HLWYM HEmails

From: Keith Compton
Sent: Monday, May 22, 2006 7:47 AM
To: Alexander Sun; Allen Fetter; Christopher Grossman; Jin-Ping Gwo; Randall Fedors; Eugene Peters
Cc: Jude Mcmurry; Paul Bertetti; Andy Campbell; Marissa Bailey; Jack Guttmann; Bret Leslie; James Rubenstone; Timothy McCartin
Subject: SZ1 TSPA barrier analysis session summary

Attached please find a bulleted summary of the SZ1 barrier session that we held on Wednesday May 10. I tried to capture the key questions/issues in the fourth item, based on the discussions and on a review of the IIRSR, but please take a look and see if I got it right. If anyone has any questions of comments please let me know...

1) Scope of SZ1
The following TSPA components are likely to be within the purview of SZ1:
Geologic Framework Model (in conjunction with the General Information Review Team) SZ Hydrogeologic Framework Model Regional Flow Model Site Scale SZ Flow Model (FEHM) Site Scale SZ Flow Properties (PEST) Connectivity of SZ1 components with other elements:
Inputs: Average volumetric recharge from UZ flow model (UZ2)
Outputs: Flow fields for SZ transport model (SZ2); Hydraulic Properties for GoldSim 1D transport model; elevation of water table under different climate states (UZ3)

2) Barrier Identification
DOE Barriers likely to be relevent to SZ1(adapted from EBS RTA, Table 6.7-1)
Barrier: Saturated zone volcanic tuff and alluvial deposits below the water table from the repository to a point of compliance approximately 18 km south Barrier Capability:
- Delay radionuclide movement to the receptor location and reduce radionuclide concentrations by water residence time
- Delay radionuclide movement to the receptor location and reduce radionuclide concentrations by dispersion
NRC Risk Insights for SZ1 Saturated alluvium transport distance (Medium)

3) Information to support an understanding of barrier performance General Information Recall that the EBS transport abstraction has one source term domain and three transport domains: waste form, corrosion product, and invert. The radionuclide mass can be in the following locations:
EBS GoldSim Model: Source Term Domain, Waste Form Domain, Corrosion Product Domain, Invert Domain
Geosphere: Unsaturated Zone, Saturated Zone, Biosphere Each of these locations is potentially associated with a barrier. A mass balance that accounted for all of these locations would yield information on where activity was retained within the system. Identifying where the mass is located in the system may provide an indication of the effectiveness of the associated barrier. Mass balances and mass fluxes are saved in the TSPA results section, and these mass balances may therefore provide an indication of the effectiveness of the different barriers for different nuclides.
Specific information
1) Breakthrough curves for non-decaying, non-sorbing species: Provides an indication of groundwater travel time and dispersion; quantifies the contribution made simply by the groundwater travel time including matrix diffusion but independent of sorption. In comparison with sorbing species, allows an evaluation of the relative contribution of sorption.

4) Key Questions/Issues for SZ1
1) Uncertainties in SZ hydrogeologic framework model
2) Uncertainties in distance to contact between tuff and alluvium
3) Potential impact of flow across faults (faults as flow barrier vs flow channel?)
4) Hydraulic heterogeneity in the alluvium (potential for fast pathways)
5) Implementation of boundary conditions and model calibration

6) Upscaling of laboratory measurements of hydraulic properties to model scale

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