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KAFB/Red/94*

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MEMORANDUM

TO: Steve Zappe, RCRA Permitting Program

THROUGH: Lee Winn, RCRA Technical Compliance Program Supervisor *LW*

FROM: Ron Kern, Technical Compliance Program *CAK*

DATE: June 3, 1994

SUBJECT: **Response to Questions and Comments by Mr. Mark Silva Related to the Kirtland Air Force Base Sewage Lagoons and Golf Course Main Pond Post-Closure Plan.**

The RCRA Technical Compliance Program was requested by the RCRA Permitting Program to provide responses to public questions and comments, written in a May 18, 1994 letter by Mr. Mike Silva. The questions and comments relate to the Kirtland Air Force Base (KAFB) Post-Closure Plan for the Sewage Lagoons and Golf Course Main Pond, both of which are RCRA-regulated units.

Questions and Comments by Mr. Silva are in bold print within parentheses and are quoted directly from his May 18, 1994 letter. Following the quotes are responses from the Technical Compliance Program of the Hazardous and Radioactive Materials Bureau (HRMB).

**1. Question:** (...how do the values and type of Chromium compare to the levels in the pond and lagoon liquids and sludge? Has the valence been documented? Is it Chromium 3 or Chromium 6?).

**Response:** The Sewage Lagoons (SLs) and Golf Course Main Pond (GCMP) at KAFB are no longer in use, and the liquids have been removed. Sampling and analysis have been conducted previously upon sludges, sediments, and groundwater at the SLs and GCMP. Total chromium (Cr) in dry sludges from the SLs occurs in concentrations up to 2,225 mg/kg; all of the sludge data, however, are suspect because the matrix spike and/or matrix spike duplicate (MS/MSD) data, as part of KAFB's laboratory Quality Control (QC) program, were out of limits. Soils located directly beneath the SLs had total Cr concentrations up to 27.4 mg/kg. Soils, from four (4) borings augered to a depth of one hundred (100) feet at the SLs, tend to have total Cr concentrations which decrease with depth. Total Cr concentrations in some groundwater samples from four (4) monitoring wells at the SLs have previously exceeded the New Mexico Water Quality Control Commission (NMWQCC) Maximum Contaminant Level (MCL) for Cr (0.050 mg/L); Cr VI has been detected in the groundwater at the SLs.

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Total Cr in dry pond sediments at the GCMP occurs in concentrations up to 103 mg/kg; all of these data, however, are suspect because the MS/MSD data were out of limits. Total Cr concentrations in some groundwater samples from four (4) monitoring wells at the GCMP have also previously exceeded the NMWQCC MCL for Cr; Cr VI has been detected in the groundwater at the GCMP.

The valence state(s) of the Cr has not been adequately documented. Cr VI has been detected previously in the groundwater at both the SLs and GCMP. As part of the currently proposed Post-Closure Plan for the SLs and GCMP, KAFB will analyze sludge samples for total Cr, Cr VI, and Toxicity Characteristic Leaching Procedure (TCLP) Cr. Groundwater samples will be analyzed for Total Cr, Cr VI, and turbidity.

**2. Question: (Apparently NMED believes that the source of the Chromium is from the lagoons and pond. Has anyone considered that it may be naturally occurring? or is from some other source?).**

**Response:** HRMB understands that Cr may be related to one or more sources, including naturally occurring minerals, corrosion of stainless steel well or pump components, and/or as contamination from the SLs and GCMP. A background study of Cr in groundwater has not been provided by KAFB to HRMB to address the question of whether the Cr might be naturally occurring. KAFB is currently using Cr-bearing stainless steel well components in their groundwater monitoring wells at the SLs and GCMP; monitoring wells constructed of materials containing no Cr would be required and recommended by HRMB to determine if Cr might be derived from monitoring well components. Unless KAFB can adequately verify the source(s) of Cr in the groundwater at the SLs and GCMP, HRMB must assume that the Cr is contamination from these RCRA-regulated units because that rationale is more protective of human health and the environment.

**3. Question: (Has anyone focused on data trends (increase or decrease over time) of Chromium as related to these sites?).**

**Response:** The groundwater data from both the SLs and GCMP do not show any apparent trend over time. The currently proposed Post-Closure Plan requires a Phase I investigation, which includes quarterly groundwater sampling for one (1) year from all monitoring wells at the SLs and GCMP. All data will be evaluated to determine if there are any exceedances of the NMWQCC MCL for Cr, as well as to ascertain if there are any temporal trends in Cr concentrations.

4. Question: (Wasn't the original closure initiated for organic contamination?).

Response: A review of the available records indicates that an organic contaminant, 1,1,1-trichloroethane (TCA), had been discharged into the SLs during their active life. The GCMP obtained part of its water as wastewater from the SLs and therefore may have received some of the same organic contaminant. Although an organic contaminant was the initial contaminant of concern, the ensuing investigation and evaluation of all the analytical data led HRMB to conclude that Cr is currently the only contaminant of concern.

5. Question: (Has anyone evaluated the drill logs from the perimeter wells at both sites to determine if the vadose zone conditions are sufficient to allow Chromium transport to the water table without first being attenuated by 480 feet of unsaturated zone?).

Response: HRMB is not aware currently whether KAFB has evaluated the vadose zone drilling data to determine if Cr might have migrated to the groundwater from one of the surface impoundments. HRMB, however, which is tasked to protect human health and the environment, must rely upon actual groundwater data, when available, in lieu of hypothetical modeling of contaminant fate and transport in the vadose zone.

6. Question: (Has anyone conceived of the magnitude, feasibility [sic] and cost of cleaning up chromium on a regional ground water scale?).

Response: As addressed previously in the Response to Question 2, KAFB has not provided HRMB with a study of background concentrations of Cr in the uppermost aquifer at the facility. Upon completion of the Phase I annual groundwater monitoring program for the proposed Post-Closure Plan, HRMB, in coordination with KAFB, will evaluate all the newly-acquired data to determine if any corrective action is required at either of the two RCRA-regulated units.

7. Comment: (The type of sampling protocol originally used to support this whole compliance action would not stand up to the industry standard SW 846 quality assurance scrutiny and representative sampling protocol that had to be used throughout the remaining history of these sites.).

Response: HRMB has, and always will promote sampling and analytical techniques which yield defensible data. Additionally, HRMB encourages facility usage of the QC guidance presented within the U.S. Environmental Protection Agency's publication SW-846 (Test Methods for Evaluating Solid Waste). Nevertheless, if inadequate

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sampling protocol was utilized to "support this whole compliance action", there would have been a need for revision of the sampling protocol to attain adequacy. In fact, subsequent groundwater monitoring by KAFB, as required by the regulations of the Resource Conservation and Recovery Act (RCRA) and using an approved sampling protocol, developed reliable data which indicated the potential problem with Cr in the groundwater at the SLs and GCMP.

cc: Barbara Hoditschek, RCRA Permitting Program Manager  
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