where $A_2 = (1 - \tau_1'/l^2)^{-1}\,(1 - \tau''/l^2)^{-1}$

$$B_2 = A(\tau_1')\,B(\tau_1')(1 - \tau''/\tau_1')^{-1} - (1 - \tau_1'/l^2)^{-1}(1 - \tau''/\tau_1')^{-1}$$

$$C_2 = (1 + S_2\sqrt{\tau''}/\lambda)^{-1}\,[(\sqrt{\tau''}/l)(1 + S_2 l/\lambda)\,A_2 + \sqrt{\tau''/\tau_1'}\,(1 + S_2\sqrt{\tau_1'}/\lambda)\,B_2] \qquad (12)$$

and

$$D_2 = (1 + S_2\sqrt{\tau''}/\lambda)^{-1}\,[(1 - \sqrt{\tau''}/l)\,A_2 + (1 - \sqrt{\tau''/\tau_1'})\,B_2]$$

The expression for the distribution of fissions produced by second-group neutrons obtained by differentiating Eq. 11b with respect to τ'', multiplying by σ_f considered as a function of τ'', and integrating from $\tau'' = 0$ to $\tau'' = \tau_2'' = \tau_2 - \tau_1$ is

$$I\,f_s^{(2)}(x)\,dx = I\,F_2\,\exp(x/L_2)\,d(x/L_2),\ x = 0 \qquad (13)$$

where

$$F_2 = [(3L_2)/(2\lambda l)(1 - \tau_1'/l^2)]\,\{\int_0^{\tau_2''} d\tau''\,\sigma_f A'B'(A' + B') - (\sqrt{\tau_1'}/l)(1 + S_1 l/\lambda)\,B(\tau_1')\int_0^{\tau_2''} d\tau''\,\sigma_f C'B'(C' + B')] \qquad (14)$$

The functions A', B', and C' are similar to A and B defined in Eq. 5. They are:

$$A' = (1 + \sqrt{\tau''}/l)^{-1}, \quad B' = (1 + S_2\sqrt{\tau''}/\lambda)^{-1}, \quad C' = (1 + \sqrt{\tau''/\tau_1'})^{-1} \qquad (15)$$

Here S_2 is the ratio between the second-group average mean free path (Λ_2) and diffusion length (L_2) in the active material.

Neutrons which have been thermalized in the water (i.e., reached an age τ_2) are considered as the source of a thermal neutron group designated by the subscript, 3. Their energy is limited to an approximately Maxwellian distribution. The strength of the source of thermal neutrons, Q_3, is simply the number of neutrons per cm^3 removed per sec from the second group given by Eq. 11a.

$$Q_3 \equiv [\lambda(n\nu)_2/3\tau''] = (I/l)[A_2(\tau'')\,e^{-x/l} + B_2(\tau_2'')\,e^{-x/\sqrt{\tau_1'}} + C_2(\tau_2'')\,e^{-x/\sqrt{\tau_2''}}] \qquad (16)$$

$\tau'' = \tau_2''$