

From CIRIA (2015)

Eq 24.3 IH124: Catchment Descriptor Equation

$$Q_{BAR} = 0.00108 \text{ Area}^{0.89} \times \text{SAAR}^{1.17} \times \text{SOIL}^{2.17}$$

Q_{BAR} = Mean annual flood

Area = Area of Catchment in km^2

SAAR = Standard Average Annual Rainfall 1940-1970 in mm.

SOIL = Soil Index from FSR soil maps

Where the site is less than 50 ha, the formula should be applied for 50 ha and the result factored based on the ratio of the actual site area and the applied area (50 ha).

Area = 0.5 km^2 (Smallest value equation works for)

SAAR = 1136 mm (Derived from FSR based on location)

SOIL = 0.37 (Based on WRAP Soil Type)

$$\begin{aligned} Q_{BAR} &= 0.00108 \times 0.5^{0.89} \times 1136^{1.17} \times 0.37^{2.17} \\ &= 0.2602 \quad (\text{But this is for a } 50 \text{ km}^2 \text{ site}) \end{aligned}$$

$$\Rightarrow 0.2602 \div 50 = 5.203 \times 10^{-3} \text{ m}^3/\text{s/ha}$$

For our 1.01 ha site

$$5.203 \times 10^{-3} \times 1.01 = 5.26 \times 10^{-3} \text{ m}^3/\text{s}$$

Convert to litres

$$5.26 \times 10^{-3} \times 1000 = \underline{\underline{5.25 \text{ l/s}}}$$