6.4.4 EQUIVALENT DNAPL MASS – Present in Dissolved Plume.

Table 5-3. Equivalent DNAPL mass associated with some relatively well-documented organic contaminant plumes in sand-gravel aquifers (modified from Mackay and Cherry, 1989).

SITE LOCATION AND PLUME MAP	PRESUMED SOURCES	PREDOMINANT DNAPL CONTAMINANTS	PLUME VOLUME (LITERS)	ESTIMATED CHEMICAL MASS DISSOLVED IN PLUME (AS EQUIVALENT DNAPL VOLUME IN LITERS OR 55-GAL DRUMS)
 Ocean City, NJ	chemical plant	Trichloroethene 1,1,1-Trichloroethane Tetrachloroethene	5,700,000,000	15,000 (72 drums)
 Mountain View, California	electronics plant	Trichloroethene 1,1,1-Trichloroethane	6,000,000,000	9800 (47 drums)
 Cape Cod, Ma.	sewage infiltration beds	Trichloroethene Tetrachloroethene	40,000,000,000	1500 (7 drums)
 Gloucester, Ont.	special waste landfill	1,4-Dioxane Freon 113	102,000,000	190 (0.9 drum)
 San Jose, Cal.	electronics plant	1,1,1-Trichloroethane Freon 113 1,1-Dichloroethene	5,000,000,000	130 (0.6 drum)
 Denver, Colorado	trainyard, airport	1,1,1-Trichloroethane Trichloroethene Dibromochloropropane	4,500,000,000	80 (0.4 drum)

Evaluate total NAPL (dissolved) in plume → Evaluate source NAPL (volume).

Plume = Dissolved mass + Sorbed mass

$$M_T = C n V_T + C^* \rho_b V_T$$

$$C^* = K_d C \left(\frac{M}{M}\right)$$

$$\boxed{M_T = C n V_T R} \leftarrow R = \left[1 + \frac{\rho_b}{n} K_d\right]$$