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STATE OF NEW MEXICO

ENVIRONMENTAL EVALUATION GROUP

P.O. BOX 3149
CARLSBAD, NEW MEXICO 88220
(505) 885-9675

March 30, 1988

Mr. Robert E. Browning
Director, Division of Waste Management
U. S. Nuclear Regulatory Commission
Mail Stop 623-SS
Washington, DC 20555

Dear Mr. Browning:

Enclosed are the two most recent reports issued by EEG. "A Critical Assessment of Continuous Air Monitoring System at the Waste Isolation Pilot Plant" by John C. Rodgers and Jim W. Kenney, EEG-38, and "Chemical and Radiochemical Characteristics of Groundwater in the Culebra Dolomite, Southeastern New Mexico" by Jenny B. Chapman, EEG-39.

EEG-38 is a detailed study of a critical component of the WIPP occupational health protection and stack monitoring programs. The report focuses on several likely deficiencies in the design of the alpha (L x-ray) and beta continuous air monitors (CAMs) that have been installed at WIPP, and reaches the conclusion that the present designs apparently fail to meet mandatory performance requirements for such instruments prescribed by DOE Orders.

Specific topics covered include instrument calibration, background interference correction, detector response, and particulate losses in the CAM head. Much of the analysis is based on physical models of the fundamental processes involved. In addition, the findings of a number of important experiments are reported, which validate and substantiate many of the conclusions.

Rodgers and Kenney recommend that a program of detailed performance testing of the existing CAMs be started at once to confirm (or reject) the principal findings of this report. In the meantime, it is strongly recommended that a vigorous search be initiated to find alternative CAM systems and detection schemes.

EEG-39 presents the interpretation of chemical data from groundwater samples collected from the principal water-bearing unit in the WIPP area. The EEG groundwater sampling program has three objectives: 1) major ion analyses help determine groundwater flow paths and reactions that occur along the flow paths, 2) radiochemical data establish a baseline of existing radionuclides in area groundwater prior to the arrival of waste at WIPP, and 3) stable and radioactive constituents help predict the behavior of the Culebra as a radionuclide transport pathway. These topics are discussed in detail in the report and all of the data are presented in the appendix.

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Providing an independent analysis for the New Mexico Health and Environment Department of the Waste Isolation Pilot Plant (WIPP), a federal nuclear waste repository.

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Ms. Chapman concludes that major influx of freshwater recharge to the Culebra occurs south of the WIPP Site. There is also chemical evidence that the Culebra contains discrete flow paths (fractures or karst) interspersed with areas of slower water movement. Water chemistry variations correlate well with the amount of evaporite dissolution in the Rustler Formation. The concentrations of naturally occurring radionuclides indicate that some nuclides (Ra, U, and Th) are relatively soluble in the high-chloride, oxidizing Culebra environment. However, water in the southern, low-chloride area appears less favorable for transport of radium isotopes.

Recommendations include continued radionuclide analyses to improve the statistical data base and exploration of naturally occurring waste analogs. Additional sampling for major ion chemistry is needed in the southern area of suspected recharge and near well H-5 where conflicting interpretations suggest both very old and very young water.

Sincerely,



Robert H. Neill
Director

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