II-I-27

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

ENTERED

OFFICE OF
AIR AND RADIATION

APR 25 1997

George Dials, Manager
Carlsbad Area Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Dear Mr. Dials:

This letter is a follow-up to the letter I sent to Alvin Alm, Assistant Secretary for Environmental Management, on March 19, 1997, regarding the U.S. Environmental Protection Agency's (EPA) review of the U.S. Department of Energy's (DOE) Compliance Certification Application for the Waste Isolation Pilot Plant (WIPP). In that letter, EPA identified lists of performance assessment (PA) input parameters for which EPA had questions about the value(s) selected.

In Enclosure 2, to the March 19, 1997 letter, EPA identified a list of performance assessment input parameters for which my staff had been unable to find supporting data. At that time, 13 key input parameters were either not supported by experimental or field data, or the data trail was untraceable. DOE and Sandia National Laboratory staff have since been able to identify data that were used as the bases for the values chosen for nine of the 13 parameters on the list. In addition, three parameters on the list were subsequently determined by my staff to be "non-sensitive" parameters (i.e., sensitivity analyses results indicate that the parameters do not have a significant impact on the results of the performance assessment). The one parameter remaining (#2, ID# 3246, Material BLOWOUT, Parameter PARTDIA, waste particle diameter in Cuttings Model for direct brine release) is considered "sensitive," but the value for that parameter is not supported by data. Therefore, the parameter value must be derived through "expert judgement" in accordance with EPA's WIPP Compliance Criteria at 40 C.F.R. §194.26 (expert judgment) and 40 C.F.R. §194.22(a)(2)(v) (quality assurance procedures for the implementation of expert judgment elicitation). The provisions of these regulatory requirements, including the requirements for documentation and public

970419

participation, must be satisfactorily applied to the parameter value.

My staff has continued to review parameter values and conduct sensitivity analyses to determine the impact of other relevant parameters on the overall performance of the disposal system. On April 17, 1997, I transmitted a letter to you that included a list of parameters that are no longer in question, and a list of revised parameters values to use in running the BRAGFLO computer code. As I mentioned in my letter, the BRAGFLO parameter values were provided to DOE first because BRAGFLO is the first code to be activated in running the overall performance assessment (PA).

My staff has now completed the review of the remaining parameters identified in my March 19, 1997 letter. Enclosed are two tables: the first table includes parameters that are no longer in question; the second table includes important parameters and associated input values that EPA requires to be used in DOE's PA verification test.

Should you have questions, please call Frank Marcinowski at (202) 233-9310.

Sincerely,

Laurence [signature] for
E. Ramona Trovato, Director
Office of Radiation and Indoor Air

Enclosures (2)

cc: Mary D. Nichols (EPA)
Alvin Alm (DOE/HQ)

Enclosure 1. Parameters identified in the March 19, 1997 letter, which have subsequently been determined by EPA, based on information provided by DOE and Sandia staff or through sensitivity analyses, to no longer be in question.

ID #	Material ID	Parameter ID	Description
64	CASTILER	POROSITY	Effective Porosity
66	CASTILER	PRESSURE	Brine Far-field Pore Pressure
651	WAS_AREA	ABSROUGH	Absolute Roughness of Material
653	WAS_AREA	COMP_RCK	Bulk Compressibility
3429	PHUMOX3	PHUMOX	Proportionality Constant Humic Colloids
3471	BLOWOUT	MAXFLOW	Maximum Blowout Flow
3472	BLOWOUT	MINFLOW	Minimum Blowout Flow
2177	S_MB_139	DPHIMAX	Incremental increase in porosity relative to intact conditions in the Salado Marker Bed 139
2180	S_MB_139	PF_DELTA	Incremental pressure for full fracture development
586	S_MB_139	PI_DELTA	Fracture initiation pressure increment
2178	S_MB_139	KMAXLOG	Log of max permeability in altered anhydrite flow model
3134	BH_OPEN	PRMX_LOG	Log of intrinsic permeability x - direction borehole unrestricted
2158	S_ANH_AB	DPHIMAX	Incremental increase in porosity relative to intact conditions in the Salado anhydrite beds A and B
214	EXP_AREA	PRMX_LOG	Log of intrinsic permeability, X-direction, experimental area
3473	BLOWOUT	THICK_CAS	Thickness of the Castile formation, direct brine releases
3456	BLOWOUT	RE_CAST	External drainage radius for the Castile formation, direct brine releases
3194	CASTILER	GRIDFLOW	Index for selecting brine pockets
3433	PHUMOX3	PHUMSIM	Proportionality constant of actinides in Salado Brine with humic colloids, inorganic
3470	BLOWOUT	GAS_MIN	Gas Rate Cutoff
3317	PU	PROPMIC	Microbial Proportionality Constant
3311	AM	PROPMIC	Microbial Proportionality Constant
2918	CASTILER	VOLUME	Total Reservoir Volume

Enclosure 2. WIPP Performance Assessment Parameters Identified in the March 19, 1997 Letter Which Have Been Determined To Not Be Representative of the Data. DOE Must Use the Parameter Values Identified Below in the Performance Assessment Verification Test.

ID #	Material ID	Parameter ID	Description	Parameterization to be Used in Verification Test			
				Dist Type	**Min**	**Median**	**Max**
3493	GLOBAL	PBRINE	Probability of Encountering Pressurized Brine	Uniform	1%	30%	60%
2254	BOREHOLE	TAUFAIL	Waste Shear Strength	Dependent on Results of Particle Size Distribution Expert Elicitation.[1]			
27	BOREHOLE	DOMEGA	Drill String Angular Velocity	Cumulative	4.2 rads/s	7.7 rads/s	23 rads/s
3245	BLOWOUT	CEMENT	Waste Cementation Strength	Log-uniform	TAUFAIL min[2]	---[3]	4.8E+06 Pa
~~3256[4]~~	~~BLOWOUT~~	~~FGE~~	~~Gravity Effectiveness Factor~~	~~Uniform~~	~~1~~	~~9.6~~	~~18.1~~
3259	BLOWOUT	APORO	Waste Permeability in CUTTINGS Model	Constant	n/a[5]	2.4E-13 sq m	n/a
3405	SOLMOD6	SOLCIM	U(VI) Solubility Limits (Castile)	Constant	n/a	4.6E-3 M	n/a

[1] The values for this parameter are dependent on the results of the expert elicitation for the particle size distribution. Once the particle size is established via the expert elicitation, TAUFAIL should be calculated based on Shields Parameter (see, for example, Simon, D.B. and Senturk, F., 1992, *Sediment Transport Technology: Water and Sediment Dynamics*) as a function of particle diameter.

[2] The minimum value should be set to the minimum value for TAUFAIL. If this parameter is no longer used in the performance assessment as a result of the 4/21/97 peer review, then no change to the parameter value is required.

[3] Once the minimum value for has been set to the minimum of TAUFAIL, the median value can be calculated based on the maximum and distribution type identified in the table.

[4] If the 4/21/97 peer review of the SPALLINGS conceptual model results in this parameter no longer being used in the performance assessment, then no change to the parameter value is required.

[5] Not Applicable

Enclosure 2 (cont). WIPP Performance Assessment Parameters Identified in the March 19, 1997 Letter Which Have Been Determined To Not Be Representative of the Data. DOE Must Use the Parameter Values Identified Below in the Performance Assessment Verification Test.

ID #	Material ID	Parameter ID	Description	Parameterization to be Used in Verification Test			
				Dist Type	Min	Median	Max
3409[6]	SOLMOD6	SOLSIM	U(VI) Solubility Limits (Salado)	Constant	n/a	3.7E-5 M	n/a
3406	SOLMOD3	SOLSIM	Oxidation State +III Model (Salado)	Constant	n/a	1.2E-7 M	n/a
3402	SOLMOD3	SOLCIM	Oxidation State +III Model (Castile)	Constant	n/a	1.3E-8 M	n/a
3403	SOLMOD4	SOLCIM	Oxidation State +IV Model (Castile)	Constant	n/a	4.1E-8 M	n/a
3407	SOLMOD4	SOLSIM	Oxidation State +IV Model (Salado)	Constant	n/a	1.3E-8 M	n/a
3404	SOLMOD5	SOLCIM	Oxidation State +V Model (Castile)	Constant	n/a	4.8E-7 M	n/a
3408	SOLMOD5	SOLSIM	Oxidation State +V Model (Salado)	Constant	n/a	2.4E-7 M	n/a
3482[7]	AM+3	MKD_AM	Matrix Partition Coefficient for Am +III	Log-uniform	20 ml/g	100 ml/g	500 ml/g
3480	PU+3	MKD_PU	Matrix Partition Coefficient for Pu +III	Log-uniform	20 ml/g	100 ml/g	500 ml/g
3481	PU+4	MKD_PU	Matrix Partition Coefficient for Pu +IV	Log-uniform	900 ml/g	4,200 ml/g	20,000 ml/g
3479	U+4	MKD_U	Matrix Partition Coefficient for U +IV	Log-uniform	900 ml/g	4,200 ml/g	20,000 ml/g
3475	U+6	MKD_U	Matrix Partition Coefficient for U +VI	Log-uniform	0.03 ml/g	0.9 ml/g	30 ml/g

[6]In the 3/19/97 letter from Ramona Trovato to Alvin Alm, information from two separate parameters was inadvertantly combined. The parameter identification number 3406 was assigned to material identification SOLMOD6 and should have been assigned to SOLMOD 3. Material identification SOLMOD6 should have had the identification number 3409. These discrepancies are accurately represented in the above table.

[7]All matrix coefficients used in the performance assessment should use the log-uniform distribution type.