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:

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

Where α 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:

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

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