5.6.3 Treatment Alternative 3

The third treatment alternative is referred to as the organic mass removal rate alternative. Two values must be calculated to determine if the criteria of this treatment alternative have been met.

The first term, the required organic mass removal rate (RMR) is based on each of the hazardous waste streams which, when measured at the point of waste origination, have an average VO concentration equal to or greater than 500 ppmw. The determination of RMR requires using the average volumetric flow rate and the density of these less than 500 ppmw wastes

as determined at their point of waste origination, points A and B in Figure 3 below. The volatile organic concentration, the volumetric flow rate and the waste density are used to calculate the RMR using the following equation:

$$RMR = \sum_{x=1}^{n} [V_y \times k_y \times \frac{C_{ave_y} - 500 \ ppmw}{10^6}]$$

(Equation 5-8)

where: RMR = Required organic mass removal rate, kg/hr
y = Individual waste stream "y" with a C_{ave} equal to or greater than 500 ppmw
n = Total number of "y" waste streams
V_y = Average volumetric flow rate of waste stream "y", m_3/hr
k_y = Density of hazardous waste stream "y", kg/m_3
$Cave_y$ = Average volatile organic concentration for hazardous waste stream "y" at the point of waste origination, ppmw

The second term required for this treatment alternative is the organic mass removal rate (MR). MR is the calculated difference between the organic mass flow entering and exiting the treatment unit, points C and D in Figure 3 below. The organic mass removal rate is also represented by the following equation:

$$MR = E_b - E_a$$

(Equation 5-9)

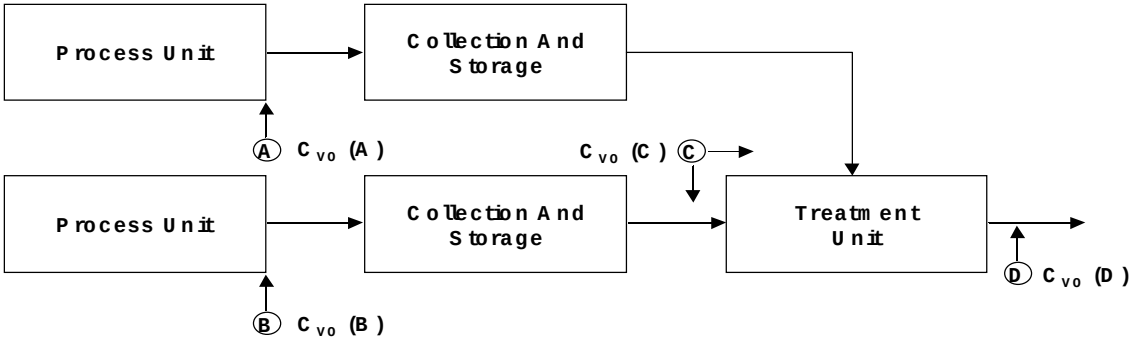
where:

$$E_a = \frac{1}{10^6} \sum (Q_{aj} \ x \ C_{vo, aj})$$

(Equation 5-5)

$$E_b = \frac{1}{10^6} \sum (Q_{bj} \ x \ C_{vo, bj})$$

(Equation 5-6)



A = Point of waste origination
B = Point of waste origination
C = Point where waste enters process, mass entering calculated at this point
D = Exit point, mass exiting calculated at this point

MR = Mass (in) – Mass (out)

[MR > RMR]

Treatment Alternative 3

Advantages of the organic mass removal rate treatment alternative include that it does not require a 95 percent VO reduction for every influent waste stream, the required organic mass removal rate is not waste stream specific but is based on the aggregated volatile organic mass of the untreated waste entering the treatment process, and it limits the number of waste determinations because it is based on mass rather than concentration.