Land Application Loading Equations

1. **Hydraulic Loading**

$$L_w + \mathrm{Pr} = ET + W_p + R$$

Where Lw = wastewater hydraulic loading rate, (in/mo)
Pr = design precipitation, (in/mo)
ET = evapotranspiration, (in/mo)
Wp = percolating water, (in/mo) [must = 0 for overland flow systems]
R = net runoff, (in/mo) [must = 0 for slow rate system]

2. **Nitrogen Loading**

$$L_n + K = U + D + 2.7WpCp$$

where Ln = 2.7CnLw = wastewater nitgrogen loading (lb/acre-yr)
Cn = applied nitrogen concentration from the pretreatment facility (mg/l).
Lw = wastewater hydraulic loading, (ft/yr)
2.7 = conversion factor.
K = All other nitrogen sources, (lb/acre-yr)
U = Crop nitrogen uptake, (lb/acre-yr)
D = Denitrification, (lb/acre-yr)
Wp = Percolating water, (ft/yr)
Cp = Percolate nitrogen concentration, (mg/l)

3. **Nitrogen Loading**

Total Effluent Nitrogen concentration =	mg/L
Total Wastewater volume to be land applied from storage cell =	MG
Total Effluent Nitrogen mass with 20% loss (Conc. Mg/L X volume MG x 8.34) =	lb
Available Land application area =	Acres
Effluent Nitrogen Loading Rate (Mass lb/Area Acres) =	lb/Acre

4. **Phosphorous Loading**

Total Effluent Phosphorous concentration =	mg/L
Total Wastewater volume to be land applied from storage cell =	MG
Total Effluent Phosphorous mass (Conc. Mg/L X volume MG x 8.34) =	lb
Available Land application area =	Acres
Effluent Phosphorous Loading Rate (Mass lb/Area Acres) =	lb/Acre