APPENDIX 1: THORNTHWAITE METHOD

To calculate Potential Evapotranspiration (PET) using Thornthwaite method, first the Monthly Thorthwaite Heat Index ($i$) calculation is required, using the following formula:

$$i = \left( \frac{t}{5} \right)^{1.514}$$

where $t$ is the mean monthly temperature.

The Annual Heat Index ($I$) is calculated, as the sum of the Monthly Heat Indices ($i$):

$$I = \sum_{i=1}^{12} i$$

A Potential Evapotranspiration (PET) estimation is obtained for each month, considering a month is 30 days long and there are 12 theoretical sunshine hours per day, applying the following equation:

$$PET_{\text{non corrected}} = 16 \cdot \left( \frac{10 \cdot t}{I} \right)^{\alpha}$$

Where $\alpha$ is

$$\alpha = 675 \cdot 10^{-9} \cdot I^3 - 771 \cdot 10^{-7} \cdot I^2 + 1792 \cdot 10^{-5} \cdot I + 0.49239$$

Obtained values are later corrected according to the real length of the month and the theoretical sunshine hours for the latitude of interest, with the formula:

$$PET = PET_{\text{non corrected}} \cdot \frac{N}{12} \cdot \frac{d}{30}$$

$N$: are the theoretical sunshine hours for each month and $d$ number of days for each month.