UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
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Lenexa, Kansas 66219

AUG 0 4 2016

Mr. Paul V. Rosasco
Project Coordinator
Engineering Management Support, Inc.
7220 West Jefferson Avenue, Suite 406
Lakewood, Colorado 80235

Dear Mr. Rosasco:

The U.S. Environmental Protection Agency is providing this letter to provide an overview of the status of various studies' work plans and related deliverables developed to support the EPA's evaluation of the remedy decision for the West Lake Landfill Operable Unit-1, Bridgeton, Missouri. This work has been performed by Cotter Corporation (N.S.L.), Bridgeton Landfill, LLC., Rock Road Industries, Inc., and the United States Department of Energy (i.e., potentially responsible parties) in response to the EPA's request for additional work pursuant to Paragraph 51 of the Administrative Order on Consent, EPA Docket No. VII-93-F-0005. These efforts will ultimately be incorporated into the Final Feasibly Study in accordance with the May 8, 2016, Abbreviated Work Plan for Remedial Investigation Addendum and Final Feasibility Study, approved by the EPA on May 18, 2016.

If you have any questions regarding the contents of this letter or need further clarification, please email or contact me at (913) 551-7611.

Sincerely,

Brad Vann
Remedial Project Manager
Missouri/Kansas Remedial Branch
Superfund Division

Enclosure

cc: Ryan Seabaugh, MDNR

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Superfund

Enclosure

As stated in the December 9, 2015, Statement of Work for Remedial Investigation Addendum and Final Feasibility Study (SOW), the Final Feasibility Study (FFS) shall be a comprehensive document, incorporating the elements of and updating as appropriate the June 2006 Feasibility Study Report and September 2011 Supplemental Feasibility Study. The SOW and final Remedial Investigation and Feasibility Study (RI/FS) Work Plan further directed the inclusion of information associated with and results from multiple studies, and any corresponding revisions, that have been or will be performed by the Respondents and Federal Respondent since 2006. These studies include the following:

- Discount Rates and Cost Estimates
- Alternate Covers Designs Evaluation
- Evaluation of the Use of Apatite/Phosphate Treatment Technology*
- Alternative Excavation Volume for Area 2
- Partial Excavation Alternatives
- Fate and Transport Evaluation*
- Evaluation of Possible Effects of Climate Change (Tornado) on Integrity of the ROD Selected Remedy
- Evaluation of Risks Associated with Subsurface Smoldering Events
- Bird Mitigation Analysis**
- Radon Flux Calculations***

**Work associated with these studies will be considered within relevant components of the OU1 RI/FFS and ultimately incorporated into a Groundwater Investigation which shall be addressed in a Statement of Work that will be transmitted to the parties under separate cover.*

***Studies identified under the preconstruction order in preparation for the construction of an Isolation Barrier system but also relevant to site remedy.*

****Elements associated with the Isolation Barrier Analysis (Appendix A) and relevant to human health exposure risks and reevaluation of the Baseline Risk Assessment.*

The following sections provide our current understanding of the status of these items as well as expectations for the incorporation of these items into the Final Feasibility Study, where appropriate:

1. **Discount Rates and Cost Estimates Evaluation (deliverable)** - This evaluation was related to revising the cost estimates of the previous remedial alternatives based upon two different discount rates. The EPA approved the revised work plan on September 19, 2014. The discount rate draft deliverable was received by the EPA on October 31, 2014. The Final RI/FS Work Plan allowed for the results of the October 31, 2014, evaluation to be incorporated into the final FFS for the EPA's review.

   In accordance with the EPA's July 2000 "Guide to Developing and Documenting Cost Estimates During the Feasibility Study" (OSWER Directive 9355.0-75), in addition to developing a present-value cost estimate for the various remedial alternatives using a 7% discount rate in the FFS, the Potentially Responsible Parties (PRPs) may propose the use of a higher or lower discount rate. Any

proposal for a different discount rate must be accompanied by a specific justification and a sensitivity analysis of the impacts of the discount rate assumption on the present value costs to support such a proposal. Please note that consideration of the Department of Energy as a PRP should not be the sole justification for the proposal of a different discount rate.

In addition, cost estimates associated with the various remedial alternatives in the FFS should not be presented as fiscally-constrained, as previously requested by the EPA and subsequently presented by the PRPs in the 2011 Supplemental Feasibility Study.

2. **Alternative Covers Design Evaluation (deliverable)** – The EPA approved the revised work plan on September 19, 2014. The alternative landfill cover evaluation draft deliverable was received by the EPA on January 27, 2015, which evaluated a hybrid geo-synthetic clay liner (GCL) as compared to a compacted clay liner as included in the 2008 Record of Decision Selected Remedy for OU1. This cover design evaluation was provided by the PRPs in response to the EPA's request to evaluate a hybrid cover system consistent with an UMTRCA/Subtitle C cover. As set forth in the Final RI/FS Work Plan, the results of the evaluation documented in the January 27, 2015, deliverable shall be incorporated into the FFS for the EPA's review.

3. **Evaluation of the Use of Apatite/Phosphate Treatment Technology (work plan)** – On October 31, 2013, the EPA received the revised work plan on RIM treatment technologies (primarily apatite) from the PRPs. After internal review and discussions with the PRPs, the EPA approved the work plan, as well as, directed the parties to perform a comprehensive literature review of possible treatment technologies. In an email to Paul Rosasco on March 20,2015, the EPA *"...recommended that additional literature research be undertaken to identify all relevant literature pertaining to the reduction in mobility of Radiologically Impacted material (RIM) in landfill environments of appropriate geochemical conditions (solubility and sorption). More specifically, the additional literature research should include various stabilization agents, for example, but not limited to (phosphates, carbonates, sulfates, sulfides) under current and projected subsurface geochemical conditions of pH and Eh at the West Lake landfill. The identified site conditions should dictate the best chemical treatment options based on waste, RIM and geochemical conditions to achieve minimum RIM component mobility.")*

   In accordance with the Final RI/FS Work Plan, following the completion of this literature review, the parties shall incorporate relevant information into the OU-1 FFS for the EPA's review.In addition, as specified in the Final RI/FS Work Plan, information from this evaluation shall also be considered, and as appropriate, be included in future groundwater (OU-3) RI/FS activities.

4. **Alternative Area 2 RIM volume estimates (work plan)** – On July 23, 2015, the EPA received a revised work plan for Alternative Area Excavation Depths and Volumes. The Alternative Area 2 RIM volume estimate evaluation was originally intended to address questions regarding the presence of RIM at the bottom of WL210 and WL235. During a May 5, 2015, technical meeting regarding additional characterization in Area 1 and Area 2, the PRPs agreed to re-drill borings WL210 and WL235. Area 2 RIM volume estimates are now being calculated based upon the data generated from the additional investigations of OU-1. In accordance with the Final RI/FS Work Plan, no further submittals related to the July 23, 2015, work plan for this item is required.

5. **Partial Excavation Alternatives (work plan)** – In September 2014, the PRPs met with the EPA and the Missouri Department of Natural Resources, and were subsequently directed to submit

preliminary calculations for three specific partial excavation scenarios (two based on concentration thresholds and one based on depth). The preliminary calculations were received by the EPA on October 31, 2014, and comments were sent to the PRPs on December 19, 2014. The EPA and PRPs had further technical discussions on January 23, 2015.

On April 20, 2015, the EPA sent the PRPs a letter requesting additional RIM characterization in Areas 1 and 2 to better define the extent of RIM in OU1. The additional RIM characterization work has been completed and is being used to support revised calculations of the volume of RIM and overburden in Areas 1 and 2. The revised volume calculations will be used to support the evaluations of partial and full excavation remedial alternatives in the FFS.

The Final RI/FS Work Plan provides specific information regarding the excavation scenarios to be evaluated in the FFS. Therefore, no further submittals associated with the July 23, 2015, work plan related to partial excavation alternatives are required. In addition, the Final RI/FS Work Plan acknowledges that the Respondents have the ability to propose a different depth to be used for one of the partial excavation alternatives once site data became available and further evaluated. The EPA is prepared to further discuss other possible alternative depth based scenarios in the next few weeks as a part of the overall discussion of the PRPs' development of the draft FFS.

6. **Fate and transport evaluation (work plan)** – The EPA received a revised work plan on September 4, 2014, and provided comments to the PRPs on December 19, 2014. The PRPs submitted a revised work plan to the EPA on July 31, 2015. Recently, the EPA made a decision to pursue additional characterization and evaluation of groundwater as Operable Unit 3.

   In accordance with the Final RI/FS Work Plan, relevant portions of the fate and transport evaluations will be incorporated into the RI Addendum and the FFS for the EPA's review and approval. To further clarify, all historical groundwater monitoring data, along with the additional fate and transport data associated with the Area 1 and Area 2 Additional Characterization Work performed in 2015 and 2016, should be incorporated into the RI Addendum and evaluated in the FFS.

7. **Evaluation of Possible Effects of Climate Change (Tornado) on Integrity of the ROD Selected Remedy** – The EPA previously requested an evaluation of the effects of a tornado on the integrity of the remedial actions to be taken at the site. In October of 2013, the PRPs submitted its "Evaluation of Possible Effects of a Tornado on the Integrity of the Record of Decision – Selected Remedy for Operable Unit-1 at the West Lake Landfill." The Final RI/FS Work Plan requires applicable information from this evaluation to be included in the FFS for the EPA's review. It also requires the discussion of climate change and vulnerabilities associated with extreme weather events in the evaluation of the long term effectiveness of the remedial alternatives. Please see the EPA's "Climate Change Adaptation Technical Fact Sheet: Landfills and Containment as an Element of Site Remediation (EPA, 2014c).

8. **Evaluation of Risks Associated with Subsurface Smoldering Events (SSE)** – On several occasions the PRPs previously provided the EPA with risk evaluations, correspondence, and related documentation of the potential effects of an SSE coming into contact with the RIM in OU-1 Area 1. The Final RI/FS Work Plan requires the PRPs to include discussion and consideration of the occurrence of an SSE and evaluation of an Isolation Barrier (IB), including a brief discussion of pending/on-going IB-related design and field work in the FFS for the EPA's review.

In the FFS, the PRPs should evaluate potential risks associated with a subsurface smoldering event (SSE) reaching OU1 from the Bridgeton Landfill portion of OU2, or a new SSE originating within OU1. This evaluation shall include a qualitative assessment that takes into account the potential effects of an SSE with regards to RIM should one occur, and the consequences to proposed remedies, including the potential for radon and particulate releases.

9. **Radon Flux Calculations** - Radon Flux Calculations were provided to the EPA on October 10, 2014 as an appendix to the PRPs' Isolation Barrier Alternatives Analysis. On March 10, 2015, the EPA provided comments to the PRPs, and a response to those comments was received on June 9, 2015. Since that time, the PRPs collected additional radon flux samples from the surfaces of Area 1 and Area 2 in the spring/summer of 2016. In accordance with the Final RI/FS Work Plan, this information is to be considered, and as appropriate, be incorporated into the Baseline Risk Assessment, RI Addendum, and the FFS for the EPA's review.

10. **Bird Mitigation Analysis Plan** - On May 15, 2014, the PRPs provided to the EPA, a revised Bird Mitigation Plan which was approved on June 24, 2014. Additionally on October 10, 2014, the PRPs provided additional input on Bird Control Issues per the Isolation Barrier Preconstruction Order signed April 15, 2014. The City of St. Louis/Lambert Field Airport provided written comments on the bird mitigation information on November 19, 2014, and those comments were provided to PRPs. In association with the previous documents and in accordance with the Final RI/FS Work Plan, the PRPs shall include an evaluation of potential technologies to control bird populations based on the methods described in the draft Bird Mitigation Plan developed by LGL in the FFS.