

NUTRIENT LOADING AND MICROBIAL INDICATORS OF FECAL
CONTAMINATION IN THE SURFACE WATERS OF LAIE POINT, OAHU

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ABSTRACT

Cesspool usage on Laie Point, Oahu may be introducing excessive nutrient contaminants and harmful pathogens into nearby marine waters. The purpose of this study was to investigate the occurrence of excessive nutrient loading as well as the occurrence of microbial indicators of fecal contamination in the surface waters around Laie Point, and to assess the risk of contamination due to the use of on-site sewage disposal systems. Water samples were collected under State of Hawaii Department of Health (DOH) standards at various time intervals, under differing environmental conditions, and were analyzed for NH_3^+ , NO_3^- , total N and total P, as well as for the fecal indicator organisms enterococci and *Clostridium perfringens*. This assessment has demonstrated excessive nutrient loading and the presence of fecal indicators above the State of Hawaii DOH standards on a number of occasions, consistent with wastewater effluent. Positive correlations, within the 95% confidence range, found between enterococci and NO_3^- (0.93) and total N (0.85) suggest that surface waters receive both, nutrient and pathogenic contamination, simultaneously. There is also evidence of an inverse correlation between fecal indicators and salinity (correlation coefficient of -0.81 for enterococci and -0.83 for *Clostridium perfringens*, 95% confidence level); thus, indicating the possibility that the freshwater in the Laie Point cesspools is directly contributing to a nutrient and pathogenic load to the surface waters. This contamination is potentially harmful to the environment and could present health risks to persons in contact with contaminated waters.