Wastewater Engineering

Treatment and Reuse

Fourth Edition

Metcalf & Eddy, Inc.

Revised by

George Tchobanoglous
Professor Emeritus of Civil and Environmental Engineering
University of California, Davis

Franklin L. Burton
Consulting Engineer
Los Altos, California

H. David Stensel
Professor of Civil and Environmental Engineering
University of Washington, Seattle

Boston Burr Ridge, IL Dubuque, IA Madison, WI New York
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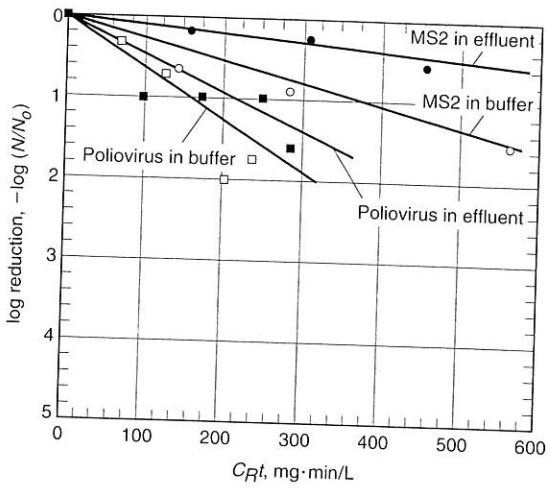

Figure 12–15
Inactivation of MS2 coliphage and poliovirus with combined chlorine. (*From BioVir Laboratories, 2001.*)

Table 12–13
Typical chlorine dosages, based on combined chlorine unless otherwise indicated, required to achieve different effluent total coliform disinfection standards for various wastewaters based on a 30-min contact time[a]

Type of wastewater	Initial coliform count, MPN/100 mL	Chlorine dose, mg/L			
		Effluent standard, MPN/100 mL			
		1000	200	23	≤2.2
Raw wastewater	10^7–10^9	15–40			
Primary effluent	10^7–10^9	10–30	20–40		
Trickling filter effluent	10^5–10^6	3–10	5–20	10–40	
Activated-sludge effluent	10^5–10^6	2–10	5–15	10–30	
Filtered activated-sludge effluent	10^4–10^6	4–8	5–15	6–20	8–30
Nitrified effluent	10^4–10^6	4–12	6–16	8–18	8–20
Filtered nitrified effluent	10^4–10^6	4–10	6–12	8–14	8–16
Microfiltration effluent	10^1–10^3	1–3	2–4	2–6	4–10
Reverse osmosis[b]	~0	0	0	0	0–2
Septic tank effluent	10^7–10^9	20–40	40–60		
Intermittent sand filter effluent	10^2–10^4	1–5	2–8	5–10	8–18

[a] Adapted in part from U.S. EPA (1986); White (1999).
[b] Based on free chlorine.

for total coliform, based on a contact time of 30 min, are reported in Table 12–13. It should be noted that the dosage values given in Table 12–13 are only meant to serve as a guide for the initial estimation of the required chlorine dose. As noted above, site-specific testing is required to establish the appropriate chlorine dose. Estimation of the required chlorine dose is illustrated in Example 12–5.