# Transient Numerical Model

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Chapter F of

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**Table F–13.** Calibrated vertical anisotropy parameters.

[Abbreviations: ICU, intrusive-rock confining unit; LCA, lower carbonate-rock aquifer; LCA_T1, thrusted lower carbonate-rock aquifer; LCCU, lower clastic-rock confining unit; LCCU_T1, thrusted lower clastic-rock confining unit; NA, not applicable; OAA, older alluvial aquifer; OACU, older alluvial confining unit; UCCU, upper clastic-rock confining unit; XCU, crystalline-rock confining unit; YAA, younger alluvial aquifer; YACU, younger alluvial confining unit]

| Parameter name | Description | Vertical anisotropy value[1] | Composite scaled sensitivity | Coefficient of variation[2] |
|---|---|---|---|---|
| K1_VANI | Confining units (XCU, ICU, UCCU, LCCU, and LCCU_T1) | 1.267 | 0.132 | 0.5 |
| K2CARBVANI | UCA, LCA, and LCA_T1 | 1.00 | 0.125 | 0.5 |
| K3_VOLVANI | Volcanic-rock units | 1.00 | 0.273 | 0.47 |
| K4_VFVANIA | Basin-fill aquifers (YAA, OAA, coarser grained parts of upper VSU) | 5,000.0 | 0.119 | NA |
| K4_VFVANIC | Basin-fill confining units (YACU, OACU, finer grained parts of upper VSU) | 5,000.0 | 0.215 | NA |
| K4_VFVANVL | Lower VSU | 2.184 | 0.233 | 0.5 |

[1]Ratio of horizontal to vertical (values less than 1 indicate higher vertical than horizontal hydraulic conductivity).

[2]Values were log transformed.

**Table F–14.** Calibrated storage property values.

[Specific-yield values were used for layer 1, specific-storage values were used for layers 2–16. Values in parentheses for comparison with storage-property values. Abbreviations: ICU, intrusive-rock confining unit; LCCU, lower clastic-rock confining unit; LCCU_T1, thrusted lower clastic-rock confining unit; OAA, older alluvial aquifer; OACU, older alluvial confining unit; UCCU, upper clastic-rock confining unit; XCU, crystalline-rock confining unit; YAA, younger alluvial aquifer; YACU, younger alluvial confining unit]

| Parameter name | Description | Range of storage properties (specific storage $m^{-1}$) | Composite scaled sensitivity | Storage parameter value |
|---|---|---|---|---|
| STOR_12 | Confining units (XCU, ICU, UCCU, LCCU, LCCU_T1); Carbonate-rock aquifers (LCA, LCA_T1, UCA) | [1]$1.5\times10^{-8}$ – [2]$6.3\times10^{-2}$ | 16,127.0 | $7.0\times10^{-8}$ |
| STOR_34 | Volcanic-rock units; Lower VSU; Basin-fill aquifers (YAA, OAA, LA, upper VSU) | [3]$9.7\times10^{-7}$ – [4]$2\times10^{-2}$ | 5,598.5 | $1.0\times10^{-5}$ |
| STOR_4VUP | Upper VSU - fine grained, Pahrump Valley | [3]$4.7\times10^{-7}$ – [2]$4\times10^{-2}$ | 424.9 | $7.5\times10^{-5}$ |
| STOR_4C | Basin-fill confining units (YACU, OACU) | [3]$4.7\times10^{-7}$ – [2]$4\times10^{-2}$ | 50.6 | $5.0\times10^{-5}$ |
| SY_OTHER | Specific yield for layer 1 in basin-fill units outside the Pahrump Valley (except for upper and lower VSU) | [1,2,3,4]0.001 – 0.47 | 9.5 | $1.9\times10^{-1}$ |
| SY_PAH | Specific yield for layer 1 in basin-fill units in the Pahrump Valley | [1,2,3,4]0.001 – 0.47 | 13.1 | $2.0\times10^{-1}$ |
| SY_PUMP | Specific yield for layer 1 in VSU (upper and lower) outside the Pahrump Valley | [1,2,3,4]0.001 – 0.47 | 8.7 | $1.9\times10^{-1}$ |

[1]Schaeffer and Harrill, 1995.

[2]Belcher and others, 2001.

[3]Thomas and others, 1996.

[4]Anderson and Woessner, 1992.

in that they supported the hydraulic gradients (table F–15 and fig. F–5). In particular, the B_LVVSZ_IS parameter (representing part of the LVVSZ) and the B_SOLTARIO parameter (representing the Solitario Canyon fault) have been well documented as to their potential effect on heads in the model domain and had a significant effect on the simulated heads. In most cases, the other potential barriers were found to be unimportant or were adequately represented by the juxtaposition of HGUs in the HFM (Chapter E, this volume).

## Recharge

Recharge in the DVRFS model was initially defined using one parameter to vary the net infiltration (Hevesi and others, 2003) throughout the entire model domain by a constant factor (fig. F–6). The *CSS* value for this parameter during initial model runs was high and generally within the top three most sensitive parameters, indicating that adequate observations existed to describe recharge with additional parameters. Early model runs tended to overestimate net recharge, as was