

ARUP		Calculation sheet	Job No.	Sheet No.	Rev.
			076462	01	
			Member Location		
Job title			Drg. Ref. <i>Mass - balance</i>		
<i>MSc Data Academy</i>			Made by <i>OP</i>	Date <i>15/7-22</i>	Chd.

99/1e - initial mass balance

Definition: $\begin{cases} Q: \text{flow, in l/s}^* \\ C: \text{concentration, in mg/L} \\ V: \text{volume in L} \\ M: \text{mass in mg} \end{cases}$

Over a time t :

$$\begin{aligned} V_{u/s} &= Q_{u/s} \cdot t \\ M_{u/s} &= V_{u/s} \cdot C_{u/s} \end{aligned} \quad \left| \quad \begin{aligned} V_{C_{SO}} &= Q_{C_{SO}} \cdot t \\ M_{C_{SO}} &= V_{C_{SO}} \cdot C_{C_{SO}} \end{aligned} \right. \begin{aligned} & \text{volume of flow} \\ & \text{Mass of pollutant} \end{aligned}$$

$$M_{D/s} = M_{u/s} + M_{C_{SO}} \quad \left| \quad \begin{aligned} & \text{Total mass of} \\ & \text{pollutant} \end{aligned} \right.$$

$$Q_{D/s} = Q_{u/s} + Q_{C_{SO}} \quad \left| \quad \begin{aligned} & \text{Flow d/s} \end{aligned} \right.$$

$$V_{D/s} = Q_{D/s} \cdot t \quad \left| \quad \begin{aligned} & \text{volume d/s} \end{aligned} \right.$$

$$C_{D/s} = \frac{M_{D/s}}{V_{D/s}}$$

$$\left| \quad \begin{aligned} & \text{Concentration} \\ & \text{of pollutant} \\ & \text{d/s} \end{aligned} \right.$$