Appendix A: Wastewater Math

Common Equivalents Used to Solve Wastewater Math Problems

Linear and Area Measurement
2.54 centimeters per inch
39.37 inches per meter
5,280 feet per mile
1.61 kilometers per mile
144 square inches per square foot
43,560 square feet per acre

Volume
7.481 gallons per cubic foot
27 cubic feet per cubic yard
3.785 liters per gallon
1000 milliliters per liter
43,560 cubic feet per acre-foot

Weight
16 ounces per pound
453.6 grams per pound
1000 grams per kilogram
2.2 kilograms per pound
7000 grains per pound

Density and Pressure
Water weighs 8.34 pounds per gallon (at 60º F)
1 liter of water weighs 1 kilogram (at 60º F)
The specific gravity of water is 1.0000 (at 60º F)
2.31 Feet of water generates 1.0 pound per square inch of pressure
1.0 Foot of water generates 0.433 pounds per square inch of pressure

Time
60 seconds per minute
60 minutes per hour
24 hours per day
1440 minutes per day
30 days per month (average)

Flow
448.8 gallons per minute per 1 cubic foot per second
646,300 gallons per day per 1 cubic foot per second
694.4 gallons per minute per 1 MGD
1.545 cubic feet per second per 1 MGD
1,000,000 gallons per day per 1 MGD
0.646 MGD per 1 cubic foot per second

Dosage
1 milligram per liter per 1 part per million
17.1 parts per million per 1 grain per gallon
8.34 pounds of solids in 1,000,000 gallons of water per 1 part per million

Power
550 foot pounds per second per 1 horsepower
33,000 foot pounds per minute per 1 horsepower
746 watts per 1 horsepower
1.34 horsepower per 1 kilowatt

Typical Values for Wastewater Systems
0.2 pounds of Total Suspended Solids per person per day
0.17 pounds of Biochemical Oxygen Demand per person per day
100 gallons of sewage per person per day
3.5 people per residence