**The Hawaii Nitrogen Removal Program**

The Hawaii Department of Health manages the NPDES surface water discharge, deep well injection and reuse discharge programs. The Hawaii Department of Health in November 15, 2014 established water quality standards for inland and coastal waters with limits for total nitrogen and nitrite/nitrate nitrogen.

Most point source dischargers in Hawaii discharge through deep ocean outfalls, injection wells, or reuse. There are only two significant inland stream/lake dischargers. Injection well discharges are regulated by underground injection control permits rather than NPDES permits.

For ocean outfalls, dischargers need to monitor for and meet receiving water nutrient limits of the water quality standards. The limits for estuary and ocean dischargers are established at the boundary of each discharger’s zone of influence. The limits for the boundary water quality limit are very low and range from 0.050 – 0.30 mg/l for total nitrogen and 0.0035-0.070 mg/l for nitrite/nitrate nitrogen.

Each discharger needs to establish a mixing zone so that end of pipe permit limits can be established. Effluent limits are typically back-calculated based on evaluation of dilution factors, zone of mixing and water quality limits.  If a mixing zone is not established the low total/nitrogen and nitrite/nitrate nitrogen limits in the water quality standard will apply.

The Hawaii Department of Health indicated that no changes are planned for the state water quality standards but that the trend is moving toward establishing effluent limits for the discharges. They are in the process of developing revised effluent limits and methods of determining compliance. The state will likely incorporate the use of geometric means, not-to-exceed ten percentile limits, and maximum single sample limits. When violations occur, they will likely require more intensive additional follow-up sampling.

Presently there are 8 municipal NPDES major greater than one million gallon per day permitted flow, 6 military facility wastewater treatment plants, 4 electric power generating plants and one petroleum facility that have total nitrogen and nitrate nitrogen monitoring in discharge permits. There is one major discharger, the NAVFAC naval facility at Pearl Harbor that has a total nitrogen permit limit of 16 mg/l.

No major facilities in Hawaii currently are using methanol or other supplemental carbon sources for denitrification. Given the potential for very low future total nitrogen and nitrate nitrogen limits it is likely that a supplemental carbon source will be needed to achieve the current limit of technology nitrogen limit.