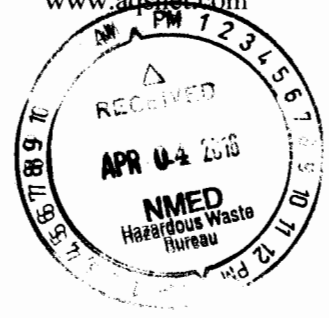




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March 30, 2016

DCN: NMED-2016-07

Mr. David Cobrain
New Mexico Environment Department (NMED)
Hazardous Waste Bureau
2905 Rodeo Park Dr. E/Bldg 1
Santa Fe, NM 87505

RE: Draft Technical Review of the *RCRA Facility Investigation at FL070*, Cannon Air Force Base (CAFB), dated November 2015.

Dear Mr. Cobrain:

Attached please find draft technical review comments on CAFB's, *RCRA Facility Investigation at FL070*, LA-UR-15-28015, dated November 2015.

It appears that this site may have a slug of sinking vapors, as indicated by elevated soil and soil gas data around 50 to 60 feet. Because of the presence of these vapors along with several inconsistencies in the risk assessment, to include exclusion of the vapor intrusion pathway, CAFB has not demonstrated that FL070 meets the criteria for complete with no controls.

If you have any questions, please contact me at (801) 451-2864 or via email at paigewalton@msn.com.

Thank you,

Paige Walton
AQS Senior Scientist and Program Manager

cc: Gabriel Acevedo, NMED (electronic)
Joel Workman, AQS (electronic)

Enclosure

**DRAFT TECHNICAL REVIEW OF THE RCRA FACILITY INVESTIGATION AT
FL070, CANNON AIR FORCE BASE, NEW MEXICO
NOVEMBER 2015**

1. Based on review of the data, it is not clear whether there are sinking vapors or if contamination has migrated vertically and pooled in the 50 to 60 foot range. Discuss the potential for the presence of sinking vapors and future impact on groundwater.
2. Section 3.5. The text states that, “although FL070 is not utilized for residential purposes, the residential screening criteria are more stringent than other criteria (e.g., occupational, construction worker)”. This is not an accurate statement. For constituents where the inhalation pathway drives risk, the screening level for the construction work may be more conservative than that for the residential receptor. For example, manganese has a residential screening level of 1.05E+04 milligrams per kilogram (mg/kg) but the screening level for the construction worker is 4.65E+02 mg/kg. Remove this statement about the stringency of residential levels from the report.
3. Section 3.5. Given that CAFB is a restricted area and that the location of FL070 is an industrial setting, the recreational scenario is incomplete. Further, since there are no unique exposure pathways specific to a recreational receptor at this location, the residential scenario would be protective of a recreational (and trespasser) scenario. Revise the text to include the recreational exposure scenario as incomplete and remove all subsequent calculations from the risk spreadsheets and tables.
4. Section 3.5.1. This section discussed the potential receptors and references a Site Conceptual Exposure Model (SCEM) in Section 5.0 (Figure 5-5). However, the SCEM included in Section 5 is based on the conclusions of the risk assessment. The lack of a pre-risk SCEM makes it difficult to assess whether all potentially complete exposure pathways (and receptors) were addressed in the risk assessment. It is suggested that a complete SCEM (pre-risk) be included in the report. The SCEM should justify what receptors and exposure pathways were evaluated or excluded from the risk assessment.
5. Section 3.5.1. The vapor intrusion pathway is considered potentially complete warranting further evaluation. However, Section 5.4 states that, “Due to the arid environment at Cannon AFB, contamination has primarily been demonstrated to migrate in a vertical direction, rather than horizontal. Based on this contaminant transport model, no soil or soil vapor contamination is anticipated to have migrated beneath Building 326. Due to the location and concentrations of VOCs in soil gas and the soil type found at FL070, vapor intrusion is considered to be an insignificant pathway.” Address the following comments:
 - a. No evidence has been provided to justify the limitation of vapors to vertical migration only. The text refers to a contaminant transport model; however, no modeling is discussed or results provided to support this assumption. Provide actual transport modeling input/output files to support this assumption.

- b. The lateral inclusion zone has not been defined. This include assessing preferential pathways (e.g., underground utility lines and piping) for lateral migration and screening buildings to demonstrate that they are outside of the vapor plume(s). Revise the report to define the lateral zone and provide data to support how this area was determined.
 - c. No documentation or discussion is provided to support why location of volatile organic vapors in an incomplete pathway. Provide additional justification for this statement.
 - d. It does not appear that a complete analysis of soil gas was conducted but rather limited to a specific analytical suite. The soil gas results do not match the results of the soil sampling.
 - e. The NMED Soil Screening Guidance (SSG), Section 2.5.2, allows for a qualitative discussion of the vapor intrusion pathway if all of the following criteria are met: minimally detected compounds, concentrations below screening levels, no source, and concentrations decreasing with depth. While there has been source removal, there is potential evidence of sinking vapors. In reviewing the data provided in the report, many of these conditions have not been met. Data show multiple detections and increasing concentrations with depth, with a high concentration of vapors (and soil detections) around 50-60 feet. Sufficient lines of evidence have not been provided to support exclusion of a quantitative assessment. Revise the risk assessment to include a qualitative assessment of the vapor intrusion pathway.
6. Section 3.5.6. If construction worker screening levels were not available in the NMED SSG, industrial Regional Screening Levels (RSLs) were applied. This may result in an underestimation of risk for those constituents with higher inhalation toxicity. Justification must be provided that the industrial RSL is a conservative estimate for the construction worker. If not, the methodology in the NMED SSG should be used to derive a construction worker screening level.
 7. Table 5-2 and Appendix F, Table F-2. Several discrepancies were noted on Tables 5-2 and Appendix F-2 with respect to screening levels. Revise the tables as follows, and update all risk assessments and soil screening evaluations accordingly.
 - A Soil Screening Level (SSL) is not listed for 1,2,4-trimethylbenzene; however, a SSL is available in the RSLs. The RSLs include a SSL of 2.1E-02 mg/kg based on a dilution attenuation factor (DAF) of 1.0, modified to reflect a DAF of 20 equates to a SSL of 4.2E-01 mg/kg. Modify the table and subsequent evaluations to include this SSL.
 - A SSL is not listed for 1,3,5-trimethylbenzene; however, a SSL is available in the RSLs. The RSLs include a SSL of 1.7E-01 mg/kg based on a DAF of 1.0, modified to reflect a DAF of 20 equates to a SSL of 3.4E+00 mg/kg. Modify the table and subsequent evaluations to include this SSL.

- The residential RSL for soil for 1,3,5-trimethylbenzene is listed as 5.8E+01; the RSL tables list the residential level as 7.8E-02. Revise the table and update all subsequent risk calculations.
- A SSL is not listed for n-butylbenzene; however, a SSL is available in the RSLs. The RSLs include a SSL of 3.2E+00 mg/kg based on a DAF of 1.0, modified to reflect a DAF of 20 equates to a SSL of 6.4E+01 mg/kg. Modify the table and subsequent evaluations to include this SSL.
- A SSL is not listed for 2-methylnaphthalene; however, a SSL is available in the RSLs. The RSLs include a SSL of 1.9E-01 mg/kg based on a DAF of 1.0, modified to reflect a DAF of 20 equates to a SSL of 3.8E+00 mg/kg. Modify the table and subsequent evaluations to include this SSL.
- The residential RSL for soil for 2-methylnaphthalene is listed as 2.3E+02; the RSL tables list the residential level as 2.4E+02. Revise the table and update all subsequent risk calculations.
- No residential soil levels or SSLs are listed for acenaphthylene and benzo(g,h,i)perylene. Surrogate data for acenaphthene and pyrene should be used for these two constituents. Update the table and subsequent risk calculations.
- Data for total xylenes was applied to o-xylene. A residential soil level and SSL is available for o-xylene. Either provide justification for using totals or revise the table and update the risk calculations to include the o-xylene specific data.
- A SSL is not listed for cobalt; however, a SSL is available in the RSLs. The RSLs include a SSL of 2.7E-01 mg/kg based on a DAF of 1.0, modified to reflect a DAF of 20 equates to a SSL of 5.4E+00 mg/kg. Modify the table and subsequent evaluations to include this SSL.
- The residential RSL for soil for cobalt is 2.3E+01. Revise the table and update all subsequent risk calculations as warranted.
- A SSL is not listed for lead; however, a SSL is available in the RSLs. The RSLs include a SSL of 1.4E+01 mg/kg based on a DAF of 1.0, modified to reflect a DAF of 20 equates to a SSL of 2.8E+02 mg/kg. Modify the table and subsequent evaluations to include this SSL.
- Residential screening levels are not included in the table for magnesium, potassium, and sodium. However, in accordance with Section 5.2 of the NMED SSG, essential nutrients may not be excluded from risk assessments and should be compared to the NMED-derived screening levels listed in Table 5-1 of the SSG. Modify the table and subsequent evaluations to include these SSLs.

- The table (F-2) is a little confusing in the post-risk elimination of background, as this approach is inconsistent with the NMED SSG and RCRA. However, no changes are needed.
 - The table (F-2) includes a mix of numbers and scientific notation. Revise the table using one specific format for consistency and clarity.
8. Section 5.2.1. Dichlorofluoromethane was detected in soil but it does not appear to have been detected in soil vapor. What analytes were included in the vapor analyses? Discuss potential data gaps with the soil gas based on other volatile organics detected in soil.
 9. Section 5.2.2.2. For the soil-to-groundwater analyses, it appears that only data from zero to ten feet below ground surface were used in the evaluation. However, this does not take into account contamination at depth that either was not removed during corrective actions or has migrated vertically with time. The data do indicate vertical migration. As such, the soil-to-groundwater assessment must consider all detected results, not just result limited to less than ten feet. It is noted that Section 5.4 identifies naphthalene at 106 feet and dichlorofluoromethane at 110 feet as being below SSLs. The information in Section 5.4 conflicts with the summary provided in Section 5.6, which allows that naphthalene, arsenic, and iron exceeded the SSLs. Clarify Section 5.2.2.2 (and all subsequent sections) to clearly state how the data were evaluated against the SSLs and revise the report for consistency. Revise the soil-to-groundwater assessment accordingly.
 10. Section 5.4. The results in the table presenting the Screening-Level Cumulative Risks and Hazard Indices are inconsistent with the calculations in Table Appendix F-2. Revise the report and calculations for consistency.

