REGION 7
LENEXA, KS 66219

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

Dear Mr. Rosasco:

On July 3, 2025, Parsons submitted the revised Confirmation Sampling and Analysis Plan (CSAP) for the West Lake Landfill on behalf of the West Lake Landfill Operable Unit 1 (OU-1) Respondents in accordance with Section 3.9 of the Remedial Design May 2025 Modified Statement of Work (SOW). The U.S. Environmental Protection Agency has completed our review of the CSAP and are approving this deliverable with modifications and conditions. While the EPA appreciates the efforts that were made to respond to the EPA's comments, several responses were either not incorporated into the CSAP or were insufficient. Attached to this letter is a list of the EPA's required conditions and modifications that are generally organized by the comment they are associated with.

The EPA expects the confirmation sampling to proceed in accordance with the previously estimated schedule and the SOW. The modified version of the CSAP should be submitted to the EPA within 30 days of receipt of this letter. Feel free to contact me with any questions or concerns by phone at (816) 604-0546 or by email at mahler.tom@epa.gov.

Sincerely,

THOMAS MAHLER

Digitally signed by THOMAS MAHLER
Date: 2025.07.18 13:41:56 -05'00'

Tom Mahler
Remedial Project Manager
Federal Facilities & Priority Sites Section
Superfund and Emergency Management Division

cc: Ryan Seabaugh, Missouri Department of Natural Resources

30831246

Comment 5.a.

The EPA accepts revisions made to the CSAP in response to this comment. However, a condition of the EPA's approval is that the boundary of any DU subarea without any confirmation samples may not be used to limit or define a modified excavation extent associated with an adjacent or nearby DU that has an exceedance.

Comment 5.b.

The EPA appreciates the new table that was added to document the surface area of top/bottom statistical decision units. However, a condition of the EPA's approval is that a similar table listing the surface areas associated with the perimeter statistical units be added to the final version of the plan to provide documentation that all the statistical decision units were less than the 2,000 square meter maximum established in the 2018 RODA.

Comment 14

If gamma exceedances at a confirmation sampling location in statistical DUs require the excavation to be expanded to include intervals from 0 to1 ft. BDID and/or 11 to 12 ft BDID, then there would be no core material remaining to collect a sample and this would result in less than the minimum 5 samples required for a statistical DU. Excavation surfaces established in the Revised Excavation Plan from 0 to 1 ft. BDID and 11 to 12 ft. BDID were excluded from the confirmation sampling program because there can be no additional RIM above the ground surface and excavation below 12 feet BDID is generally not required per the 2018 RODA. Therefore, inclusion of revised excavation surfaces in statistical DUs from 0 to1 ft. BDID and/or 11 to 12 ft BDID would be inconsistent with how the DUs were defined. Further, incorporating these excavation areas into the statistical evaluation process and assigning RIM concentrations to confirmation sampling locations above or below these areas at 0 pCi/g or 30.4 pCi/g, as proposed, would have the net effect of skewing the statistics, potentially making the DU more likely to pass. This is not acceptable.

An alternative approach to resolve such instances would be to collect a sample from an alternative boring location within the DU where the excavation does not extend to the surface or down to 12 ft BDID. However, the EPA understands such an approach may require additional borings to be collected from top and bottom DUs which could extend the time to complete the confirmation sampling program and delay the completion of the remedial design.

Therefore, the EPA is requiring a balanced approach to resolve this issue which would include the following:

1. If a core gamma exceedance or combination of confirmation sampling results require the excavation to extend to the surface (0 BDID), a fifth surface sample will be collected from one of the alternative borings established for that statistical DU or another location within the DU in the event that the alternative borings cannot provide a suitable surface sample. The statistical tests will then be completed with the new replacement sample and the remaining original samples collected from that DU.

2. If a core gamma exceedance or combination of confirmation sampling results require the excavation to extend to 12 ft BDID, a surrogate value of 52.9 pCi/g will be allocated to those confirmation sample location(s), and the statistical tests will be completed accordingly.

3. Alternatively, EPA would also accept treating the remaining borings in the DU as pass/fail borings which does not require statistical testing, and no additional samples would be necessary.

Therefore, modify the text in the third bullet for "*Inner DU Borings*" on page 12 as follows, "*For an upper DU boring with an exceedance in the 0 to 1 ft BDID interval, the location around the boring will be incorporated into the excavation and a sample from 0 to 1 ft BDID will be collected from one of the alternative boring locations listed in Table 2.7 or elsewhere within the DU if there are logistical issues at the alternative boring locations. This is appropriate because the area around the confirmation boring that was "stepped up" to the 0-1 ft interval does not need any further confirmation and is no longer part of the DU. Alternatively, the remaining borings in the DU may be treated as pass/fail borings such that statistical testing is no longer required, and no additional sample will be collected.*"

In addition, modify the text in the fourth bullet by replacing "*30.4 pCi/g (average of 7.9 and 52.9 pCi/g)*" with "*52.9 pCi/g*" and deleting the sentence that starts with "*This is justified…*"

So that the CSAP is consistent, also modify step 3 for the "*Upper DU – Failed Sample*" portion of Section 4.1.2 by adding the following text after "*will be required*", "*if the remaining samples are evaluated on a pass/fail basis. Otherwise, a sample from 0-1 ft BDID will be collected from one of the alternate boring locations listed in Table 2.7 and the DU will be re-evaluated by the same process discussed in Section 4.1.1 and Worksheet #37A of the QAPP using this new sample as a replacement for the original location.*"

Comment 18

Modify the second bullet in Section 3.1.2.7 as follows, "*RIM >52.9 pCi/g was delineated laterally by soil borings 8-2A2-159-E, 8-2A2-160-C, 8-2A2-159-B, and 8-2A2-158-B that did not contain RIM >52.9 pCi/g.*"

Comment 19

The second bullet in Section 3.1.2.8 was not changed even though additional samples were proposed from the borings listed in this bullet (8-2A2-149-A, 8-2A2-146-A, 8-2A2-151-A, and 8-2A2-154-A) to laterally delineate the extent of RIM greater than 52.9 pCi/g. In addition, the newly added third bullet contradicts itself by stating "*the lateral delineation borings listed above had no recovery from 1 ft to 1.5 ft below gravel/asphalt*" but then goes on to state that a sample from this depth "*is proposed from 8-2A2-149-A, 8-2A2-146-A, 8-2A2-151-A, and 8-2A2-154-A*". Therefore, modify the section by deleting the last two bullets in Section 3.1.2.8 and add this text as a replacement bullet, "*RIM >52.9 pCi/g is estimated to extend laterally from 8-282-150-A out to borings 8-2A2-154/8-2A2-154-A to the west, 8-2A2-151/8-2A2-151-A to the south, 8-2A2-146/8-2A2-146-A to the east, and 8-2A2-149/8-2A2-149-A to the north. However, none of these borings have sample results from 1 to 1.5 ft below gravel/asphalt.*"

Comment 20.a.i

CSAP boring A1-BCB-241 was moved to the boundary between MEA B.2b and B.2c rather than the boundary of B.2c and B.2d as requested. The new location is accepted; however, a condition of the EPA's approval is that if RIM is identified in either A1-BCB-241 or A1-PCB-160, any step-out boring(s) must at least include a boring on the boundary between MEA B.2c and B.2d to confirm the estimated vertical extent of 7.9 pCi/g associated with these two areas.

Comment 23

The newly added text to explain the western boundary of MEA B.2c includes a statement that it was established "*by following the directional path between borings A1-PB-110-F…and A1-SB-161…*" However, A1-SB-161 is located nearly 200 feet away from A1-PB-110-F within the Area 1 landfill and multiple borings with RIM > 7.9 pCi/g are present significantly closer to A1-PB-110-F. The EPA acknowledges that the line between these two borings may have been used to estimate the proposed boundary but there is no logic or evidence to support that this line is a reasonable estimate for the western extent of RIM. Nevertheless, the EPA will accept the proposed boundary with one modification and one condition.

Modify the newly added bullet describing the western boundary of MEA B.2c by replacing it with the following, "*The western boundary of MEA B.2c was generally estimated midway between A1-PB-110-I (analytical results less than 7.9 pCi/g) and A1-PB-110 (within the non-zero nugget modeled RIM shell [>52.9 pCi/g]).*"

A condition for the EPA's approval is that a step-out boring must be collected from the southwest corner of MEA B.2c if RIM is identified in A1-BCB-240 in addition to any other step-out boring.

Comment 24

No revisions were made to the text in the second bullet describing how the vertical extent of RIM between 7.9 and 52.9 pCi/g in MEA B.2d was defined. Comment 24 described the remaining uncertainty of the depth of RIM associated with 1015S because of recovery issues and non-standard sampling protocols associated with A1-PB-158. The comment also referenced comment 95 (d) from EPA's 90% RD comment letter which describes this non-standard sampling in more detail. The bullet, as written, suggests that the result from the 4-ft composite sample in A1-PB-158 provides evidence that RIM is not present from 0 to 4 ft. BDID which is misleading. Therefore, modify this bullet by adding the following sentence after the sentence describing boring A1-PB-158, "*However, recovery from the 0 to 2 ft interval of this borings was less than 50% (10 inches) and the recovery from the 2 to 4 ft interval was less than 25% (4 inches). Therefore, only a small portion of this 4-ft interval was actually sampled and because of the poor recover there is also some uncertainty associated with assigning specific depths to the material that was able to be collected.*" In addition, delete the words, "*based on the results from A1-PB-158*" from the last sentence of this bullet.

Lastly, a condition of the EPA's approval is that if RIM is identified in either A1-BCB-242 or A1-BCB-243, an additional step-out boring will be collected near surface sample 1015S and a sample will be collected from 1 to 2 ft. to confirm the estimated vertical extent of RIM in MEA B.2d around 1015S.

Comment 25.a

The conceptual site model for Lot 2A2 and the adjacent toe of the Area 2 landfill includes reports that surface soils on Lot 2A2 may have been scraped and pushed towards the toe of the Area 2 landfill. Based on these reports, contaminated soils previously present on Lot 2A2 may have been consolidated onto the area along the boundary of Area 2 and therefore RIM may not be uniformly distributed within MEA B.4., which appears to be accurate based on the previous sampling results.

The EPA acknowledges that data evaluations already completed for samples collected on Lot 2A2 demonstrate that some DUs do not have radionuclides above background while others require some

excavation. However, those evaluations did not consider any of the previously collected samples from MEA B.4 and nothing prevents the RIM known to be in MEA B.4 from extending across the property line. It is therefore appropriate and necessary to ensure these Area 2 RIM occurrences, which may be associated with disturbance and consolidation of RIM that is different than that remaining on Lot 2A2 areas, are adequately delineated, especially since this area is adjacent to the landfill property boundary.

Therefore, a condition of the EPA's approval is that either 1) the boundary of MEA B.4 be expanded out to half the distance to the nearest Lot 2A2 borings with RIM less than 7.9 pCi/g or 2) four shallow confirmation borings shall be collected at the existing MEA boundary in the vicinity of surface soil samples AA01S, AA03S, AA04S/S10, and AA05S to confirm the lateral extent of RIM from 0 to 1 feet BDID. If excavation in Lot 2A2 is already occuring up to this MEA B.4 boundary and depth at any of these locations, the associated confirmation boring will not be required for that location. As previously stated in comment 25.a, care should be taken when collecting these samples to identify the original surface below the NCC.

Comment 27

The EPA notes that the UMTRCA cover extent depicted on Figure 3.14 has been expanded slightly outside the boundary of MEA B.5 from what was submitted in the previous draft CSAP without any explanation. Because this is an expansion, the EPA accepts this change. However, key design concepts such as extent of RIM or extent of the UMTRCA cover should generally remain consistent between design deliverables. A condition of the EPA's approval is that future design deliverables must include the rationale for changes to the extent of RIM, MSW, and the engineered cover.

The only changes made to the CSAP in response to comment 27 were to delete the bullet which previously stated the southeastern extent of this MEA would be detailed and described in the future (100% RD) and the single confirmation boring proposed for this MEA was moved approximately 15 feet to the southeast. No explanation was provided for why the southern boundary of MEA B.5 was significantly changed from what was presented in the 90% RD without any new samples to define this portion of the boundary. The CSAP no longer includes any text to define the newly proposed southeastern boundary of MEA B.5b. In addition, no new boring was proposed to confirm the southeastern boundary. Therefore, the response and changes to the CSAP do not address the comment.

Nevertheless, the EPA will accept the confirmation sampling proposed for MEA B.5b along with the following additional modifications to the CSAP. First, the bullet defining the southeastern extent must be added back to the CSAP but with the following text, "*The southern extent of secondary depositional RIM <52.9 pCi/g in MEA B.5 was previously defined by A1-PB-104-A_PZ-112 in appendix A.1.D of the 90% RD.*" Second, add these two sentences to the single sentence paragraph after these bullets. "*IS-BCB-246 along with ISL-EA-186-K, which is proposed for Cover Design Support Area 3, will be used to confirm the newly proposed boundary for MEA B.5b as depicted in Figure 3.14. If RIM is identified in either of these borings, the previous southern boundary of the MEA as defined in appendix A.1.D of the 90% RD will be used when determining step-out boring locations.*"

Comment 29

While the text changes made to Section 3.2.2.6 of the CSAP do not sufficiently address comment 29, some of the text in the response to the comment provides information that should have been included in the plan. Also, the EPA is requiring that the single proposed confirmation boring for MEA B6, IS-BCB-247, be sampled at additional depths beyond what is listed in table 3.6 to address the data gaps in the borings used to estimate the extent of RIM in this MEA. Therefore, the EPA is requiring modifications to the CSAP as stated below.

First, add the following text after the four bullets which list the borings that define the lateral extent of RIM in MEA B.6a at a depth of 3 to 4 ft BDID surrounding boring ISL-EA-205-B, "*No samples could be collected from 3 to 4 ft BDID in any of these four borings because of poor recovery, but continuous downhole gamma data is available. In addition, the highest downhole gamma data in these borings were measured at the same depth as analytical sample results with combined thorium and combined radium <7.9 pCi/g. Therefore, the downhole gamma data at 3 to 4 ft. BDID in these borings is lower than the measurements taken at the depths where samples indicate no RIM is present. While not equivalent to a laboratory analyzed sample, this provides some indication that RIM is unlikely to be present at 3 to 4 ft. BDID.*"

Second, add the following text to the second to last paragraph in the section immediately after the newly added sentence, "*Therefore, four 1 ft samples are proposed to be collected from IS-BCB-247 starting at 1 to 2 ft (right below the detection at 0.5-1 ft BDID in ISL-EA-205) and ending at 4 to 5 ft. Depending on the results, these samples will potentially provide vertical delineation of RIM below ISL-EA-205-B at 3 to 4 ft, vertical delineation of the RIM below ISL-EA-205 at 0.5 to 1 ft which will also be applied to the RIM estimated to the east of ISL-EA-205, and lateral delineation of the RIM to the east of ISL-EA-205-B.*"

Lastly, modify table 3.6 by adding two additional sample depths at 2 to 3 ft BDID and 3 to 4 ft BDID.

Comment 31.d

A condition of the EPA's approval is that if RIM >52.9 pCi/g is identified in A2-PBC-077, a step-out boring will be collected between the non-zero nugget model extent of RIM >52.9 pCi/g associated with A2-SB-168 and the larger excavation to the west. Further, if the statistical perimeter DU associated with A2-PBC-077 passes the statistical testing criteria, no expansions to the excavation are required even if RIM >52.9 pCi/g is present in A2-PBC-077 unless RIM >52.9 pCi/g is also found in the new step-out boring.

Comment 32.b

Table 2.6 is inconsistent with Table 3.6 regarding the sampling depths from archived core for A1-SB-072. The EPA is approving the sampling depths listed in Table 3.6 which are 0 to 1 ft BDID and 1 to 2 ft BDID. Therefore, modify Table 2.6 by changing the sample start depth for A1-SB-072 from 1.34 to 1.

Comment 33.a

The following are conditions of the EPA's approval of the confirmation sampling proposed for this discrepancy:

1. Step-out borings and/or excavation extensions in response to confirmation samples that exceed 52.9 pCi/g associated with DS-32 must account for the uncertainties present in the nearby

borings such as A1-SB-056 and A1-TH-082 caused by limited core recovery, elevated gamma screening measurements, and the vertical distance between analytical samples.

2. If samples exceed 52.9 pCi/g in A1-BCB-222 associated with UA-3 or in A1-BCB-209 associated with DS-32 or in A1-PCB-151 associated with DU A1-PR-48, a step-out boring in the vicinity of A1-TH-086 where the OK Model and Zero Nugget models indicate RIM greater than 52.9 pCi/g may be present between 0 and 8 ft. will be collected.
3. A Sample must be collected from A1-BCB-209 or A1-BCB-210 at the depth associated with the discrepancy sample in WL-106A-CT. In addition, the excavation around WL-106A-CT must be extended to include the discrepancy sample if RIM greater than 52.9 pCi/g is found at that depth in A1-BCB-209 or A1-BCB-210. This is because no other confirmation sampling is proposed for the area of RIM greater than 52.9 pCi/g in the vicinity of WL-106A-CT that would support resolving this data discrepancy.

Comment 33.b

The EPA notes that the DS-34 area overlaps an unusual and uniquely shaped portion of the 52.9 pCi/g RIM shell. The DS-34 area also overlaps MEAs B.2b, B.2c, and B.2d. Further complicating this area is that the proposed edge of the UMTRCA cover system is south of all of these items which requires all RIM outside the cover boundary to be excavated. Therefore, it is critical that the RIM >52.9 pCi/g in this area be well defined so that it can be excavated and shipped off-site for disposal separately from the RIM <52.9 pCi/g. Because of this, additional step-outs beyond what may be reasonable for other discrepancy areas will be necessary for this area if RIM >52.9 pCi/g is found in either A1-PCB-160 or A1-BCB-241.

A condition of the EPA's approval is that the Respondents will provide a presentation to the EPA before the end of the confirmation sampling field work detailing how the proposed confirmation borings are intended to be used to inform the design of the excavation in this area. The presentation must also specifically address the discrepancy sample since this RIM must be excavated as it is located outside the UMTRCA cover. In addition, if RIM >52.9 pCi/g is found in A1-PCB-160 or A1-BCB-241, the Respondents will provide a similar presentation to the EPA before the end of the confirmation sampling field work that incorporates proposed step-out borings. These presentations will provide the EPA with information necessary to fully evaluate the adequacy of the confirmation sampling proposed in this area.

Comment 34.e

The EPA has two conditions for our approval of the confirmation sampling associated with DS-35. First, samples from A1-BCB-212 must be collected at 0 to 1 ft and 4 to 5 ft to align with the depths of RIM identified as discrepancies in WL-118-MH and WL114-MH. These samples may replace two of the three random depth samples that table 3.6 currently requires to be collected from A1-BCB-212. Second, either 1) add an additional confirmation boring at the southern corner of the estimated RIM extent associated with DS-34 with samples to be collected at the same depths as A1-BCB-212 or 2) archived core from WL-114-CT must be sampled at 0 to 1 ft and 4 to 5 ft. This is because the concentration of RIM associated with the discrepancy in WL-114-MH is 7,868 pCi/g (more than 100 times the excavation criteria). Tables 3.4, 3.5, and 3.6 must also be updated to reflect whichever of these two changes is selected; however, the EPA is not requiring Figure 3.16b to be updated.

Comment 35.b

No text was added to justify why a confirmation boring is not needed north of CD-EA-190-B to delineate RIM greater than 52.9 pCi/g in that direction. Therefore, the following is a condition of the EPA's approval:

Implement one of the following two choices,

1. Extend the excavation associated with DS-29 out to the north to be consistent with the existing boundary of polygon 41 established in the CDL Excavation Plan and revise Figure 3.16a accordingly, or

2. Add a confirmation boring to the north of CD-EA-190-B at the proposed boundary of the excavation associated with this discrepancy and collect four 1 ft samples between 0 and 4 ft. Revise tables 3.4, 3.5, and 3.6 accordingly; however, the EPA is not requiring Figure 3.6a to be updated.

Comment 41

The EPA acknowledges that the CSAP was not changed to reduce the complexity of the statistical decision units as recommended. Therefore, the EPA expects that the Respondents will make decisions about whether and where step-out borings are needed based on a variety of factors including comparing the cost of additional borings against the cost of excavation expansions. In addition, these confirmation sampling decisions will ultimately impact critical aspects of the OU-1 Remedial Design including things like the locations for excavation, the extent of the engineered cover system, and the grading plans. Because these design changes will not be provided to the EPA until the updated drawings are submitted at the end of the design process, it is critical that the EPA is provided the confirmation sampling results and the information the Respondents used to determine that the confirmation sampling program is complete before these drawings are completed. This will allow the EPA to provide timely feedback and prevent unnecessary and potentially significant schedule delays that would result if issues were not identified until after the modified design is complete.

Therefore, a condition of the EPA's approval of the CSAP is that lab reports, including electronic data deliverables containing CSAP results, that are submitted to the Respondents from the laboratory be provided to the EPA within 5 business days of Respondents (or their contractor's) receipt of the results. In addition, weekly Field summaries (instead of daily summaries provided during the Design Investigation) should be submitted to EPA documenting the confirmation sampling work completed and these summaries should include a list of any confirmation sampling borings that were found to have core gamma that exceeds the thresholds established in the CSAP. This list should also include the specific depth and core gamma result associated with each exceedance.

Comment 48

The EPA agrees with the proposed evaluations of data that fails the QC criteria. However, the purpose of QC criteria is to establish the quality of data necessary to answer the questions defined by the sampling objectives. Therefore, samples that fail the QC criteria generally are not suitable to determine whether RIM extents have been confirmed. Modify step 2 of Worksheet 37A by adding the following sentence after the four bullets, "*Data that fails the QC criteria will not be used for confirmation decisions unless specifically approved by the EPA.*"

Comment 49.a

While text was added to acknowledge the potential for normality violations, no firm criteria to identify normality severe enough to preclude the use of the t-test was established. Therefore, modify the last sentence of the first paragraph of Step 3 as follows, "*The Pearson's coefficient of skewness defined by |3*(mean-median)/standard deviation| will be used as an objective measure of non-normality. If the coefficient exceeds 1.92, then the t-Test is considered unreliable and so the Sign Test will determine whether the DU passes."* The EPA has selected a coefficient of skewness of 1.92 because it corresponds to the 99^{th} percentile of the absolute value of the Peason's coefficient of skewness if n=5 and the true distribution of Thorium concentration in the DU is N(26.5, 16).

Also, modify the last sentence in step 11-4A on page A-10 of the QAPP addendum by replacing it with the following, "*Differences between the mean and the median will be evaluated using the Pearson's coefficient of skewness as described in worksheet 37A to determine whether the t-test can be relied upon to pass DUs.*"

Comment 49.b

Modify step 3 in worksheet 37A by deleting the word "*paired*" from the first sentence of the second paragraph.

Comment 51

Consistent with the EPA's modifications related to comment 14 above, modify the last sentence of Step 5 on page A-17 of the QAPP as follows, "*As related to the step up process for passing a DU, replacement samples will be collected from the 0 to 1 ft BDID at alternate boring locations if the excavation must extend to the surface in one of the original boring locations based on the results of the statistical testing. Statistical testing will then be performed with the new sample to resolve the remainder of the DU. However, for the step down process, a value of 52.9 pCi/g will be ascribed to the missing samples for the lower DUs and the tests will be completed accordingly. Otherwise, the remaining borings in the statistical DU will be evaluated on an individual pass/fail basis".*