, 5 to 20 feet and 25 to 35 feet. Revise the text to explain the rationale for the proposed screened intervals/depths. Further, the EPA could not identify information in the OU-2 RD Work Plan regarding the bottom elevation of the waste in the Inactive Sanitary Landfill, which would be a factor in selecting where to monitor for potential landfill gas migration. Revise this discussion to provide measured elevation(s) of the base/bottom of waste for the Inactive Sanitary Landfill or provide other supporting information to support the depths of the proposed screened intervals.

43. Section 1.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill Cover, page 6:
    - Revise this section to generally explain the rationale for selecting the grid pattern spacing of 150 feet on center. Both locations CS-32 and CS-71 should have another sampling location added to the east for completeness. Add these additional sampling points or provide an explanation as to why the additional sampling points are not needed.

- Both locations CS-79 and CS-85 should have another sampling location added to the west for completeness. Add these additional sampling points or provide an explanation as to why the additional sampling points are not needed.
- Permeability (should be stated as hydraulic conductivity) testing method should be identified in this section and a reference provided to Section 8.0. Revise this section to include the testing method(s) and add the reference to Section 8.0.

44. Section 1.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill Cover, page 6, paragraph 4: The text states that *"each sampling will be brought to the surface and visually examined to distinguish materials and measure corresponding material thicknesses."* Revise the QAPP to indicate how the materials will be distinguished, including anticipated categorizations of materials (e.g., topsoil, clay, waste material), criteria to be applied to classify the materials, and types of descriptions to be recorded. Furthermore, revise the text to indicate how measurements will be evaluated (e.g., comparisons of measurements to various performance standards).

45. Section 1.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill, page 6, paragraph 3: The text states that each cover thickness sampling point will be surveyed for northing, easting, and surface elevation. Acquisition and management of geospatial data should be defined in the QAPP, consistent with the EPA's "Guidance for Geospatial Data Quality Assurance Project Plans" (EPA QA/G-5G, March 2003).

46. Section 1.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill, page 6, paragraph 5: The text states that Shelby Tube samples will be collected adjacent to selected sampling locations; however, the text does not specify sampling depth interval(s). Revise the text to specify sampling depth intervals or a protocol for determining sampling depth intervals.

47. Section 1.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill, page 6, paragraph 5: The text states that the Shelby tube samples will *"help indicate and confirm whether excess cover materials are available within portions of OU-2."* Revise the text to indicate how Shelby tube data will be evaluated to determine if excess cover materials are available (e.g., comparisons of Shelby tube data to various performance standards).

48. Section 1.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill, page 6, paragraph 5: The text in Section 1.4 states that the Shelby tube samples will be subjected to *"permeability testing at an off-site laboratory."* However, Section 6.4 states that the Shelby tube samples will be tested for *"Atterberg Limits, grain size distribution, and permeability."* And then in Section 8.4 the text states that the Shelby tube samples will be tested for *"moisture content and unit weight."* Revise the text throughout the document for consistency and to clarify and clearly state the specific analyses to be performed on the Shelby tube samples and why it is to be performed. The text of Section 1.4 can reference a subsequent section that specifies those laboratory analyses.

49. Section 1.5 Evaluation of Stormwater Conveyance and Leachate Pumping Well Structures, page 7: A leachate pumping well area was identified on Figure A-7 as being typical ("typ.") but actual details of the well are not presented for better understanding of the issue. A lack of understanding of the fate of leachate generated in or beneath the Inactive Sanitary Landfill is a potentially significant issue as it could undermine the stability of areas located at and beneath the Inactive Sanitary Landfill. Revise section to include any known details of the leachate

pumping well, or state limitations related to information regarding this item.

50. Section 1.7 Slope Stability Verification Along Western Portion of the Inactive Sanitary Landfill, page 8: The statement "*The alignment of fencing and the vegetation indicate that the current slope is stable*" appears anecdotal and unsupported with field measurements or other evidence. The need for sampling, analysis, and engineering evaluations is consistent with text elsewhere on this page but contrary to the statement found on page 18 in Section 6.6 of the QAPP. Further, revise Section 1.7 as follows:
    - The reference to Figure A-8 did not have the identifying sub-letter (a or b). Revise reference to include this missing sub-letter information.
    - The statement that no evidence of fence movement is unclear, and this statement should use other defining descriptors such as "visual" or "locational measurements". Revise text to clarify how no evidence of fence movement was determined. Include more detail and specify if this metric will be monitored and reported on as a part of the RD.
    - Revise this Section to include more details regarding how the decision will be made to determine whether further slope stability evaluation is "warranted". The statement that a further geotechnical sampling investigation may be necessary if slope movement is observed appears open ended, as no technical description of how slope movement will be detected or determined is provided in this section. For example, no description is provided on interpretation of additional soil borings to assess engineering characteristics such as load bearing capacity and translational/rotational failure potential.
    - Revise document to clearly state the determining factors for performing further geotechnical investigations and evaluations and provide a general summary of the steps needed to perform the investigations and evaluations.

51. Section 1.8 Confirmation of Property Ownership Along Old St. Charles Rock Road, page 9: Sensitive electronic measuring devices are to be used during RD work. It is noted that utilities including fiber optic lines are buried near the base slope on some parts of the landfill. Revise this section to state that no measurement interference or other disruption of RD field activities is expected due to the presence of buried utilities or explain how potential measurement interference or other disruptions to RD field activities will be addressed during RD. Revise this section to state that the location of all buried utilities and fiber optic junction boxes will be identified and noted on design documents. Further, revise this section to generally explain how the property ownership item as discussed, this section will be determined and resolved, and how this information will be used to inform the RD, such as supporting the proposed location of landfill gas wells.

52. Section 2.0 Data Quality Objectives and Criteria, page 10: As stated in comment 31, the EPA requires the development of project-specific DQOs. Revise Section 2.0 of the QAPP to clearly state data objectives and how the RD will meet the data objectives. For example, in regard to stormwater data, this section simply states: *"The results of the evaluation are expected to yield data that can be incorporated into an overall stormwater management plan for the Inactive Sanitary Landfill during and after the RA."* There is no description of what this data actually is or how the data is intended to meet the specific data objectives. Revise this section to include

specifically what types of analytical and geotechnical data will be produced during the RD and how this specific data will be used in the design to help make or support decisions.

53. Section 4.0 Documents and Records, page 13: This section briefly describes the records and reports associated with the RD investigation. Revise the text to address the following items:

    - In addition to preparation of records and reports described in this section, the EPA requires storage of spatial data, laboratory analytical data, and field-acquired data in an electronic database (or databases). The EPA requests that the QAPP incorporate active data management approaches, as described in the EPA's *Best Practices for Data Management Technical Guide* (EPA ID # 542-F-18-003). Revise the text to specify/describe implementation, maintenance, and delivery to the EPA of the electronic database(s).

    - The text describes preparation of a "final report" and a "Data Evaluation Report." Include in this section an anticipated table of contents for these reports.

    - The text indicates that the Data Evaluation Report is to include "sampling sheets, chain of custody, analytical data, and a summary" to be submitted to the EPA Project Manager and the MDNR Project Manager. the EPA requires preparation and submittal of individual Data Evaluation Reports following completion of the tasks identified in Sections 1.1, 1.2, 1.3, 1.4, 1.5, and 1.7. Revise to acknowledge the submittal of individual Data Evaluation Reports for each of these items.

54. Section 5.2 Testing of Potential Borrow Areas, page 14: This section states: *"The Landfill Design Manager will have final authority for determining the appropriate number of samples, type of sampling, and testing to be conducted" Revise to* add the following: "based on the approved remedial design decision criteria" to the end of the sentence or delete the sentence.

55. Section 5.2 Testing of Potential Borrow Areas, page 14: The terminology for the engineering team is not consistent with the Project Task Organization Section, as in this section the lead decision person is designated as *"The Landfill Design Manager"* (previously referred to as the *"Landfill Design Engineer"*). Revise this section to clarify the lead decision person designation and to use consistent terminology with other sections of the OU-2 RD Work Plan.

56. Section 5.3 Installation and Monitoring of Temporary Landfill Gas Perimeter Monitoring Probes, page 15: This section states: *"Quarterly methane monitoring will be performed at the installed temporary landfill gas perimeter monitoring probes, as required by 10 CSR 80-3.010(14)(C)(4). Quarterly monitoring of these probes will continue until immediately prior to the commencement of RA construction activities."* Also add a reference to Section 3.0 of the SAP, which discusses this item. Further, it appears this narrative has not been updated to reflect the revised monitoring frequency as presented on Figure 8-1. Globally update language to reflect revised methane monitoring (probes versus wells) as stated in the response to the MDNR comments and to update the frequency as presented on Figure 8-1.

57. Section 5.3 Installation and Monitoring of Temporary Landfill Gas Perimeter Monitoring Probes, page 15:

    - There is no Figure A-4 presented in the QAPP for Appendix C. Rather, the location where

Figure A-4 would exist is occupied by a duplication of Figure A-3 ("Existing Facility Features Map"). Revise Appendix C, Figure A-4 by providing a copy of the aerial map shown in Figure 3-1 of Appendix D. The description should specify if these monitoring locations are intended for monitoring methane gas only unless other gas constituents will be monitored.

- In the last line on this page (pg. 14), there is an incomplete reference to the well driller having asbestos certification(s). Please remove this item or provide explanation as to why it is needed.
- Due to the uncertainties related to the types of waste historically disposed of in the Inactive Sanitary Landfill, revise to include narrative generally describing the procedures and actions that could potentially occur should the RD investigation work encounter hazardous substances or other materials that could result in impacts to the schedule and/or approach of the RD.

58. Section 5.6 Slope Stabilty Verification along Western Portion of the Inactive Sanitary Landfill, page 16: Thirteen survey pins do not constitute a sufficient slope stability evaluation as required by MDNR regulations. Revise section to include for this evaluation.

59. Section 6.2 Testing of Potential Borrow Areas, page 17: Quality control measures must be established when evaluating the pre-selected borrow soil for cover materials. Items such as gravel, plant debris, organic material, clodding soil, and over-sized particles are not desirable material for a landfill cover. These technical considerations are addressed in greater detail in *EPA/600/R-93/182, Quality Assurance and Quality Control for Waste Containment Facilities*. Revise submittal to include a quality control program for evaluating the source of soil cover material. Further, revise section to include the EPA's and the MDNR's approval in the process of selecting suitable cover materials.

60. Section 6.3 Installation and Monitoring of Temporary Landfill Gas Perimeter Monitoring Probes, page 17: It is not apparent what gas analysis method is to be used (ASTM, EPA, or NIOSH). Revise this section to include the testing method(s).

61. Section 6.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill Cover, page 17: Revise this section to include a general description of plans for sealing any sampling points which penetrate the landfill cover with properly hydrated bentonite or other appropriate means.

62. Section 6.6 Slope Stability Verification along Western Portion of the Inactive Sanitary Landfill, page 18: This section states that there are no sample handling activities associated with slope stability analysis, but certain stability analysis methods may require testing data such as compaction, moisture content, drained or un-drained conditions etc. Revise this section to more clearly indicate how the slope stability evaluation process will occur and what specific sample handling, test methods, data reviews, and data quality objectives will be used if the analysis proceeds. Survey pins alone will not sufficiently demonstrate slope stability as required by regulation. Further, revise Section 6.6 to include a topological survey of the final compacted and constructed slopes to ensure required slope geometry has been achieved.

63. Section 7.0 Sample Handling and Custody, pages 19 and 20: Revise the relevant subsections of Section 7.0 (Sample Handling and Custody) to establish unique project numbering systems for sample tracking

64. Section 7.6 Slope Stability along western portion of the Inactive Sanitary Landfill, page 20: The proposed 13 survey pins will be able to document/measure slope movements, but that this item alone does not constitute a sufficient slope stability evaluation as required by MDNR regulations. Revise section to include this evaluation.

65. Section 8.2 Testing of Potential Borrow Areas, and 8.4 Existing Thickness and Material Evaluation of Inactive Sanitary Landfill Cover, page 21: The exact title of each ASTM test method needs to be provided, documented and used correctly in this Section. For example, ASTM uses the term hydraulic conductivity instead of permeability and ASTM D2166 is considered Unconfined Compressive Strength, or UCS, and not Unit Weight (as specified in the document). Revise this section to provide the current, full and correct ASTM titles and year (ex. *ASTM Standard C33, 2003, "Specification for Concrete Aggregates," ASTM International, West Conshohocken, PA, 2003, DOI: 10.1520/C0033-03*). See https://www.astm.org/Msgs/citing.htm for more information.

66. Section 8.6 Slope Stability along western portion of the Inactive Sanitary Landfill, page 22: The proposed 13 survey pins do not constitute a sufficient slope stability evaluation as required by the MDNR's regulations. Revise section to include for this evaluation.

67. Section 9.0 Quality Control, page 23: Revise this section to address the elements described in Section 2.2.5 (Quality Control) of EPA's *Guidance for Quality Assurance Project Plans EPA QA/G-5* (EPA ID $ 240/R-02/009), and establish the following in the revised text:

    - Establish the quality control, or QC, data needed to evaluate reliability and confidence in data generated. Base the requirements for these QC data on the DQOs for the various investigations.

    - Establish QC activities and control limits for field-acquired data, including geospatial data and landfill gas measurements. Base these activities and requirements on the DQOs for the various investigations.

68. Section 10 Instrument / Equipment Testing, Inspection, and Maintenance page 24: The text of this section addresses only field instruments used for landfill gas collection. Revise this section to address all equipment requiring periodic maintenance and/or calibration, including instruments used to acquire geospatial data.

69. Section 12 Non-direct Measurements page 26: This section identifies only one use of previously obtained information: *"...for planning field activities proposed in this RD QAPP."* However, Section 4.0 of the RD Work Plan states that data from previous analyses of 10 Shelby tube samples will be incorporated into the RD effort. Revise this section to identify and discuss all intended uses of previously acquired data, including the previously obtained Shelby tube data

70. Section 14.0 Data Review, Verification, and Validation, page 28: The text states that *"Components of the Level 4 data validation program are provided in Section D.2."* None of the QAPP, SAP, or Work Plan includes a "Section D.2." Revise the text to specify the correct section.

71. Table A-1 Personnel Contact Information: The cited telephone number for the MDNR Project Manager is incorrect. Revise to replace "*3107*" with "*8628*"

COMMENTS ON THE REMEDIAL DESIGN
ENVIRONMENTAL SAMPLING AND ANALYSIS PLAN (RD SAP)
WEST LAKE LANDFILL SITE, OPERABLE UNIT 2 (OU-2),
Bridgeton, Missouri, June 11, 2019

72. General: Groundwater performance monitoring is part of the OU-2 ROD and must be addressed by the OU-2 Work Plan and RD. Revise to add provisions for groundwater performance monitoring into the SAP.

73. General: The level of detail provided in this SAP is insufficient and thus the EPA is unable to fully evaluate the effectiveness of the presented procedures and requirements. Revise the SAP to include identifiable and quantifiable objectives that are developed via the DQO process. See comment #31 for more input on the DQO process.

74. Section 2.0 Sampling Objectives, page 3: Revise this section to include the geotechnical evaluation for slope stability of the western slope of the Inactive Sanitary Landfill and any other steep slopes greater than 25%, per the MDNR's requirements.

75. Section 5.1 Landfill Cover Thickness Evaluation, page 6: Revise this section to include provisions for sealing any sampling points which penetrate the landfill cover with properly hydrated bentonite or other appropriate means.

76. Section 6.0 Analysis of Existing Western Slope, page 7: This section states: *"One of the RD tasks is to further document the history and stability of the existing western slope".* Replace "further document the history and stability" with "determine the long-term stability."

77. Section 6.0 Analysis of Existing Western Slope, page 6: This section states: *"If additional documentation of slope stability is warranted, a geotechnical sampling investigation may be implemented." Revise to* add *"a separate work plan will be developed for approval to implement a geotechnical sampling investigation"* after *"warranted,"* and delete *"a geotechnical sampling investigation may be implemented."*

78. Section 7.0 Geotechnical Testing of Potential Borrow Areas, page 8: Revise this section based on prior comments #47 and #48.

COMMENTS ON THE REMEDIAL DESIGN
Health and Safety Plan (HASP)
WEST LAKE LANDFILL SITE, OPERABLE UNIT 2 (OU-2),
Bridgeton, Missouri, June 11, 2019

79. Revise the Health and Safety Plan, or HASP, to include an Activity Hazard Analysis, or AHA, or Job Safety Analysis, or JSA, for each specific task such as mobilization/demobilization, drilling, working around heavy equipment, sampling, IDW management, decon, sample management, and all other definable features of work.

80. Revise the HASP to clearly indicate if there are concerns of encountering radioactive material during performance of OU-2 RD field work. If yes, provide detailed procedures on managing and/or eliminating the exposure concerns.

81. Revise the HASP to clearly indicate if there are concerns of encountering hazardous materials/waste. If yes, provide procedures for administrative and/or engineering controls, such as use of personal protective equipment, etc. to eliminate or minimize exposures.

82. Revise the HASP to include the Safety Data Sheets for any chemicals brought on site (sample preservative, diesel fuel, bug repellent, decon chemicals, etc.)

83. Revise the HASP to include appropriate health and safety forms such as daily tailgate safety meeting forms, accident reporting forms, and any other safety-related forms used on a regular basis.

84. The EPA suggest that at least two workers on-site should have current First Aid and CPR certifications during filed work associated with the RD.

85. Revise the HASP to identify an on-site rally point in case of inclement weather. Further, the EPA suggests that if the work conducted at the Inactive Sanitary Landfill could be supported by the site-associated Incident Management Plan, or IMP, that the IMP be briefly discussed and referenced within the HASP.