The regularised Serre equations are

$$h_t + (uh)_x = 0 \tag{1a}$$

$$(uh)_t + \left(u^2 h + \frac{gh^2}{2} + \epsilon h^2 \left[h\left[(u_x)^2 - uu_{xx} - u_{xt}\right] - g\left(h\frac{\partial^2 h}{\partial x^2} + \frac{1}{2}\frac{\partial h}{\partial x}\frac{\partial h}{\partial x}\right)\right]\right)_x = 0 \tag{1b}$$

Lets group time derivatives

$$h_t + u_x h + u h_x = 0 \tag{2a}$$

$$(uh)_t + 3\epsilon h^2 h_x u_{xt} + \epsilon h^3 u_{xtx} + \left(u^2 h + \frac{gh^2}{2} + \epsilon h^2 \left[h\left[(u_x)^2 - uu_{xx} - u_{xt}\right] - g\left(h\frac{\partial^2 h}{\partial x^2} + \frac{1}{2}\frac{\partial h}{\partial x}\frac{\partial h}{\partial x}\right)\right]\right)_x = 0 \tag{2b}$$

equivalently

$$h_t + u_x h + u h_x = 0 \tag{3a}$$

$$u_t + uu_x + gh_x + \frac{\epsilon}{h}\left(h^3\left[(u_x)^2 - uu_{xx} - u_{xt}\right] - gh^2\left(h\frac{\partial^2 h}{\partial x^2} + \frac{1}{2}\frac{\partial h}{\partial x}\frac{\partial h}{\partial x}\right)\right)_x = 0 \tag{3b}$$

Obvious way:

$$\frac{\partial h}{\partial t} + \frac{\partial (uh)}{\partial x} = 0 \tag{4a}$$

$$\frac{\partial G}{\partial t} + \frac{\partial}{\partial x}\left[uG + \frac{gh^2}{2} - \epsilon h^2\left(2h\frac{\partial u}{\partial x}\frac{\partial u}{\partial x} + gh\frac{\partial^2 h}{\partial x^2} + \frac{g}{2}\frac{\partial h}{\partial x}\frac{\partial h}{\partial x}\right)\right] = 0 \tag{4b}$$

where

$$G = uh - \epsilon\frac{\partial}{\partial x}\left(h^3\frac{\partial u}{\partial x}\right) \tag{5}$$

Lets see

$$\frac{\partial G}{\partial x} = \frac{\partial (uh)}{\partial x} - \epsilon\frac{\partial^2}{\partial x^2}\left(h^3\frac{\partial u}{\partial x}\right) \tag{6}$$

Then

$$\frac{\partial h}{\partial t} + \frac{\partial}{\partial x}\left[G + \epsilon\frac{\partial}{\partial x}\left(h^3\frac{\partial u}{\partial x}\right)\right] = 0 \tag{7}$$

$$\frac{\partial h}{\partial t} + \frac{\partial}{\partial x}\left[G + \epsilon\left[3h^2 h_x u_x + h^3 u_{xx}\right]\right] = 0 \tag{8}$$

$$\frac{\partial h}{\partial t} + G_x + \epsilon\left[\right]\frac{\partial}{\partial x}\left[G + \epsilon\left[3h^2 h_x u_x + h^3 u_{xx}\right]\right] = 0 \tag{9}$$