

## Alicia Mullins

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**From:** Keith Compton  
**Sent:** Wednesday, April 27, 2005 1:35 PM  
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**Subject:** POP Items for MOSP meeting tomorrow  
**Attachments:** TSPA Parameter Linkages Rev 1.xls

Enclosed are discussion items for tomorrow's MOSP meeting. The focus is on the examination of the TSPA (both TSPA-FEIS and LSO version of draft TSPA-LA). I'd appreciate it if some of the participants could come ready to talk about specific questions:

- for the individuals identified as leads, please be ready to discuss how (if at all) you could use the TSPA code in their preparations
- for CNWRA PA staff, please be ready to discuss how CNWRA staff can most fruitfully participate in examination of the TSPA

To get things rolling, I will lead off with a discussion of how I plan to proceed on my main task (Model Integration). I have attached a spreadsheet that I will use to illustrate how I plan to explore model integration by documenting linkages within the TSPA code. I'd like to finish by ensuring that each of these items has an identified action item for proceeding. All of the following are of course suggestions - if anyone sees problems in these, I'd welcome alternate suggestions. Feel free to contact me if you have any questions.

Keith

### \*\*\*POP\*\*\*

Purpose: To decide on what kind of TSPA examination activities we will do between May and Sep 05

Outcome: Each "series" should have an idea of the first steps to be taken

Process: Discussion and Consensus

\*\*\*Proposed TSPA Model Examination Plan for May-Sep \*\*\* TSPA Model Examination Series (activities to run concurrently):

#### 1) TSPA11/Multiple Barriers

Lead: Leslie

Example Task: Identify areas where significant credit appears to be taken within the model by the use of non-conservative values (coordinate with Ghosh)

#### 2) TSPA12/Scenario Analysis

Lead: Johnson

Example Task: Identify consistency between the FEPS database and the model (e.g., how are the FEPS that are screened in accounted for in the model)

#### 3) TSPA13/Model Integration

Lead: Compton

Example Task: Identify the structure of the TSPA model and the connections between components; identify linkages between ISI's in terms of intermediate variables

#### 4) TSPA13/Data and Model Justification

Lead: Technical Team Leads (Csontos/Nataraja/Arlt/Trapp/Waters)

Example Task: Examine how process models have been abstracted within the TSPA-LA and consistency between AMR's and the "as-built" model.

5) TSPA13/Data and Model Uncertainty

Lead: Ghosh

Example Task: Document how data and model uncertainty is accounted for and propagated within the TSPA model

6) TSPA13/Model Support

Lead: Grossman

Example Task: Identify documentation of how the model in the TSPA is supported; examine QA status of model validation and verification

Notes:

1) CNWRA Technical staff will probably interact most through Activity 4. CNWRA PA staff will likely interact on all items.

2) Each Model series lead should be ensure that a presentation on activities within their purview will be prepared for a PA session, to occur approximately once per month. The following is a tentative schedule:

May: TSPA13/Model Integration

Jun: TSPA13/Data and Model Uncertainty

Jul: TSPA11/Multiple Barriers

Aug: TSPA13/Model Support

Sep: TSPA12/Scenario Analysis

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Name	Description / Comment	Abbr	Output from	Input to	Upstream ISI (variable is an output variable)	Downstream ISI (variable is an input variable)
Infiltration flux	used to estimate hydrologic properties	qi	INFIL	ITOUGH2- TOUGH2/ UZ flow cal	UZ1	UZ2
Infiltration flux	Used to compute drift-scale THC	qi	INFIL	TOUGHREACT	UZ1	ENG3
Infiltration flux	Used to compute multi-scale thermal hydrology	qi	TOUGH2	NUFT	UZ1	UZ2
Percolation Flux	percolation flux at repository horizon used to compute condensation fluxes	qp	TOUGH2/ mountain scale	GoldSim/ DWC Submodel	UZ2	ENG3
Percolation Flux	percolation flux at repository horizon used to compute seepage fluxes	qp	TOUGH2/ mountain scale	GoldSim/ seepage.dll	UZ2	ENG3
Percolation flux	percolation flux throughout the UZ used to determine the flow fields used for the FEHM particle tracking model	qp	TOUGH2/ mountain scale	GoldSim/ fehm.dll	UZ2	UZ3
Percolation flux	percolation flux at the base of the UZ used to determine the boundary recharge condition for the SZFT model	qp	TOUGH2/ mountain scale	FEHM/ szft	UZ2	SZ1
Hydrologic properties		H	ITOUGH2- TOUGH2/ UZ flow cal	NUFT	UZ2	UZ2
Hydrologic properties		H	TOUGH2/ UZ flow cal	TOUGH2/ drift seepage	UZ2	ENG3
Hydrologic properties		H	TOUGH2/ UZ flow cal	TOUGH2/ mountain scale	UZ2	UZ2
Hydrologic properties		H	TOUGH2/ UZ flow cal	TOUGHREACT	UZ2	ENG3
Hydrologic properties		H	TOUGH2/ UZ flow cal	GoldSim/ EBS Transport	UZ2	ENG4

Name	Description / Comment	Abbr	Output from	Input to	Upstream ISI (variable is an output variable)	Downstream ISI (variable is an input variable)
Capillary Strength Parameter		alpha		GoldSim/ seepage.dll	UZ2	ENG3
Permeability		logK		GoldSim/ seepage.dll	UZ2	ENG3
Carbonate concentration	CO3 concentration or water inside a failed WP	CO3	EQ3/6	GoldSim/ EBS Transport/IPC	ENG3	ENG4
Ionic strength	ionic strength of water inside a failed WP	I	EQ3/6	GoldSim/ EBS Transport/IPC	ENG3	ENG4
pH	pH of water inside a failed WP	pH	EQ3/6	GoldSim/ EBS Transport/IPC	ENG3	ENG4
Chloride concentration	no longer relevant - used for LC?	Cl	EQ3/6	GoldSim/ wapdeg.dll	ENG3	ENG1
Nitrate concentration	no longer relevant - used for LC?	NO3	EQ3/6	GoldSim/ wapdeg.dll	ENG3	ENG1
pH		pH	EQ3/ 6	GoldSim/ wapdeg.dll	ENG3	ENG1
Liquid flux	Dripping flux is the combination of DS and DWC	q <sub>I</sub>	GoldSim/ EBS Transport	GoldSim/ EBS Transport	ENG3	ENG4
Radionuclide mass flux			GoldSim/ EBS Transport	GoldSim/ fehm.dll	ENG4	UZ3
Seep flow rate		Qs	GoldSim/ seepage.dll	GoldSim/ EBS Transport	ENG3	ENG4
Type and number of breached WP/DS patches			GoldSim/ wapdeg.dll	GoldSim/ EBS Transport	ENG1	ENG4

Name	Description / Comment	Abbr	Output from	Input to	Upstream ISI (variable is an output variable)	Downstream ISI (variable is an input variable)
Average Time since package failure			GoldSim/ wapdeg.dll	GoldSim/ EBS Transport	ENG1	ENG4
Seismic WP/DS Damage			LS-DYNA/ ANSYS	GoldSim/ wapdeg.dll	ENG2	ENG1
Liquid saturation	invert saturation	S_I	NUFT	EQ3/ 6	ENG3	ENG3
Relative humidity	In-drift relative humidity	RH	NUFT	EQ3/ 6	ENG3	ENG3
Temperature	Waste Package surface temperature	T	NUFT	EQ3/ 6	ENG3	ENG3
Air mass fraction		X_a	NUFT	GoldSim/ EBS Transport		
Evaporation Rate		Q	NUFT	GoldSim/ EBS Transport		
Liquid flux		ql	NUFT	GoldSim/ EBS Transport	ENG3	ENG4
Liquid saturation	invert saturation	S_I	NUFT	GoldSim/ EBS Transport	ENG3	ENG4
Relative humidity	In-drift relative humidity	RH	NUFT	GoldSim/ EBS Transport	ENG3	ENG4
Temperature	Waste Package surface temperature	T	NUFT	GoldSim/ EBS Transport	ENG3	ENG4
Relative humidity	In-drift relative humidity	RH	NUFT	GoldSim/ wapdeg.dll	ENG3	ENG1

Name	Description / Comment	Abbr	Output from	Input to	Upstream ISI (variable is an output variable)	Downstream ISI (variable is an input variable)
Temperature		T	NUFT	GoldSim/ wapdeg.dll	ENG3	ENG1
Liquid saturation		S_l	TOUGH2/ mountain scale	GoldSim/ fehm.dll	UZ2	UZ3
Air mass fraction		X_a	TOUGHREAC T	EQ3/ 6	ENG3	ENG3
carbonate concentration		CO3	TOUGHREAC T	EQ3/ 6	ENG3	ENG3
Gas flux		qg	TOUGHREAC T	EQ3/ 6	ENG3	ENG3
Ionic strength		I	TOUGHREAC T	EQ3/ 6	ENG3	ENG3
pH		pH	TOUGHREAC T	EQ3/ 6	ENG3	ENG3
rockfall size and number		RF	UDEC/ 3DEC	LS-DYNA/ ANSYS	ENG2	ENG2
drift geometry		DG	UDEC/ 3DEC	TOUGH2/ drift seepage	ENG2	ENG3
rock strength		RS	UDEC/ 3DEC	TOUGH2/ drift seepage	ENG2	ENG2
DWC flow rate			GoldSim/ EBS Transport	GoldSim/ EBS Transport	ENG3	ENG4
DWC fraction			GoldSim/ EBS Transport	GoldSim/ EBS Transport	ENG3	ENG4

Name	Description / Comment	Abbr	Output from	Input to	Upstream ISI (variable is an output variable)	Downstream ISI (variable is an input variable)
Seep fraction			GoldSim/ seepage.dll	GoldSim/ EBS Transport	ENG3	ENG4
Radionuclide mass flux			GoldSim/ fehm.dll	GoldSim/ SZConvolute.dll	UZ3	SZ2
Saturated Zone transport time	Stochastic set of characteristic breakthrough curves	tSZ	TOUGH2/ SZFT	GoldSim/ SZConvolute.dll	SZ1	SZ2
Biosphere Dose Conversion Factor	BDCF values from ERMYN	BDCF	ERMYN	GoldSim/ Dose Calculation	DOSE3	TSPA14
Radionuclide mass flux	Rate that mass associated with each species enters the accessible environment		GoldSim/ SZConvolute.d ll	GoldSim/ Dose Calculation	SZ2	TSPA14