Parameter	Variable	Description (unit)	Range	Calibrated value	
				TCW	GW
CN2[1]	Streamflow	Curve number	−50–50 %	−30 %	0 %
ESCO[1]		Soil evaporation compensation factor	0–1	1	0.95
SURLAG[1]		Surface runoff lag coefficient	0.5–24	0.5	0.5
SOL_AWC[1]		Available water capacity of the soil layer ($m\,H_2O\,mm\,soil^{-1}$)	−50–50 %	−10 %	−1 %
SOL_K[1]		Saturated hydraulic conductivity ($mm\,h^{-1}$)	−50–50 %	50 %	49 %
SOL_Z[1]		Depth from soil surface to bottom of layer (mm)	−50–50 %	−20 %	−31 %
ALPHA_BF[1]		Baseflow recession constant ($1\,days^{-1}$)	0–1	0.07	0.051
GW_DELAY[1]		Groundwater delay time (days)	0–500	120	45
GW_REVAP[1]		Groundwater "revap" coefficient	0.02–0.2	0.10	0.02
RCHRG_DP[1]		Deep aquifer percolation fraction	0–1	0.01	0.05
GWQMN[1]		Threshold depth of water in the shallow aquifer required for return flow to occur (mm)	0–5000	1.9	1.0
CH_K2[1]		Effective hydraulic conductivity ($mm\,h^{-1}$)	0–150	0	20
CH_N2[1]		Manning coefficient	0.01–0.3	0.29	0.021
NPERCO[2]	Nitrate	Nitrogen percolation coefficient	0.01–1	0.5	0.2
N_UPDIS[2]		Nitrogen uptake distribution parameter	5–50	50	50
ANION_EXCL[2]		Fraction of porosity from which anions are excluded	0.1–0.7	0.59	0.6
ERORGN[2]		Organic N enrichment ratio for loading with sediment	0–5	4.92	4.1
BIOMIX[2]		Biological mixing efficiency	0.01–1	0.01	0.01
SOL_NO3[3]		Initial NO_3 concentration in soil layer ($mg\,N\,kg^{-1}$)	0–100	11.23	0
CDN[4]		Denitrification exponential rate coefficient	0–3.0	0.3	1.8
SDNCO[4]		Denitrification threshold water content	0.1–1.1	1.0	1.0

* refers to a default value. The ranges of parameters with superscripts (1–4) were adapted from Gitau and Chaubey (2010), Yeo et al. (2014), Seo et al. (2014), and Neitsch et al. (2011), respectively.