

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
KERR-MCGEE CHEMICAL CORPORATION	)	Docket No. 40-2061-ML
(West Chicago Rare Earths Facility)	)	ASLBP No. 83-495-01-ML

TESTIMONY OF CHARLEY YU ON CONTENTION 3(g)(2)

Q.1. Dr. Yu, what is the purpose of this testimony?

A.1. The purpose of this testimony is to provide some information concerning benchmarking the modified solute transport code used in SFES.

Q.2. Was the modified solute transport code used in the SFES benchmarked?

A.2. No, the modified solute transport code - MAT123D - was not benchmarked because benchmarking the code is not necessary. The reason is as follows: the exercise of benchmarking consists of solving the same set of problems with several different computer codes and comparing the results (Narasimham 1987, Some Thoughts on Model Verification, in: Flow and Transport Unsaturated Fractured Rock, ed. by D.D. Evans and T.J. Nicholson, p. 185). The MAT123D was used in the SFES to calculate and compare solute concentrations for the Proposed Action and all alternatives. Because MAT123D is the only computer code used, no benchmarking is needed.

Q.3. Was MAT123D validated?

A.3. Validation of a computer code consists of testing the model predictions against physical experiments. I am not aware of any physical experiments conducted to validate MAT123D. However, the methodology used in the code was referenced and described in detail in the SFES. Furthermore, the travel-time method used in MAT123D is a referenceable method (Gilbert et al., 1983. ORO-832 [Rev.]) and this method has been used by DOE in preparing environmental impact statements (DOE/EIS-0109F).

CHARLEY YU

PROFESSIONAL QUALIFICATIONS

I am employed in the Radiological Sciences Section, Environmental Assessment and Information Sciences Division, Argonne National Laboratory (ANL). My position is Environmental Systems Engineer/Radiological Analyst. I have worked at ANL since June 1984. My primary responsibilities are performing environmental impact analysis, conducting radiation dose calculations, developing pathway analysis computer codes, and modeling solute transport in groundwater systems. Specific experience has included developing the DOE pathway analysis computer code, RESRAD; conducting modeling studies of radioactive and chemical waste transport in the environment; conducting pathway analyses to determine residual radioactive material cleanup criteria in soil; conducting radiation dose calculations and risk evaluations for assessment of impacts resulting from the transportation and disposal of wastes; conducting a study on the disposal of mixed wastes and compiling a carcinogenic risk factors database; conducting a study a dose limits, health risks, and cost benefit considerations for remedial actions; contributing to the preparation of a handbook, Greater-Confinement Disposal of Low-Level wastes; and contributing to the review of proposed high-level waste repository site characterization plans and environmental field activity plans.

From September 1980 to June 1984, I was a Graduate Research Assistant at Pennsylvania State University, where I conducted research in

various aspects of waste management. Specific accomplishments have included developing a general nuclide transport model, GTC, to predict waste in geologic media under saturated/unsaturated and homogeneous/fractured conditions; developing hydrogeologic transport parameters for a waste repository; testing tracer movement in laboratory soil columns under saturated and unsaturated flow conditions in homogeneous and inhomogeneous media, and contributing to the Pennsylvania Low-Level Waste Disposal Siting Project.

I have published over 25 papers and articles in the area of solute transport modeling, hydrogeologic transport parameter identification, pathways analysis, and radioactive waste management. I received a Bachelor of Science degree in Nuclear Engineering in 1976 and a Master of Science degree in Health Physics in 1978 from the National Tsing-Hua University, Taiwan, and a Ph.D. degree in Nuclear Engineering in 1984 from Pennsylvania State University, State College, Pennsylvania. I am a member of American Nuclear Society and Health Physics Society.