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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 3, 2016

Colonel Douglas W. Gilpin
Commander, 27th Special Operations
Mission Support Group
110 E. Alison Avenue, Suite 1098
Cannon Air Force Base

**RE: DISAPPROVAL
RCRA FACILITY INVESTIGATION AT FL070
CANNON AIR FORCE BASE, NEW MEXICO
EPA ID #NM7572124454
HWB-CAFB-15-006**

Dear Colonel Gilpin:

The New Mexico Environment Department (NMED) has received Cannon Air Force Base's (Permittee) *RCRA Facility Investigation at FL070* (Report), dated November 2015 and received December 7, 2015. NMED has completed review of the Report and issues this Disapproval with the following comments.

Comments:

1. Section 3.5, Human Health Screening- Level Evaluation Methodology

Permittee's Comment: "Although FL070 [Oil Water Separator and Leach Field 326] is not utilized for residential purposes, the residential screening criteria are more stringent than other criteria (e.g., occupational, construction worker)".

NMED Comment: The Permittee's statement is not accurate. For constituents where the inhalation pathway drives risk, the soil screening level for construction worker may be more conservative than that for the residential receptor. For example, manganese has a residential

soil screening level of 1.05E+04 milligrams per kilogram (mg/kg) but the soil screening level for the construction worker is 4.65E+02 mg/kg. Remove the statement that residential screening levels are more stringent than other criteria from the report.

Additionally, given that CAFB is a restricted area and that the location of FL070 is an industrial setting, the recreational scenario is incomplete. 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 exposure scenario. Revise the text to state that the recreational exposure scenario as incomplete and remove all subsequent calculations from the risk spreadsheets and tables.

2. Section 3.5.1, Preliminary Site Conceptual Models

NMED Comment: 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 of the Report 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. Include a complete pre-risk SCEM in the Report. The SCEM should justify what receptors and exposure pathways were evaluated or excluded from the risk assessment.

Also, the vapor intrusion pathway is considered potentially complete warranting further evaluation. However, Section 5.4 of the Report states that, “[d]ue 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 volatile organic compounds (VOCs) in soil gas and the soil type found at FL070, vapor intrusion is considered to be an insignificant pathway.” In order to provide supporting information for this statement the Permittee must 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 includes 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 inclusion zone and provide data to support how this zone was determined.
- c. No documentation or discussion is provided to support why the presence of volatile organic vapors at FL070 is 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 the analysis was limited to a specific analytical suite. The soil gas results do not match the results of the soil sampling. Soil sample analytical results indicated the presence of other VOCs in addition to benzene, toluene, ethylbenzene, and xylene. The Permittee must conduct more comprehensive soil vapor sampling for identified contaminants of potential concern (COPCs) for VOCs and semi-volatile organic compounds which is more aligned with the results of soil sampling. Include the soil gas sampling results in the revised risk screen.

3. Section 3.5.6, Cumulative Human Health Risk Screening

Permittee's Comment: "In the absence of NMED [Soils Screening Levels] (SSLs), [United States Environmental Protection Agency] USEPA [Regional Screening Levels] RSLs (USEPA 2015a) were selected (carcinogenic RSLs were adjusted to a risk of 1E-05, consistent with NMED SSLs). Residential soil RSLs were selected for resident and recreational user scenarios. Industrial soil RSLs were selected for the industrial/occupational worker and construction worker."

NMED Comment: The use of USEPA RSLs may result in an underestimation of risk for those constituents with higher inhalation toxicity for the construction worker exposure scenario. Justification must be provided that the industrial USEPA RSL is a conservative estimate for a construction worker receptor. If not, the methodology in the NMED Risk Assessment Guidance for Site Investigations and Remediation (RA Guidance) dated July 2015 must be used to derive a construction worker screening level.

4. Section 3.5.8, Vapor Intrusion

NMED Comment: Based on review of the soil gas sampling data, VOCs have been detected at depth. Soil and soil vapor sampling chemical analytical results appear to indicate migration of contaminants of concern (COCs) below the 50 foot (ft) to 60 ft below ground surface (bgs) range. In the revised report, discuss the potential for the presence of sinking vapors and future impacts to groundwater.

Additionally, NMED RA Guidance, dated July 2015, Section 2.5.2, Evaluation of the Vapor Intrusion Pathway, allows for a qualitative discussion of the vapor intrusion pathway, if supporting investigation derived evidence indicates volatile and toxic compounds are minimally detected; concentrations are below screening levels; there are no suspected sources for volatile and toxic compounds; and concentrations are decreasing with depth. While there has been source removal, there appears to be evidence of sinking vapors at the site. The Report indicates multiple detections of COCs at increasing concentrations with depth and a concentration of soil vapor and soil COC detections at 50 to 60 feet bgs. Revise the Report to include a qualitative assessment of the soil vapor intrusion pathway, which must include evaluation of the additional COC analysis results. If necessary, a quantitative risk analysis must be conducted.

5. Section 5.2.2.2, Comparison to Risk-based SSL for a DAF of 20

Permittee's Comment: "All VOCs were detected at concentrations below NMED residential SSLs and/or USEPA residential RSLs".

NMED Comment: 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 results 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 Risk-based 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.

6. Section 5.4, Human Health Screening-Level Evaluation

NMED Comment: The results presented in the table in Section 5.4 titled "Oil Water Separator and Leachfield 326 (FL070) Screening-Level Cumulative Risks and Hazard Indices" are inconsistent with the calculations in Appendix F, Risk Assessment Tables, Table F-2. Revise the Report to resolve this discrepancy.

Additionally, residential screening levels were not included in Report tables during screening and risk evaluation for magnesium, potassium, and sodium. However, in accordance with Section 5.2 of the July 2015 NMED RA Guidance, 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 RA Guidance. Modify the Report tables and risk evaluations to include these constituents.

7. Table 2-4, Bioventing Remediation Installation Soil Sampling Results From Monitoring Points MPA, MPB, and MPC

NMED Comment: Table footnote No.1 indicates that the screening level is for Residential Soil-Gas Vapor Intrusion Screening Levels (VISLs). The listed screening levels within the table actually correspond to NMED's residential soil screening levels. The listed screening levels are correct; the footnote is incorrect. The footnote must be revised so that it provides the appropriate reference.

8. Table 4-1, Summary of Soil Vapor Samples For Chemical Analysis

NMED Comment: Section 5.3.1 of the Permittee's approved June 2010, *Work Plan for Final Closure of Solid Waste Management Units -70 and 71 at Cannon Air Force Base, New Mexico*, states that sixteen soil gas samples would be collected which included the samples

collected at designated sample ports and the air injection well. The Permittee must provide a section in the revised Report titled "Deviations from Approved Work Plan" and include an explanation for not collecting a sample from the air injection well.

9. Table 4-2, Summary of Analytical Data Soil Sampling 2015

NMED Comment: Concentrations of the COCs acetone, 2-butanone, bis (2-ethyl hexyl) phthalate, and methylene chloride were not listed in the summary data tables, but were reported in the laboratory analytical data reports. Review and revise, as necessary, all summary data tables for completeness or provide an explanation for not including the detected concentrations in the data tables. The Permittee must ensure that all data presented in the tables is complete and accurate. The risk screen must be revised to include the omitted data.

10. Table 5-1, Summary of Analytical Data Air Sampling January 2015

NMED Comment: The concentrations for benzene in samples CA1-MPA-50, CA1-MPB-5, CA1-MPB-25, CA1-MPC-50, and CA1-MPC-110 were reported as non-detect in Table 5-1; however, the analytical laboratory data includes reported detections for these samples. Similar errors were noted for xylene for samples CA1-MPA-110 and CA1-MPC-110. Review and revise, as necessary, all data tables for completeness or provide an explanation for not including the reported concentrations in the data tables. The Permittee must ensure that all data presented in the tables is complete and accurate upon submittal.

11. Table 5-2 and Appendix F, Table F-2

NMED Comment: Several discrepancies were noted on Table 5-2 and Appendix F, Table F-2 with respect to screening levels. Revise the tables as follows, and update all risk assessment and soil screening evaluations accordingly.

- a. An NMED SSL is not available for 1,2,4-trimethylbenzene; however, a RSL is available. The RSLs include a Risk-based SSL for protection of groundwater of 2.1E-02 mg/kg for 1,2,4-trimethylbenzene based on a dilution attenuation factor (DAF) of 1.0. When the screening level is modified to reflect a DAF of 20, the SSL is 4.2E-01 mg/kg. Modify the table and subsequent evaluations to include this SSL.
- b. An NMED SSL is not available for 1,3,5-trimethylbenzene; however, a RSL is available. The RSLs include a Risk-based SSL for protection of groundwater of 1.7E-01 mg/kg for 1,3,5-trimethylbenzene based on a DAF of 1.0. When the screening level is modified to reflect a DAF of 20, the SSL is 3.4E+00 mg/kg. Modify the table and subsequent evaluations to include this SSL.
- c. The residential SSL listed in the Report for 1,3,5-trimethylbenzene is listed as 5.8E+01 mg/kg; however, the current residential RSL is 7.8E+02 mg/kg. Revise the table and

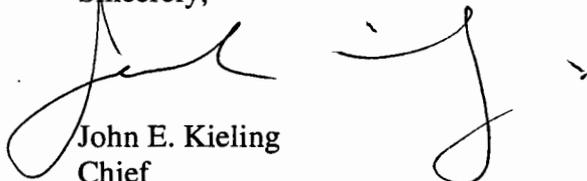
- update all subsequent risk calculations. Add a footnote that indicates the USEPA RSL was utilized as the screening level.
- d. An NMED SSL is not available for n-butylbenzene; however, a RSL is available. The RSLs include a Risk-based SSL for protection of groundwater of 3.2E+00 mg/kg for n-butylbenzene based on a DAF of 1.0. When the screening level is modified to reflect a DAF of 20, the SSL is 6.4E+01 mg/kg. Modify the table and subsequent evaluations to include this SSL.
 - e. An NMED SSL is not available for 2-methylnaphthalene; however, a RSL is available. The RSLs include a Risk-based SSL for the protection of groundwater of 1.9E-01 mg/kg for 2-methylnaphthalene based on a DAF of 1.0. When the screening level is modified to reflect a DAF of 20, the SSL is 3.8E+00 mg/kg. Modify the table and subsequent evaluations to include this SSL.
 - f. The residential RSL for 2-methylnaphthalene is listed as 2.3E+02 mg/kg; however, the current residential RSL is 2.4E+02 mg/kg. Revise the table and update all subsequent risk calculations. Add a footnote that indicates the USEPA RSL was utilized as the screening level.
 - g. No residential screening levels for soil are listed for acenaphthylene and benzo(g,h,i)perylene. Surrogate data for acenaphthene and pyrene must be used for these two constituents. Update the table and subsequent risk calculations. Add a footnote in the Report that indicates that surrogate data was used.
 - h. 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 the totals or revise the table and update the risk calculations to include the o-xylene specific data.
 - i. An NMED SSL is not available for cobalt; however, a RSL is available. The RSLs include a Risk-based SSL for protection of groundwater of 2.7E-01 mg/kg for cobalt based on a DAF of 1.0. When the screening level is modified to reflect a DAF of 20, the SSL is 5.4E+00 mg/kg. Modify the table and subsequent evaluations to include this SSL.
 - j. The residential RSL for cobalt is 2.3E+01 mg/kg. Revise the table and update all subsequent risk calculations as warranted.
 - k. An NMED Risk Based SSL for protection of groundwater is not listed for lead; however, the RSLs list a Maximum Contaminant Level-based SSL for lead for protection of groundwater of 1.4E+01 mg/kg based on a DAF of 1.0. When the screening level is modified to reflect a DAF of 20, the SSL is 2.8E+02 mg/kg. Modify the table and subsequent evaluations to include this SSL.

- l. NMED has noted that the post-risk elimination of background presented in Table F-2 is inconsistent with the NMED RA Guidance and Resource Conservation and Recovery Act (RCRA). However, no changes to the Report are needed at this time.
- m. Inconsistencies in the use of numerical data formatting were noted in Table F-2. Revise the table using one specific numerical format for consistency and clarity.

The Permittee must submit a revised Report to address all of the comments contained in this Disapproval. The revised Report must be accompanied by a response letter that cross-references NMED's numbered comments. The Permittee must also submit an electronic redline-strikeout version of the Report that shows where all changes were made to the Report. The revised Report must be submitted no later than **November 1, 2016**.

If you have any questions regarding this letter, please contact Gabriel Acevedo at (505) 476-6043.

Sincerely,



John E. Kieling
Chief
Hazardous Waste Bureau

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