



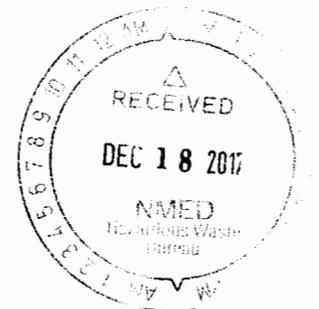
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Mr. David Cobrain
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Dr. East
Building One
Santa Fe, NM 87505



RE: Draft Technical Review Comments on the Final SS-039 – Missile Fuel Spill Area (SWMUs 165, 177, 179 & 181) Resource Conservation and Recovery Act Facility Investigation Holloman Air Force Base, New Mexico, dated October 2017

Dear Mr. Cobrain:

Attached please find draft technical review comments on the risk assessment portions of the *Final SS-039 – Missile Fuel Spill Area (SWMUs 165, 177, 179 & 181) Resource Conservation and Recovery Act Facility Investigation (SS-039 RFI)* for Holloman Air Force Base (HAFB).

Section 7.0, Risk-Based Human Health Evaluation, and subsections 7.1 through 7.5 of the SS-039 RFI do not provide the level of detail needed to determine if risk and hazard to potential receptor populations has been adequately characterized. No information is included in the text regarding risk and hazard from soil concentrations. The SS-039 RFI does reference the *Accelerated Corrective Measures Completion Report for SS-039* for this information but the RFI does not include any details regarding the elimination of the trichloroethene (TCE) source in soils, removal of the contaminated soil, and the level of residual risk and hazard attributable to post-removal soil concentrations. In addition, the evaluation of the vapor intrusion (VI) pathway does not meet the requirements for a VI evaluation as outlined in *Risk Assessment Guidance for Investigations and Remediation Volume 1* (NMED RAG) dated February 2017. HAFB has not adequately justified a qualitative approach to the evaluation and has failed to adequately characterize potential risk and hazard via the VI pathway.

The SS-039 is also inconsistent in presenting information regarding the potential for construction in the buffer area at the Lost River Basin established by the *Cooperative Agreement for Protection and Maintenance of White Sands Pupfish*. One discussion implies that construction is not specifically prohibited by the Agreement while another implies that the Agreement does, in fact, prohibit construction in the buffer area. This confusion should be eliminated in the text as the risk-based evaluation methodology will require modification if construction is possible in the buffer area.

These as well as other issues are addressed in the attached technical review comments. If you or any of your staff have questions, please contact me at (801) 451-2864 or via email at pwalton@aqsnnet.com.

Thank you,



Paige Walton
AQS Senior Scientist and Program Manager

Enclosure

cc: Brian Salem, NMED (electronic)
Joel Workman, AQS (electronic)
Mike Smith, AQS (electronic)

**Final SS-039 – Missile Fuel Spill Area (SWMUs 165, 177, 179 & 181) Resource
Conservation and Recovery Act Facility Investigation**

**Holloman Air Force Base, New Mexico
Dated October 2017**

Technical Review Comments

1. Section 7.0, Risk-Based Human Health Evaluation, pages 7-1 through 7-3. Section 7.0 and the associated subsections (Sections 7.1 through 7.5) do not include an estimate of the total residual risk [soil risk or hazard plus vapor intrusion (VI) risk or hazard] to the receptor populations addressed in the risk-based human health evaluation. A screening level estimate of total risk and hazard to industrial workers, construction workers, and residents is required by the NMED *Risk Assessment Guidance for Investigations and Remediation Volume 1* (RAG) to account for cumulative impacts on receptor populations. Revise Section 7.0 to include a screening-level estimate of total risk (additive risk from all exposure pathways, soil risk plus VI risk) for each receptor population evaluated in the human health assessment. Note that if construction within the Lost River Basin buffer area is not specifically prohibited by cooperative agreements or other controls/procedures implemented by Holloman Air Force Base (HAF B), total risk estimates should also include risks due to direct contact with groundwater [as determined for wells with depth to groundwater of 10 feet below ground surface (bgs) or less] for construction workers and residents.
2. Section 7.3.2, Soils, page 7-1. Section 7.3.2 indicates that impacted soil has been addressed at SS-039 and that soil concentrations are below NMED residential screening levels. While a reference is provided to the *Accelerated Corrective Measures Completion Report for SS-039*, a summary of the activities and results documented in this report is not included in the SS-039 RFI. It is noted that Table 3-5 of the completion report showed post removal levels of arsenic above the soil screening level. This information is needed to provide technical justification for the assertions, claims, and conclusions stated in the SS-039 RFI regarding potential risk to receptor populations. Revise Section 7.3.2 to include a summary of actions taken (e.g., removal of contaminated soil; confirmatory sampling; estimation of residual risk and hazard) at SS-039 with regard to soils and the results (e.g., comparison of confirmatory sampling results to residential soil screening levels) of those actions with regards to risk to potential receptors.
3. Section 7.3.3, Groundwater, page 7-2. The third paragraph of Section 7.3.3 describes a 100 meter buffer for protection of the White Sands Pupfish that exists on both sides of the Lost River Basin. The text states “No construction activities are expected to be performed within this buffer area.” Section 8.3, Vapor Intrusion Evaluation, implies that construction activities are prohibited by the *Cooperative Agreement for Protection and Maintenance of White Sands Pupfish*. Thus, it is unclear whether construction is specifically prohibited by the cooperative agreement that created the buffer or if HAFB has implemented other controls and/or procedures. These discussions should be reviewed and revised for accuracy and consistency. If it is possible that construction could occur within the buffer, the risk-based human health evaluation should be revised to:

- Include groundwater data from the monitoring wells within the buffer area in the evaluation of potential exposures for construction workers.
- Include locations within the buffer area as potential locations for future buildings as part of the evaluation of the VI pathway.
- Consider risks to construction workers and residents due to groundwater concentrations measured in wells within the buffer area with a depth to groundwater of 10 feet bgs or less.

Revise Section 7.3.3 for accuracy and consistency with other discussions on prohibiting construction in the 100 meter buffer area for the Lost River Basin. The revised discussion should identify the agreements, controls, and/or procedures in place that specifically prohibit construction in the buffer area. If preventive measures are not in place, revise the risk-based human health evaluation to include consideration of the three bulleted items listed above.

4. Section 7.3.4, Vapor Intrusion, page 7-3. The top of page 7-3 presents a bulleted list of four items that must be satisfied before a qualitative assessment of the vapor intrusion (VI) pathway can be performed in lieu of a more detailed quantitative assessment. The list is taken directly from Section 2.5.2.2, Potentially Complete Pathway; Qualitative Discussion, NMED RAG dated February 2017. As stated in the NMED RAG and on page 7-3 of the SS-039 RFI, all four of the listed criteria must be met before a site from which the source and associated contaminated soil have been removed can be assessed qualitatively. Only the criterion related to site concentrations and VI screening levels (VISLs) has been addressed in the SS-039 RFI. In addition, the current version of the SS-039 RFI Section does not contain the level of detail required to demonstrate that the source and associated contaminated soil has been removed from the site. Before a qualitative assessment of the VI pathway can be performed for Building 1176 and any building constructed in the future, the SS-039 RFI should be revised to include:

- A summary of the activities performed in removing the source and associated contaminated soil from the site as currently documented in the *Accelerated Corrective Measures Completion Report for SS-039*.
- The results of confirmatory sampling performed after removal of the source and associated soil contamination.
- A demonstration that minimal volatile and toxic compounds remain in the soil, soil gas, and groundwater at locations where the VI pathway is potentially complete. This can be demonstrated through comparison of confirmatory sampling results to applicable risk-based screening levels (e.g., NMED SSLs) combined with the comparisons of March 2017 soil gas results to soil-gas VISLs and April 2017 groundwater results to groundwater VISLs.
- A brief but technically sound and defensible discussion of the potential for dense/sinking vapors at locations where the VI pathway is potentially complete.
- A discussion and associated graphics (tables and/or diagrams) demonstrating that soil and soil-gas concentrations are decreasing with depth at locations where the VI pathway is potentially complete.

5. Section 7.3.4, Vapor Intrusion, page 7-3. The last paragraph of Section 7.3.4 refers to Table 14 for a comparison of soil vapor concentrations to NMED residential and industrial soil gas

VISLs. Examination of the table indicates that risk and hazard have not been calculated for the listed analytes. In addition, the total risk and total hazard over all chemicals is not included. Revise Table 14 to include columns displaying the risk or hazard for each chemical listed in the table. The total risk and total hazard over all chemicals should also be displayed. This information should be furnished for industrial workers and residential receptors.

6. Section 7.3.4, Vapor Intrusion, page 7-3. The last paragraph of Section 7.3.4 states "...a qualitative evaluation for the indoor air exposure pathway is adequate for SS-039. The information above, in addition to the removal of the SWMU 177 soils (the source of TCE impacted groundwater), and documented decrease in TCE concentrations in groundwater... suggests that the vapor intrusion pathway is sufficiently addressed and no further quantitative evaluation of the pathway is warranted." Note that the SS-039 RFI contains no information on the soil removal activities and/or the comparison of confirmatory sampling results to NMED SSLs and the resulting levels of residual soil risk. In addition, decreases in TCE concentrations are not discussed in Sections 7.3.3, Groundwater, or 7.3.4, Vapor Intrusion. Thus, the information contained in Section 7.3.4 does not constitute a qualitative evaluation of the VI pathway. Section 7.3.4 should be revised to include information on the removal of contaminated soil from the site and the impact(s) of the removal on risks and hazards via the VI pathway. Also, Section 7.3.4 should include a discussion on decreases in TCE concentrations (or reference the location of such a discussion within the SS-039 RFI). Additional qualitative lines of evidence such as information on vapor migration and attenuation at the site and the characteristics of Building 1176 that impact vapor intrusion should be added at HAFB's discretion to strengthen the qualitative evaluation. Additional information is available in Section 2.5, Vapor Intrusion Screening Levels, of the NMED RAG, EPA's Subsurface Vapor Intrusion Guidance dated 2002, and Sections 2.0 and 5.0 through 7.0 of EPA's more recent *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* dated 2015.
7. Section 7.4, Ecological Evaluation, page 7-3. Section 7.4 states "No complete exposure pathways for potential ecological receptors exist due to the lack of source of soil contamination at depth intervals considered for evaluation of ecological species (0-10 feet bgs)." The discussion refers to the *Accelerated Corrective Measures Completion Report for SS-039* for information related to the removal of impacted soil at the site. However, Section 7.4 does not provide adequate technical support for the assertion that no complete exposure pathways exist at the site (e.g., source removal was to depth outside of ecological exposure intervals). The text does not identify potential ecological habitats or potential ecological receptors at the site although Section 7.3.3 of the SS-039 RFI indicates that a buffer area was created as part of the Cooperative Agreement for Protection and Maintenance of White Sands Pupfish. In addition, the SS-039 RFI contains no figures that illustrate or delineate areas of the site impacted by the removal of contaminated soil or capable of providing ecological habitat. As previously noted, no details regarding the removal of contaminated soil at the site are contained in the SS-039 RFI; thus, it is not known if an ecological evaluation of the site was performed as part of the soil removal. NMED's *Risk Assessment Guidance for Investigations and Remediation, Volume II Soil Screening Guidance for Ecological Risk*

Assessments dated February 2017 (NMED ECO RAG) outlines the information required in a scoping assessment to determine if a screening level ecological risk assessment should be performed at a site. At a minimum, Section 7.4 should be expanded to include information from the *Accelerated Corrective Measures Completion Report for SS-039* related to potential ecological risk at the site as well as the information required for a scoping assessment presented in Section 2.0, Scoping Assessment, of the NMED ECO RAG. All information collected and analyzed as part of the scoping assessment should be presented in the expanded discussion. In addition, the information should be synthesized into a preliminary conceptual site model for ecological risk and all possible exposure pathways discussed. A line of evidence approach should be applied in developing the rationale/justification for eliminating any pathways from further consideration. Revise Section 7.4 to address these issues.

8. Section 8.0, Conclusions, pages 8-1 through 8-3. The risk-based discussions in subsections 8.3, 8.4, and 8.5 of Section 8.0 will likely require review and revision once the issues raised in these technical comments are addressed by HAFB. Ensure that revision of the SS-039 RFI includes review and revision of the risk-based conclusions presented in subsections 8.3, 8.4, and 8.5 of the text.