

# Effective Hydraulic Conductivity ( $K_e$ )

March 2025

Sand:  $K_e = 2.40 * \exp(1.81 * V_G + 1.059 * V_F)$

Loamy Sand:  $K_e = 2.20 * \exp(1.81 * V_G + 1.059 * V_F)$

Sandy Loam:  $K_e = 1.90 * \exp(1.81 * V_G + 1.059 * V_F)$

Loam:  $K_e = 1.40 * \exp(1.81 * V_G + 1.059 * V_F)$

Silt Loam:  $K_e = 1.70 * \exp(1.81 * V_G + 1.059 * V_F)$

Silt:  $K_e = 2.25 * \exp(1.81 * V_G + 1.059 * V_F)$

Sandy Clay Loam:  $K_e = 1.13 * \exp(1.81 * V_G + 1.059 * V_F)$

Clay Loam:  $K_e = 0.90 * \exp(1.81 * V_G + 1.059 * V_F)$

Silty Clay Loam:  $K_e = 0.93 * \exp(1.81 * V_G + 1.059 * V_F)$

Sandy Clay:  $K_e = 0.72 * \exp(1.81 * V_G + 1.059 * V_F)$

Silty Clay:  $K_e = 0.61 * \exp(1.81 * V_G + 1.059 * V_F)$

Clay:  $K_e = 0.37 * \exp(1.81 * V_G + 1.059 * V_F)$

Where:

$V_G$  is the fraction of vegetation ground cover (litter cover and plant basal cover)

$V_F$  is the fraction of vegetation foliar cover (bunch grass, sod grass, shrub, and forb)

Reference: Al-Hamdan, O. Z., J. C. Williams, F. B. Pierson, M. Hernandez, and S. K. Nouwakpo, 2024. Estimating effective hydraulic conductivity ( $K_E$ ) for the Rangeland Hydrology and Erosion Model (RHEM). *Journal of the ASABE*, Vol. 67(1):141-149.