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

JUL 15 2016

Mr. Paul Rosasco, P.E.
Engineering Management Support, Inc.
7220 West Jefferson Avenue, Suite 406
Lakewood, Colorado 80235

Re: The EPA's Comments on the Draft Inert Gas Injection Work Plan for Hot Spot Remediation Bridgton Landfill, Bridgeton, Missouri dated May 20, 2016

Dear Mr. Rosasco:

The U.S. Environmental Protection Agency is providing the enclosed comments on the above referenced document prepared by SCS Engineers Inc. This work plan was submitted to the EPA for review and approval in accordance with paragraph 35(a) of the North Quarry Administrative Settlement Agreement and Order on Consent for Removal Actions at the West Lake Landfill Superfund Site, EPA Docket No. CERCLA-07-2016-0005.

Please address these comments through document modification, as required by paragraph 37b of the North Quarry Administrative Settlement Agreement and Order on Consent, and resubmit the revised document to the EPA within 14 calendar days of your receipt of this letter.

If you have any questions pertaining to this letter, please contact me by phone at (913) 551-7416; by written correspondence to my attention at the EPA, 11201 Renner Boulevard, Lenexa, Kansas 66219; or by email to mahler.tom@epa.gov.

Sincerely,

Tom Mahler

Tom Mahler
On-Scene Coordinator
Missouri/Kansas Remedial Branch
Superfund Division

Enclosure

cc: Mr. Ryan Seabaugh, MDNR

**EPA Comments on the Draft Corrective Action Measures**
**Inert Gas Injection Work Plan Hot Spot Remediation**
**Bridgton Landfill, Bridgeton, Missouri**
**May 20, 2016**

1. **Page 2, Section 2.0**: "Therefore, inert gas injection technology is not appropriate for large, deep, area-wide reactions nor for conventional landfill fires or (SSOs) deeper than approximately 40 feet."

   Comment: The work plan needs to be revised to state the maximum depth at which the inert gas injection technology will be considered for corrective action, and what technologies or actions will be implemented if a subsurface oxidation event (SSO), or other heating event is slightly or significantly deeper than this maximum effectiveness depth.

   Other portions of the work plan suggest that inert gas injection will not be used until other methods of control are attempted and the SSO is monitored for a period of time. The EPA and the Missouri Department of Natural Resources do not agree with the inclusion of a lengthy evaluation period. Additional evaluation time may allow the SSE to substantially spread and hence potentially render inert gas injection ineffective. In accordance with the North Quarry Administrative Settlement Agreement and Order on Consent, inert gas injection should be implementable within 7-days of the identification of a trigger exceedance. The work plan must be revised to be consistent with the 7-day implementation requirement of the North Quarry Administrative Settlement Agreement and Order on Consent.

2. **Page 2, Section 3.0**: "The US EPA Administrative Settlement Agreement and Order on Consent for Removal Actions (ASAOC) incorporates the following trigger values for the implementation of inert gas injection:

   - Landfill gas temperature at the well head greater than 185 ° F, or
   - Concentration of carbon monoxide in the landfill gas greater than 1500 ppm, or
   - Temperature in temperature monitoring probe (TMP) greater than 200° F."

   Comment: This bulleted list is inconsistent with the North Quarry ASAOC. Please revise the list of bullets in this section (and elsewhere as appropriate) and use the exact language as provided in the North Quarry ASAOC.

3. **Page 2 and 3, Section 3.0**: The North Quarry ASAOC clearly states: "... Respondents shall have the necessary materials available on-site or under agreement such that once the Work Plan has been approved by the EPA, it can be implemented in seven days."

   Comment: Please revise the text of the document to state that the materials and equipment needed to implement inert gas injection will be available on-site or under agreement and be implementable with 7-days of a trigger exceedance, as specified in the ASAOC.

4. **Page 3, Section 3.0**: "These trigger values are not, in and of themselves, sufficient to determine whether an SSO is present in the vicinity of the gas extraction well or TMP where they were recorded. As described below, inert gas injection is not appropriate as an initial remedial action for an SSO. The following protocol will be followed to determine whether an SSO is present. If an SSO is present, the initial remedial measures will be implemented. If the initial remedial measures are not effective, inert gas injection will be implemented."

Comment: The bulleted list provided on page 3 in Section 3.0 identifies a list of potential visual and odor related indicators (symptoms) that could be related to a developing SSO. Measuring and/or otherwise assessing and tracking the items as listed in these bullets are currently part of routine landfill monitoring and maintenance work that would be performed during routine and non-routine inspection and maintenance activities prior to exceeding the trigger values. The basis for the conclusions drawn in this statement is questionable, and the action steps do not match the intent of expedient implementation of inert gas injection (see Comment 3). The ASAOC requires inert gas injection to being within 7 days of the exceedance of the triggers. Please revise the text of the document to be consistent with the specifications in the ASAOC.

Additionally please add a decision tree-type process diagram in the IGI work plan that identifies the steps needed should trigger levels be approached or exceeded, including; regulator notifications, field actions, and other reporting requirements. The decision tree diagram should provide support for the facility Environmental Manager by including all steps necessary to efficiently and safely implement inert gas injection within 7-days, in the event inert gas injection is confirmed and deemed necessary to deploy.

5. **Page 3, Section 3.0**: "Upon a trigger exceedance, the area in the vicinity of the well or TMP will be inspected as described in Appendix D of the November 2014 Corrective Action Plan, typical symptoms of an SSO event include..."

   Comment: Routine inspections and landfill monitoring should include the investigation of typical SSO symptoms listed in Appendix D of the November 2014 Corrective Action Plan prior to, during, and after a trigger value is reached. The paragraph should be rewritten to state "In addition to the identified triggers, wells and TMPs will be inspected periodically for typical symptoms of an SSO event as described in Appendix ..."

6. **Page 3, Section 4.1**: "The Bridgeton Landfill, LLC Environmental Manager and the MDNR will actively collaborate..."

   Comment: The sentence should also include the EPA.

7. **Page 3, Section 4.1**: "Such determination will be made within four weeks of the Initial Notifications."

   Comment: This response time does not meet the intent of the ASAOC for utilization of inert gas injection. A 7-day period to confirm both temperature and carbon monoxide levels should allow the facility sufficient time to determine if immediate measures are or are not sufficient and appropriate to properly address an identified SSO. The 7-day evaluation period should also allow for investigation of the North Quarry to determine the area affected, including the area's proximity to known radiologically impacted material, with a primary objective of not allowing time for significant expansion of the SSO to occur.

   Inert gas injection is expected to begin upon determination that an SSO exists or approximately within one week from the identification of a confirmed "hot spot." The work plan also imposes limitations on the size of the area to be injected to one gas extraction well, and the depth limit of approximately 40 feet without sufficient data supporting these limitations. Inert gas injection is dependent on adequate volume and uniformity of dispersion at the impacted depth, so the limitations

imposed by the work plan need to be supported by sufficient technical information. Please provide sufficient information supporting the limitations currently outlined in the text.

8. **Pages 5 and 6, Sections 4.2 and 4.3**:

   Comment: Provide supporting information in these sections that explains how a depth of 25 feet below ground surface was chosen; how the radius of influence (15 feet) for inert gas injection was estimated; and show the calculation for the amount of CO2 required and if it based on an assumed contact time or other metrics.

9. **Page 6, Section 4.3, second paragraph**: "Liquid CO2 will be targeted for injection at pressures between 200 and 300 psi."

   Comment: Please clarify where this pressure is being measured (at the tank or injection point). In addition, this document and the related site HASP should clearly state if consideration of potential slope failure, settlement collapse, or leachate daylighting was considered; and more specifically, what measures shall be employed to protect the environment and ensure safety for equipment and personal in the event of any such occurrence (in addition to other concerns mentioned such as suffocation or contact frostbite).

10. **Page 8, Section 5.0, First Paragraph**:

    Comment: References to the Missouri Department of Natural Resources should include the EPA and this comment is the same for Appendix A, Formal Notification and Classification of the Event Section. Additionally the decision tree process diagram required in Comment 4, should include notification to appropriate contacts, including the EPA and the MDNR.

11. **Appendix A, Timeline for Local SSO Resolution**:

    Comment: Correct the spelling error, "form" should be "from."

12. **Appendix A, Things to Avoid**:

    Comment: Correct the spelling error, "stream" should be "steam."

13. **Appendix A, Classification of the Event**:

    Comment: The last two paragraphs are confusing, and it suggests that classification of the SSO is required prior to action under this work plan. If classification of an SSO moves the necessary action to different approved work plans, then all potentially applicable work plans should be referenced in this document, along with the decision points for transfer from one work plan to another and referenced within the accompanying decision tree (See Comment 4). Please amend the document accordingly.

14. **Appendix A (Appendix D), Classification of Event**:

    In addition, amend this language on "triggerable action" based on comment 4 above.

**EPA Comments on Health and Safety Plan**
**Associated with the Draft Corrective Action Measures**
**Inert Gas Injection Work Plan**
**Hot Spot Remediation**

**3.1.1 Task-Specific Potential Hazards, Job Safety Analysis, Page 16:** "If the work will be performed at a location in the North Quarry that 1) overlies the southwestern portion of Area 1, and 2) has the potential to encounter Area 1 RIM (as determined in consultation with Feezor Engineering, Inc., EMSI, and/or Auxier & Associates, Inc.), equipment/supplies will also include a break station with extra PPE supplies, hydrating fluids, decontamination equipment, radiological scanners, etc."

Comment: Due to the proximity to RIM, all intrusive actions, including actions related to Inert Gas Injection, conducted north of the north quarry high wall should assume that RIM may be encountered and utilize the applicable HASP provisions and any related SOPs for working in RIM areas.