

7. CONCLUSIONS

Potentially toxic organic compounds (PTOCs) have been observed in the influent of MWTPs in California. With the exception of trihalo-methanes, concentrations of PTOCs have been generally observed to decrease in passing from the influent to the effluent of the plant. A review of the literature has shown that the following processes are significant in removing volatile PTOCs from wastewater: volatilization, adsorption to solid particles and biomass, and biodegradation. For volatile PTOCs the literature, expert opinion, and limited data favor removal from wastewater primarily by volatilization with a lesser amount being degraded or removed with sludge. This conclusion was largely based on the following observations:

- 1) Biodegradation of PTOCs is known to be slow for unacclimated systems. Based upon the data collected for this study, acclimation of organisms was unlikely at the levels of PTOC concentrations typically observed in influents to MWTPs in California.
- 2) Volatile PTOCs have a low affinity for adsorption. The two PTOCs with the highest Henry's law constants, carbon tetrachloride and vinyl chloride, were observed to be the PTOCs that were the most efficiently removed in MWTPs.
- 3) An analysis of raw data obtained from previous studies indicated that adsorption to sludge accounts for only a small fraction (<10%) of the total removal of PTOCs during wastewater treatment. Furthermore, sludge treatment processes such as dissolved air flotation and sludge drying are conducive to volatile emissions of PTOCs. It was estimated that 0.8 million tons/year (tpy) of sludge were produced in California, and that 82 tpy of PTOCs were removed in sludge streams. The most common sludge disposal practice was landfilling, from which volatile emissions of PTOCs was also possible.

For those reasons, a conservative estimate of PTOC loss by volatilization was carried out by assuming that all removal of PTOCs in a MWTP would occur by volatilization.