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MEMORANDUM

TO: Cornelius Amindyas, RCRA Permitting Program

THROUGH: Steve Alexander, RCRA Technical Compliance Program
Manager *S.A.*

FROM: Ron Kern, Technical Compliance Program *R.K.*

DATE: January 7, 1994

SUBJECT: **Comments on the Sampling and Analysis Plan for the Open Detonation Unit of the RCRA Part B Permit Application for the Explosive Ordnance Disposal Range, Kirtland Air Force Base, Albuquerque**

The Technical Compliance Program was requested by the RCRA Permitting Program to review the Sampling and Analysis Plan (SAP) for the Open Detonation Unit (OD) of the July, 1993 RCRA Part B Permit Application (Revision 4.0) for the Explosive Ordnance Disposal (EOD) Range, Kirtland Air Force Base (KAFB).

The SAP for the OD Unit is listed as Permit Attachment J to the Part B Permit Application. Technical comments related to the SAP are included on the attached pages.

cc: Barbara Hoditschek, RCRA Permitting Program Manager
File: KAFB/Red/94



Technical Comments - KAFB OD Unit - EOD Range

The following technical comments from the RCRA Technical Compliance Program of HRMB relate to the July, 1993 Sampling and Analysis Plan (SAP) for the Open Detonation Unit (OD) of the Explosive Ordnance Disposal Range RCRA Part B Permit Application. Also included are comments on the August, 1993 Section (3.8) related to Risk/Exposure Assessment and general comments on the Part B Permit Application.

Language in bold print enclosed within parentheses is quoted directly from the text of the Part B Permit Application. Following the quotes are comments from the Technical Compliance Program.

ITEM

- 1 Page J1, Sampling Methodology: (**Background levels of all applicable metals will be determined from four separate samples at four separate locations.**). A map should be provided to indicate locations of the proposed background samples. A sufficient number of background samples should be taken from areas that are not near any suspected source of contamination. Samples should be analyzed for all relevant metals which are listed in the Potential Waste Treatment List in Appendix B of the Part B Permit Application (See Item 4).

(**Each background sample will be obtained from 2 feet below the ground surface...**). Background samples should be taken from the same stratigraphic layer(s) as the study area samples, if possible. Background soil samples should be taken from all stratigraphic layers/depths, particularly if a deeper hazardous constituent characterization is required (i.e. borehole samples) during the course of EOD OD operation.

(**All four sample locations will be in areas of undisturbed soils and not less than 75 feet east of the pit (prevailing winds are to the west)**). The wind rose diagrams (Figure 1-4), and discussion of wind patterns within the text of the Part B Permit Application do not indicate a predominant wind direction for the EOD Range. A sufficient number of background sample sites should be selected and sampled outside the affected area of the EOD range (See Item 7).

- 2 Page J2, Sampling Methodology: (**All samples will be obtained using a hollow stem auger**). The procedure and materials used for obtaining background samples should be explained and listed.
- 3 Page J2, Soil Sampling: (**To ensure that contamination has not occurred, soil samples will be collected along eight lines radiating from the firing point.**). The radial sampling line

scheme should be illustrated in a figure. This scheme should probably be constant for all sampling events.

(The length of each radiating line will be determined by the size of shots fired at the site since the last sampling event, the current pit dimensions, prevailing wind direction, and the variable field investigation data.). To ensure that sampling locations are not subject to bias and that they yield effective coverage of the affected area, a randomly-generated statistical sampling design, entailing selection of sampling locations using a probability based scheme, may be most appropriate. Random sampling strategies are discussed briefly in the Chapter on the Sampling Plan in EPA Test Methods for Evaluating Solid Waste; Volume II; Field Manual; SW-846. If this approach is used, it should be described adequately in the Part B Permit Application. A minimum of one (1) sample site per radiating line per sampling event may be appropriate.

(...surface samples will be taken from the bottom of the detonation pit and near the center.). For appropriate characterization, samples should also be collected at a depth of one (1) foot, which is consistent with the approach being proposed for other sampling sites.

- 4 Page J2, Soil Sampling: **(The samples...will be analyzed for Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Thallium and Zinc.)**. With reference to the Potential Waste Treatment List (Appendix B) of the Part B Permit Application, other metals of concern should include Cobalt and Copper . All samples should be analyzed by EPA-approved methods (Laboratory Manual; SW-846), and method quantitation limits should be sufficiently low to detect potentially hazardous concentrations of constituents in the soil matrix.

(All metals and organics shall be sampled for total content.). Organics to be analyzed from all soil samples should be specified. These should include the explosive residue constituents listed on the Potential Waste Treatment List (Appendix B) of the Part B Permit Application. All analytical concentration data between the method detection limit and the method quantitation limit should also be reported.

(All data shall be presented in the final report accompanied by the sample location map of the subject unit.). Environmental sample/analytical data, supporting field and laboratory QA/QC, sample location map, and information on the type and number of explosive events which occurred during the sampling period should be forwarded with a summary cover letter as soon as reasonably possible following each sampling event.

(If the quarterly concentration of the contaminant components in the soil samples exceed background levels at a 0.01 confidence level, four corings will be taken at a depth of 20 feet...in each quadrant...for...metals...). A map should be included with the SAP to indicate where these proposed corings are to be located. Individual soil samples should be collected at five (5) foot intervals by an appropriate and described technique. The depth of the proposed soil corings should be adequate to result in two (2) consecutive vertical intervals in which the concentration for any target analyte metal does not exceed background (at 0.01 confidence level). Additionally, if any soil sample has a constituent which exceeds a facility-generated, screening action level, KAFB should propose what action(s) such exceedance should trigger (e.g. additional investigation; remediation). Furthermore, if any soil sample exhibits a Characteristic, as defined within 40 CFR 261.20 - 261.24, KAFB should propose what action(s) such occurrence should trigger (e.g. additional investigation; remediation).

- 5 Page J3, Sampling Methodology - Monitoring the Open Detonation Trench: (The first two years of semi-annual sampling should be done...). The first two years of soil sampling within the affected area outside the OD Trench area are scheduled currently for quarterly sampling and analysis. To be consistent with this proposed schedule, it is recommended that the OD trench be sampled for the first two years on the same quarterly schedule (See Item 3).

(The Secretary of the New Mexico Environment Department will review the data and address the Permit Modification with regard to the EPA Health Based Action Levels for soil contamination). EPA Health-based Screening Action Levels, as part of the proposed Subpart S Guidance for HSWA Permit Actions (Corrective Action for Solid Waste Management Units at Hazardous Waste Management Facilities; Proposed Rule; EPA; 1990), should be considered only as examples of action levels for cleanup criteria of different media. As such, the example health-based concentration data presented in Subpart S Guidance are based on toxicological data which may no longer be current. KAFB should generate Screening Action Levels for all potential constituents of concern in the soil medium using current Reference Dose (non-carcinogen) and/or Slope Factor (carcinogen) data listed (in order of preference) in IRIS, HEAST, or other acceptable EPA source. The KAFB Screening Action Levels will be evaluated by NMED and compared with KAFB soil constituent concentrations at the time of any proposed Permit Modification.

(Monitor samples should be taken annually from the active portion of the trench wall and bottom using the scoop method described for the semi-annual monitoring period.). HRMB

understands that, after two years of quarterly sampling/analysis, if there has been no statistically significant increase of hazardous constituents in the soils, KAFB is proposing to sample and analyze soil samples on an annual basis. This should be made more clear for both the OD trench area and the affected area outside the OD trench. Additionally, the "scoop method" for sample collection should be described more adequately within the SAP.

- 6 Page J3, (**Open Detonation Mandatory Analyses**). Regardless of analytical methods proposed, method quantitation limits should be sufficiently low to enable detection of potentially hazardous concentrations of constituents within the soil matrix. All analytical concentration data between the method detection limit and the method quantitation limit should also be reported. (Also see Item 4 for metal and organic target analytes).
- 7 Page J5, (**Sample Analysis - Baseline Data**). HRMB understands that the EOD OD is currently in operation and that hazardous constituents may have already been released to the site. Therefore, in addition to and prior to collection of soil background data for metals, a baseline waste characterization of soils covering the entire affected site should be conducted. This characterization of the soils should include the pertinent metals (see Item 4), plus the explosive residue constituents listed on the Potential Waste Treatment List (Appendix B) of the Part B Permit Application, plus gross alpha and gross beta to ensure that radioactive materials have not been included previously with any materials disposed of at the EOD Range.

Collection of these baseline data should be conducted comprehensively according to a systematic design (e.g. grid pattern) or a statistically-based sampling design (See Field Manual; SW-846). Samples should be collected from inside and outside the known or proposed affected area to determine extent and configuration of the currently affected area and to ensure that background samples are collected outside the affected area. The pattern of sample sites should be illustrated in a figure. Samples at each sampling site should be collected at surface and at a depth of one (1) foot with an appropriate sampling technique.

- 8 Page J6, (**Quality Assurance/Quality Control Program (QA/QC)**): The QA/QC Program proposed in the SAP relates only to characterization of the waste to be disposed at the EOD range. Without further knowledge of the QA/QC program referred to in Permit Attachment F (Closure Plan), there does not appear to be adequate coverage of QA/QC concerns related to Sampling and Analysis in the SAP. An adequate Quality Assurance Project Plan (QAPP) for sampling and analysis prior to Closure and for

the Closure Plan should include much of what is presented currently in Section 8 of the Part B Permit Application.

- 9 GENERAL COMMENT: With reference to Section 8 of the Part B Permit Application (Closure Plan Requirements), the following material should be addressed:
- A) Antimony, Copper, and Cobalt should be added to the list of target analyte metals in Table 8-1 (See Item 4). Explosive residues should be added to the list of Analytical Parameters.
 - B) Soil sampling designs and equipment should be characterized more completely with figures (e.g. sample sites) and diagrams (e.g. Veihmeyer Sampler). (See also Items 3 and 4).
 - C) Containment of Investigation-Derived Waste (IDW) (e.g. water and soil from cleaning of Veihmeyer Sampler) should be addressed more completely.
 - D) Section 8.2.2., in which appropriate sample containers and preservatives are discussed should refer to Table 8-2 which lists Sample Containers, Preservation, and Holding Times.
 - E) Table 8-3, listing Target Detection Limits, Analytical Methods, and Instrumentation for Metals Analysis should include Antimony, Copper, Cobalt, and Zinc.
 - F) Table 8-5, listing a Summary of Field Quality Control Samples should also include Explosive Residues as an applicable analysis for all QC sample types and metals as an applicable analysis for Field Duplicates.
- 10 GENERAL COMMENT: In order to adequately characterize the site-specific geology, boreholes with lithologic logs should be completed to sufficient depths throughout the EOD Range site. Soil intervals from these boreholes could be sampled as part of the initial site waste characterization plan (See Item 7).
- 11 GENERAL COMMENT: Depth to the uppermost aquifer and any potentially connected aquifers (i.e perched and/or regional aquifers), including data support, should be addressed more completely within the Part B Permit Application.
- 12 GENERAL COMMENT: All soil boreholes should be backfilled to surface after completion with an expanding cement grout. If KAFB proposes an alternative approach, this approach should be explained in detail and is subject to HRMB approval.

- 13 GENERAL COMMENT: Solid Waste Management Units (SWMU), discussed in Section 9 of the Part B Permit Application, should be illustrated on a figure in relation to the EOD Range. Specifics of each SWMU should be discussed, including potential or known contaminants of concern, to determine the basic impact of the SWMUs (investigation and occurrence) upon the RCRA EOD OD unit.

- 14 GENERAL COMMENT: At time of Closure, a Risk Characterization may be necessary to determine whether levels of hazardous constituents in the soils are actionable. The Risk/Exposure Assessment presented in Section 3.8 does not characterize the risk associated with single or multiple hazardous constituents. To determine what levels of hazardous constituents (action levels) require remediation within the soil at Closure, KAFB should calculate the Risk (carcinogen) and/or Hazardous Quotient (non-carcinogen) associated with each contaminant of concern in the soil. These calculations should be conducted using the most recent toxicity assessment data (from IRIS, HEAST, or other appropriate EPA source) and with consideration for land use (current and future), receptor, and pathway. Risk and Hazard Quotient values for the individual constituents should be considered additive to determine total Risk and/or Hazard Index.

- 15 GENERAL COMMENT: As provided for in 40 CFR 270.23(c), KAFB should ensure that the Part B Permit Application contains sufficient information on the potential pathways of exposure of humans or environmental receptors to hazardous waste or hazardous constituents and on the potential magnitude and nature of such exposures.