

Appendix 7-A  
Activated Sludge Design Parameters

Process	Flow Model	F/M (lb/day BOD MLVSS)	Sludge Age (Days)	MLSS (mg/L)	Detention Time (hr)	Basin Loading (lb/day BOD per 1,000 cu ft tank volume)	Activated Sludge Return Rate
Conventional	Plug Flow	0.2-0.4 (a)	5-15 (a)(c)	1,500-3,000 (a)(c)	4-8 (a)(b)(c)	20-40(a)	0.25-1.0
Complete Mix	Complete Mix	0.2-0.6 (a)	5-15 (a)(c)	2,000-5,000(a)	3-5(a)(c)	20-80	0.25-1.0(a)(c)
Step Aeration	Plug	0.2-0.5 (d)	5-15 (a)(c)	1,500-3,000(a)(c)	3-5(a)(c)	20-60	0.25-0.75(a)(c)
Contact Stabilization	Plug or Complete Mix	.02-0.6 (a)(c)(d)	5-15 (a)(c)	1,000-4,000(a)(Contact) 4,000-6,000 (Reaeration)	0.5-1.5 (a) 3-6	30-75(a)	0.25-1.0(a)
Extended Aeration	Plug or Complete Mix	0.05-0.15 (a)	10-30(a)	2,000-6,000(a)	18-36(a)	10-25(a)	0.25-1.5(a)
High Rate	Complete Mix	0.4-1.5 (a)	5-10(a)	3,000-6,000(c)	1-3(c)	70-180(b)	0.3-1.0(b)
Kraus Process	Plug	0.3-0.8(c)	5-15(c)	2,000-3,000(c)	4-8(c)	37-99(c)	0.5-1.0(c)

- a. State of Washington Design Criteria
- b. Wastewater Treatment Plant Design: WPCF Manual of practice
- c. Waste Engineering: Treatment - Disposal - Reuse : Metcalf & Eddy, Inc 1991 3rd Edition page 550
- d. Recommended Standards for Sewage Works (10 States Standards): 1990, page 90-7