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CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES QUALITY ASSURANCE SURVEILLANCE REPORT

PROJECT NO: 20-5708-661

REPORT NO: 97-08

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SURVEILLANCE SCOPE: Thermal Effects on Flow KTI Activities

REFERENCE DOCUMENTS: HLW Operations Plans, Current PMPR

STARTING DATE: 5/20/97

ENDING DATE: 5/21/97

QA REPRESENTATIVE: R. D. Brient *lsb*

PERSONS CONDUCTING TEST/EXAM/ACTIVITY: A. Chowdhury, R. Green, R. Chen, M. Ahola, G. Ofoegbu, G. Rice (Consultant), F. Dodge (04)

SATISFACTORY FINDINGS:

Perched water formation: Analyses have been conducted to predict the evolution of perched water considering the presence of a repository. The analyses were conducted in the early part of the fiscal year using the beta version of Metra (a module of MULTIFLO), issued in June, 1996. Later beta versions were issued, but evaluations showed no impact on the results, so the runs were not repeated. Current activity involves reviewing and interpreting the data for preparation of a journal article (Intermediate Milestone 5708-661-760) due in August, 1997. Scientific Notebook #184 includes initial and in-process entries describing these analyses. The notebook appears to contain descriptions sufficiently detailed to repeat the analyses.

Sensitivity-to dose analysis: Scientific Notebooks #150, #216, and #204 were reviewed, which described the identification of key parameters affecting the thermal-hydrologic regime in the vicinity of the drift so that analysis runs could be reduced to a reasonable length of time (less than one day). The MULTIFLO code, Metra module (beta version), was used for the preliminary calculations. Since the April, 1997 release of MULTIFLO version 1.0, analyses have used that controlled version of the code. Recent work has involved attempts to connect MULTIFLO (output) to the TPA (input) code. The sensitivity-to-dose calculations are just being started. The Scientific Notebooks both contained initial and in-process entries, and the logical flow of the activity was easily followed.

Water refluxing: Current activity includes development of a code module (reflux5) for use in the TPA code. Scientific Notebook #150 adequately documents this development.

Laboratory determination of thermal conductivity: Tuff samples were used in an experimental apparatus to determine its thermal conductivity. The experiments and results are documented in Scientific Notebook #173, continued in #212, and data analysis and reduction are documented in notebook #209. Initial and in-process entries are appropriate, and notebook #209 was verified as including QAP-014 verification calculations for the conductivity coefficient.

Analytical model to describe heat conduction, etc: Early conceptualization of the model is ongoing. Preliminary work is being compiled for documentation in a Scientific Notebook.

All Scientific Notebooks reviewed appeared to contain the required information in sufficient detail.

Personnel qualifications and QA indoctrination were verified for A. Chowdhury, R. Green, R. Chen, M. Ahola, G. Ofoegbu, G. Rice (Consultant), and F. Dodge (04).

UNSATISFACTORY FINDINGS: none

NONCONFORMANCE REPORT NO: none

ATTACHMENTS:

RECOMMENDATIONS/ACTIONS: Several staff members were not aware that they were using the release version 1.0 of MULTIFLO. Software Release Notices should be more widely distributed (i.e., the list of users expanded) so that all affected staff are aware of the available version.

APPROVED: *[Signature]*

CENTER DIRECTOR OF QUALITY ASSURANCE

DATE: 5/21/97

DISTRIBUTION:

ORIGINAL - CENTER QA DIRECTOR QA Records

ORIGINATOR

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