STANDARD 350 - 2019

ONSITE RESIDENTIAL AND COMMERCIAL WATER REUSE TREATMENT SYSTEMS

The performance of the system shall be evaluated for a minimum of 26 weeks. During the testing and evaluation period, the system shall be subjected to 16 weeks of design loading, followed by 7.5 weeks (52 days) of stress loading, and an additional period of design loading to obtain a minimum of 55 influent and effluent data sets collected during non-stress dosing period.

The system shall be dosed 7 days per week with a wastewater volume equivalent to the daily hydraulic capacity of the system. The following schedule shall be adhered to for dosing:

Design Loading	
Time Frame	Percent Rated Daily Hydraulic Capacity
6-9 AM	35
11AM-2PM	25
5-8 PM	40

Stress loading

Stress loading sequences shall begin in week 17 of the testing and will be completed in the order listed in the following sections. Each stress sequence shall be separated by 7 days of design loading.

Wash-day stress

The wash-day stress shall consist of 3 wash-days in a 5-day period. Each wash-day shall be separated by a 24-hour period. During a wash-day, the system shall be loaded at times and capacities similar to those delivered during design loading (see 8.2.2.1). However, during the first two dosing periods per day, the design loading shall include 3 wash loads (3 wash cycles and 6 rinse cycles).

Working-parent stress

For five consecutive days, the system shall be subjected to a working-parent stress. During this stress, the system shall be dosed with 40% of its daily hydraulic capacity between 6:00 a. m. and 9:00 a. m. Between 5:00 p. m. and 8:00 p. m., the system shall be dosed with the remaining 60% of its daily hydraulic capacity, which shall include 1 wash load (1 wash cycle and 2 rinse cycles).

Power/equipment failure stress

Power/equipment failure stress simulation shall consist of a flow pattern where approximately 40% of the total daily flow is received between 5 p. m. and 8 p. m. on the day when the power/equipment failure stress is initiated. Power to the system shall then be turned off at 9 p. m. and the flow pattern shall be discontinued for 48 hours. After the 48-hour period, power shall be restored, and the system shall receive approximately 60% of the total daily flow over a 3-hour period which shall include 1 wash load (1 wash cycle and 2 rinse cycles).

Vacation stress

Vacation stress simulation shall consist of a flow pattern where approximately 35% of the total daily flow is received between 6 a. m. and 9 a. m. and approximately 25% of the total daily flow is received between 11 a.m. and 2 p. m. on the day that the vacation stress is initiated. The flow pattern shall be discontinued for 8 consecutive days with power continuing to be supplied to the system. Between 5 p. m. and 8 p. m. of the ninth day, the system shall receive 60% of the total daily flow, which shall include 3 wash loads (3 wash cycles and 6 rinse cycles).

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Parameter	Sample type	Sample location		Frequency/week		Total Samples	
		Raw influent	Treated effluent	Raw influent	Treated effluent	Raw influent	Treated effluent
$CBOD_5$	24-h composite	–	X		3		70
total suspended solids	24-h composite	X	X	3	3	78	70
pH	Grab	X	X	3	3	78	70
temperature (°C)	Grab	X	–	3		78	
E. coli	Grab	X	X	3	3	78	70
turbidity	24-h composite	X	X	3	3	78	70
disinfectant[1]	Grab or 24-h composite	–	X		3		70
TKN	24-h composite	X	–	3		78	
NO2/NO3	24-h composite	X	–	3		78	
total phosphorous	24-h composite	X	–	1		26	
COD	24-h composite	X	–	1		26	
total coliforms	Grab	X	–	1		26	

[1] If the treatment system introduces a disinfectant; the disinfectant shall be measured in the effluent sample. The sample type shall be 24-h composite except when the disinfectant is not stable for 24-h, in which case grab samples shall be

Influent residential wastewater samples shall be collected three times per week, except for the following (which shall be collected one time per week): total phosphorous; COD; total coliforms.

Effluent samples shall be collected three times per week during design loading periods and three times during each stress recovery periods.

Influent samples shall be collected on the same day as effluent samples during each stress recovery period.

Effluent samples shall be collected two times per week during all stress events, except power/equipment failure stress and vacation stress when no samples shall be collected.

Color, odor, oily film and foam on the effluent once every 2 months for a total of three samples over the course of the test.

Measure	Criteria	
	Test Average	Single Sample Maximum
$CBOD_5$, mg/L	10	25
TSS, mg/L	10	30
turbidity, NTU	5	10
E. coli[2], *MPN/100 mL*	14	240
pH, SU	6.0 - 9.0	NA[1]
disinfectant[3], mg/L	≥ 0.5 to ≤ 2.5	NA
color	MR[4]	NA
odor	Nonoffensive	NA
oily film and foam	Nondetectable	Nondetectable
energy consumption	MR	NA

[1]NA: Not Applicable

[2]Calculated as geometric mean

[3]If Chlorine disinfection is used with a storage vessel, systems containing storage of treated restricted reuse water shall provide adequate disinfection. In the case of chlorine, the average total residual chlorine concentration of all effluent samples shall be ≥ 0.5 mg/L and ≤ 2.5 mg/L. Other disinfection procedures shall provide adequate disinfection to prevent microorganism growth in the treated reuse water storage while avoiding degradation of plumbing components and fixtures exposed to the treated reuse water.

[4]MR: Measured and reported only.