

Problem 6.1

A small stream was found to be contaminated with Lindane, a pesticide known to cause convulsions and liver damage. Groundwater wells in the same region have also been found to contain Lindane, and so you suspect that river contamination is due to groundwater inflow. To test your theory you conduct a dye study. Based on the information given below, estimate the ground water volume flux, Q_{GW} , and the concentration of Lindane, $C_{L_{GW}}$, in the groundwater.

Station 1: A 50-mg/l solution of tracer is injected at the rate of $Q_i = 100\text{cm}^3/\text{s}$.

Station 2: Located 100-m downstream of Station 1.
Dye concentration, $C_{\text{dye}} = 10 \mu\text{g/l}$
Lindane concentration, $C_{L2} = 0.5 \mu\text{g/l}$

Station 3: Located 200-m downstream of Station 1.
Dye concentration, $C_{\text{dye}} = 8 \mu\text{g/l}$
Lindane concentration, $C_{L3} = 0.9 \mu\text{g/l}$