



BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us



RON CURRY
Secretary

SARAH COTTRELL
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

December 6, 2010

Colonel Robert L. Maness
Base Commander
377 ABW/CC
2000 Wyoming Blvd. SE
Kirtland AFB, NM 87117-5606

Mr. John Pike
Director, Environmental Management Section
377 MSG/CEANR
2050 Wyoming Blvd., Suite 116
Kirtland AFB, NM 87117-5270

**RE: GROUNDWATER TRAVEL TIME
BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, EPA ID# NM9570024423
HWB-KAFB-10-031**

Dear Col. Maness and Mr. Pike:

The New Mexico Environment Department (NMED) has reviewed the undated report *Groundwater Travel Time from Bulk Fuels Facility, Kirtland Air Force Base, KAFB, New Mexico*, received September 7, 2010 (hereinafter referred to as the Report). The Report was required under the NMED's letter of August 6, 2010, concerning groundwater contamination caused by the Bulk Fuels Facility Spill (Solid Waste Management Units ST-106 and SS-111).

Hydraulic Gradient

Although the value for hydraulic gradient used to generate the estimates of average linear velocity and travel time should be based principally on water-levels from areas between the production wells and the leading edge of the 1,2-dibromoethane (EDB) plume, there are no reliable data for that area. Figure 3, *Intermediate Scale Water Table Map: October 2009*, shows no data beyond the leading edge of the plume to or at the Ridgecrest well field, and Figure 4, *Intermediate Scale Water Table Map: January 2010* uses a water level for Ridgecrest Well #4 that is almost four years old. Furthermore, water levels for wells Ridgecrest #3 and Ridgecrest #4 appear to be derived from estimated ground-surface elevations, not actual surveyed reference

KAFB3506



points. It is unclear if natural static levels were reached before water level measurements were taken. This makes the maps and therefore conclusions drawn from them unreliable.

Conductivity

The value for saturated hydraulic conductivity was taken from the literature, and is not based on site-specific measurements. In the *Groundwater Advective Transport Velocity* section of the Report, a saturated hydraulic conductivity of 60 ft/day was chosen to reflect a worse-case scenario. However, *Appendix A* of the *Source Water Assessment, Albuquerque Water Supply System, Public Water System No. 107-01* (New Mexico Environment Department, Drinking Water Bureau, March 2002) lists the saturated hydraulic conductivity for the aquifer at production well Ridgecrest #5 as 80 ft/day, a value over 30 percent higher than used in the Report.

Porosity

The average porosity value used in the Report was taken as 10 percent to be conservative. However, actual porosity values are probably in the range of at least 20-30 percent based on the type of geologic units that are expected to be present in the area.

The Report states that a flow path does not exist for the VA Hospital well, which is the closest production well to the source area of fuel contamination. However, no definitive evidence (such as monthly or seasonal water level maps) was included in the Report to support such a statement. Figure 6 of KAFB's presentation to the Siesta Hills Neighborhood Association, May 2010, shows a bulge in the dissolved oxygen content in groundwater just south of the VA Hospital well. There may indeed be seasonal effects on the geometry of the contaminant plume caused by pumping of the VA Hospital well. If the geometry of the plume is affected by pumping of the well, then a flow path to the VA Hospital well must exist (on at least a seasonal basis). Similarly, there was insufficient evidence included in the Report to support the position that no flow paths exist for production wells KAFB-15 and KAFB-16.

Velocity

Finally, the estimates of average linear velocity and travel time are based on the completely unsupported assumption that groundwater flow in the vertical dimension can be ignored. There simply are no wells screened below the water table at appropriate depths. Therefore, no information exists to support such an assumption.

Reliable estimates of average linear velocity and travel time are needed to answer the basic question of how long will it take for dissolved-phase contaminants to reach the production wells. However, the site-specific data required to produce such estimates are clearly unavailable at this time, and underscores the necessity and urgency to complete the investigation work that has been directed under NMED's letters of April 2, 2010, and August 6, 2010. NMED expects the estimates of average linear velocity and travel time to be updated at the conclusion of the

groundwater investigation using site-specific data and that these estimates will be provided to the NMED in the Investigation Report.

If you have any questions regarding this matter, please contact Mr. William Moats of my staff at (505) 222-9551.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Kieling, NMED HWB
W. Moats, NMED, HWB
W. McDonald, NMED, HWB
S. Brandwein, NMED, HWB
B. Olson, NMED GWQB
L. King, EPA-Region 6 (6PD-N)
File: Reading and KAFB 2010