



MEMORANDUM

DATE: February 14, 1984

TO: David Boyer, WRS III, GWS

FROM: Kevin Lambert, WRS II, GWS *KAL*

SUBJECT: Movement of contaminant (PCE) in the unsaturated zone at PNM-Person Generating Station, Albuquerque, NM

From my analysis of the data provided December 29, 1983 (namely Tables 4-1 and 4-2, Figures 4-2 to 4-4) from the Person Generating Station, the conservative tracer contaminant (PCE) is not presently moving at a measurable rate in the unsaturated zone. This lack of movement is in response to the low moisture content exhibited in the area. However, if in the future the moisture content increases (consequently the driving force increases) the movement of contaminant may reach the water bearing formation below. Therefore, I recommend a monitoring program that would allow for in situ measurement of the moisture content above the water table so that if any increase arises precautionary steps can be taken to inhibit movement to the water table.

A neutron moisture logging system would allow rapid, successive readings in the same profile at the same field location. This would provide the necessary data to make decisions concerning the movement of contaminants. However, one disadvantage to this technique that must be kept in mind is that the fast neutrons can be moderated by other constituents besides hydrogen in water (e.g., chlorine or boron).

In addition, I found in reading through the Summary of Phase I Investigations that additional information is required to clarify the analysis prepared by Geoscience Consultants. Namely:

1. Clarification between the final sentences in Section 3.2 and Section 4.4 regarding lab K_u and its relationship with actual field conditions.
2. Clarification as to the actual porosity and sedimentary material represented. The report states porosity to be 22-27% where figures 4-2 to 4-4 show porosity to be 31-40%. According to current literature a porosity of 20-35% is representative of a gravel-sand mixture and a porosity of 35-40% is a medium to coarse grained sand mixture (Chow, 1964; Todd, 1980).

The difference in porosity will not affect the unsaturated K and saturated K but this difference will affect the rate at which these values are approached because of the difference in moisture content. For example, a background moisture of 10% and total porosity of 27% means that it takes less moisture and time to approach saturated K . With a greater porosity (say 40%) additional moisture and time is necessary to approach saturated K , all other things remaining constant.

KL:egr