



# Scientific Analysis/Calculation Error Resolution Document

QA: QA  
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Complete only applicable items.

## INITIATION

1. Originator: Jim Houseworth/Ming Zhu	2. Date: 5/22/08	3. ERD No. ANL-NBS-HS-000058 ERD 02
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4. Document Identifier: ANL-NBS-HS-000058 REV 00	5. Document Title: Calibrated Unsaturated Zone Properties
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6. Description of and Justification for Change (Identify applicable CRs and TBVs):

### I Background Information Summary

This ERD is prepared to resolve CR 12142 associated with *Calibrated Unsaturated Zone Properties*, ANL-NBS-HS-000058 REV 00 (SNL 2007 [DIRS 179545]).

**CR 12142:** During the extent of condition review for CR 12142, the same error identified in CR 12142 was found in Table 6-1 of *Calibrated Unsaturated Zone Properties*, ANL-NBS-HS-000058 REV 00 (SNL 2007 [DIRS 179545]). Table 6-1 in *Calibrated Unsaturated Zone Properties*, ANL-NBS-HS-000058 REV 00 (SNL 2007 [DIRS 179545]) correlates the UZ model layers with hydrogeologic units for the Paintbrush Group (layers beginning with "Tp") as defined in Buesch et al. 1996 [DIRS 100106], Table 4. The lithostratigraphic unit at the base of the major unit "TSw" is shown as "Tptpv2". The corresponding UZ model layer is listed as "tsw39 (vit,zeo)" and the corresponding hydrogeologic unit is listed as "PV2". According to the source information in Buesch et al. 1996 [DIRS 100106], Table 4, the "PV2" (short for Tptpv2) is the uppermost lithostratigraphic unit in the major unit "CHn". The error in the unit classification has no impact on the output from the UZ flow model.

Other reports that have this same error are listed in ERD 01 of *Development of Numerical Grids for UZ Flow and Transport Modeling*, ANL-NBS-HS-000015 REV 02 (BSC 2004 [DIRS 169855]). There is no impact of this error in SNL (2007 [DIRS 179545]) on any downstream technical products.

(see attached)

## CONCURRENCE

	Printed Name	Signature	Date
7. Checker	Charles Haukwa		05/22/2008
8. QCS/QA Reviewer	Peter Persoff		05/22/2008

## APPROVAL

9. Originator	Jim Houseworth Ming Zhu		05/22/2008 5/22/08
10. Responsible Manager	Paul Dixon		5-22-08

(Continued from Block 6)

The following documents that cite ANL-NBS-HS-000058 REV 00 [DIRS 179545] were checked for impacts as a result of this correction:

- ANL-NBS-HS-000047 REV 01, *THC Sensitivity Study of Heterogeneous Permeability and Capillarity Effects*
- ANL-NBS-HS-000057 REV 00, *Postclosure Analysis of the Range of Design Thermal Loadings*
- ANL-WIS-MD-000024 REV 01, *Postclosure Nuclear Safety Design Bases*
- ANL-WIS-MD-000027 REV 00, *Features, Events, and Processes for the Total System Performance Assessment: Analyses*
- ANL-WIS-PA-000001 REV 03, *EBS Radionuclide Transport Abstraction*
- MDL-NBS-HS-000019 REV 01 AD 01, *Abstraction of Drift Seepage*
- MDL-NBS-HS-000020 REV 02 AD 01, *Particle Tracking Model and Abstraction of Transport Processes*
- MDL-NBS-HS-000023 REV 01 AD 01, *Simulation of Net Infiltration for Present-Day and Potential Future Climates*
- MDL-WIS-PA-000005 REV 00 AD 01, *Total System Performance Assessment Model/Analysis for the License Application*
- DOE/RW-0573, *Yucca Mountain Repository SAR*
- TDR-NBS-HS-000020 REV 00, *Data Qualification Report for Simulation of Net Infiltration for Present Day and Potential Future Climates Preliminary Output*

## **II Inputs and/or Software**

None

## **III Analysis and Results**

In Table 6-1 in *Calibrated Unsaturated Zone Properties*, ANL-NBS-HS-000058 REV 00 (SNL 2007 [DIRS 179545]), the lithostratigraphic unit at the base of the major unit “Tsw” is shown as “Ttpv2”. The corresponding UZ model layer is listed as “tsw39 (vit, zeo)” and the corresponding hydrogeological unit is listed as “PV2”. According to the source information in Buesch et al. (1996 [DIRS 100106], Table 4, the “PV2” unit (short for Ttpv2) is the uppermost lithostratigraphic unit of the major unit “CHn”. This correction to Table 6-1 in *Calibrated Unsaturated Zone Properties*, ANL-NBS-HS-000058 REV 00 (SNL 2007 [DIRS 179545]) is given in Table 1 below. Note also that the designation of “tsw39” as the top model layer for the

Calico Hills nonwelded (CHn) major unit (see Table 1) has no effect on the development of the UZ properties for use in the UZ flow model.

Table 1. GFM2000 Lithostratigraphy, Unsaturated Zone Model Layer, and Hydrogeologic Unit Correlation

Major Unit (Modified from Montazer and Wilson 1984 [DIRS 100161])	GFM2000 Lithostratigraphic Nomenclature	Unsaturated Zone Model Layer	Hydrogeologic Unit (Flint 1998 [DIRS 100033], Table 1)	
Tiva Canyon welded (TCw)	Tpcr	tcw11	CCR, CUC	
	Tpcp	tcw12	CUL, CW	
	TpcLD			
	Tpcpv3	tcw13	CMW	
	Tpcpv2			
Paintbrush nonwelded (PTn)	Tpcpv1	ptn21	CNW	
	Tpbt4	ptn22	BT4	
	Tpy (Yucca)	ptn23	TPY	
		ptn24	BT3	
	Tpbt3			
	Tpp (Pah)	ptn25	TPP	
	Tpbt2	ptn26	BT2	
	Tptrv3			
	Tptrv2			
Topopah Spring Welded (TSw)	Tptrv1	tsw31	TC	
	Tptrn			
		tsw32	TR	
	Tptrl, Tptf	tsw33	TUL	
	Tptpul, RHHtop			
	Tptpmn	tsw34	TMN	
	Tptpll	tsw35	TLL	
	Tptpln	tsw36	TM2 (upper 2/3 of Tptpln)	
		tsw37	TM1 (lower 1/3 of Tptpln)	
	Tptpv3	tsw38	PV3	
	Calico Hills nonwelded (CHn)	Tptpv2	tsw39 (vit, zeo)*	PV2
		Tptpv1	ch1 (vit, zeo)	BT1 or BT1a (altered)
		Tpbt1		
Tac (Calico)		ch2 (vit, zeo)	CHV (vitric) or CHZ (zeolitic)	
		ch3 (vit, zeo)		
		ch4 (vit, zeo)		
		ch5 (vit, zeo)		
Tacbt (Calicobt)		ch6 (vit, zeo)	BT	
Tcpuv (Prowuv)		pp4	PP4 (zeolitic)	
Tcpuc (Prowuc)		pp3	PP3 (devitrified)	
Tcpmd (Prowmd)		pp2	PP2 (devitrified)	
Tcplc (Prowlc)				
Tcplv (Prowlv)		pp1	PP1 (zeolitic)	
Tcpbt (Prowbt)				
Tcbuv (Bullfroguv)				
Crater Flat undifferentiated (CFu)	Tcbuc (Bullfroguc)	bf3	BF 3 (welded)	
	Tcbmd (Bullfrogmd)			
	Tcblc (Bullfroglc)			
	Tcblv (Bullfroglv)	bf2	BF2 (nonwelded)	
	Tcbbt (Bullfrogbt)			
	Tctuv (Tramuv)			
	Tctuc (Tramuc)	tr3	Not Available	
	Tctmd (Trammd)			
	Tctlc (Tramlc)			
	Tctlv (Tramlv)			
	Tctbt (Trambt) and below	tr2	Not Available	

Source: BSC 2004 [DIRS 169855], Table 6-5.

\* The designation of "tsw39" as the top model layer for the Calico Hills nonwelded (CHn) major unit has no effect on the development of the UZ properties for use in the UZ flow model.

#### **IV Impact Evaluation**

This change corrects an error in Table 6-1 of SNL (2007 [DIRS 179545]). The "Tptpv2" lithostratigraphic unit, and the corresponding "tsw39 (vit, zeo)" UZ model layer and "PV2" hydrogeologic unit have been moved from the "TSw" major unit to the "CHn" major unit. This placement has no impact because the "TSw" and "CHn" major units are not used for the development of hydrological properties. This change has no impact on the conclusions of SNL (2007 [DIRS 179545]) or on any downstream technical product or TSPA.