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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 Risk Assessment Review Comments on the Petition for No Further Action for Landfill No. 3 (SWMU 105), Landfill No. 4 (SWMU 104), and Landfill No. 25 (SWMU 97) at Cannon Air Force Base, New Mexico, May 2006

Dear Mr. Cobrain:

This letter addresses the technical review on the risk assessments associated with Cannon Air Force Base's (CAFB) "Petition for No Further Action for Landfill No. 3 (SWMU 105), Landfill No. 4 (SWMU 104), and Landfill No. 25 (SWMU 97)" dated May 2006. As we have discussed, parts of this report and the associated risk assessments are quite dated (ranging from 1991 to 2006). As such, the risk assessments were evaluated based upon what was available at the time of the drafting of the report as well as evaluated against present day practice. It is also noted that documentation is provided in the report (Appendix C) of approval of the previously submitted facility investigation reports including the risk assessments. The approval letters do allow for requirements of additional investigation as well as for groundwater monitoring. As this review focused on previously approved risk assessments, review comments are organized in a more generalized fashion, rather than specific comments.

The primary concern with the report as a whole is that sufficient data do not appear to have been collected to adequately characterize the nature and extent of residual contamination and subsequently risks with respect to dioxins and furans. All three of the landfill Solid Waste Management Units (SWMUs) were historically used for burning of various wastes, to include fuels, spent fuels, oils, and other organics. The burning of chlorinated compounds results in the formulation and release of dioxin/furan congers. In reviewing the data associated with each of these units, these compounds are not listed as being included for analysis. Dioxins/furans are known carcinogens and often drive risks when present. Without a complete understanding of potential contaminants of concern, and specifically dioxins/furans, a determination as to whether no further action is justified can not be made. As noted in the attached comments, additional investigations to determine the presence and magnitude of dioxin/furan contamination appears warranted. Please note that analytical data should be provided for all congeners and a toxicity equivalency concentration (or TEQ) should be determined.

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Underlying these SWMUs is the Ogallala Formation, which is a primary potable aquifer for CAFB and the vicinity. While groundwater monitoring has occurred over the past ten years, detected concentrations have only been compared to New Mexico water quality criteria and Federal Maximum Contaminant Levels (MCLs). Typically, comparison of groundwater data to tap water screening levels would be conducted; however, the risk assessments included ingestion of groundwater as a complete pathway, and thus, risk of ingestion of potentially contaminated groundwater was assessed.

In each of the risk assessments, a comparison of metals to background was conducted. The procedure does not follow current protocol, however, the methodology applied is not too dissimilar. Site average and maximum detected concentrations were compared to a background upper tolerance limit (UTL). If the site concentrations were above the UTL, a statistical comparison of the data was conducted. For organics, several constituents were eliminated based upon frequency of detection (less than five percent). As these are landfills with varied histories, exclusion of constituents from risk analysis based on detection frequency should not have been approved. Several of the constituents dropped from the assessment include polynuclear aromatic hydrocarbons (PAHs), which often drive risk. Also, as PAHs would be expected based on the waste histories, these chemicals should have been carried forward into the risk assessment.

The risk assessments considered volatilization of organics detected in soil into air. This process is not the same as current methodologies for assessing exposure via the vapor intrusion pathway. It does not appear that inhalation of vapors built up in a structure through migration was evaluated. Today, the Johnson and Ettinger model would be applied for predicting indoor air concentrations.

Average soil concentrations were applied as the exposure point concentrations (EPC). Today, either the maximum detected concentration or the 95-percent upper confidence level (UCL) of the mean is applied as the EPC. The average measured soil concentrations from soil borings (assumed average over a range of depths) for each site were below the July 2009 NMED residential soil screening levels (SSLs) and hydrocarbon limits (from the NMED Total Petroleum Hydrocarbon screening guidance).

Overall there are some differences between how the risks at these sites were evaluated compared to current practices. However, site-specific risk assessments, to include ingestion of groundwater and ingestion of food/homegrown produce, were evaluated. While not as conservative as comparing to a current SSL, the site-specific assessments are inclusive of all complete exposure pathways, and are thus more refined.

While no major issues are noted with the risks, there is still uncertainty as to whether the sites have been adequately characterized with respect to dioxin/furan/PCB congeners. It is recommended that additional characterization and subsequent updates to the risk assessments for these constituents be addressed.

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

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Thank you,

Paige Walton
AQS Senior Scientist and Project Lead

Enclosure

cc: Patricia Stewart, NMED (electronic)
Joel Workman, AQS (electronic)

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