

Perchlorate Remediation Using a Novel Autotrophic Perchlorate-Reducing Microbial Community

PIs: Sarina J. Ergas and Klaus Nüsslein

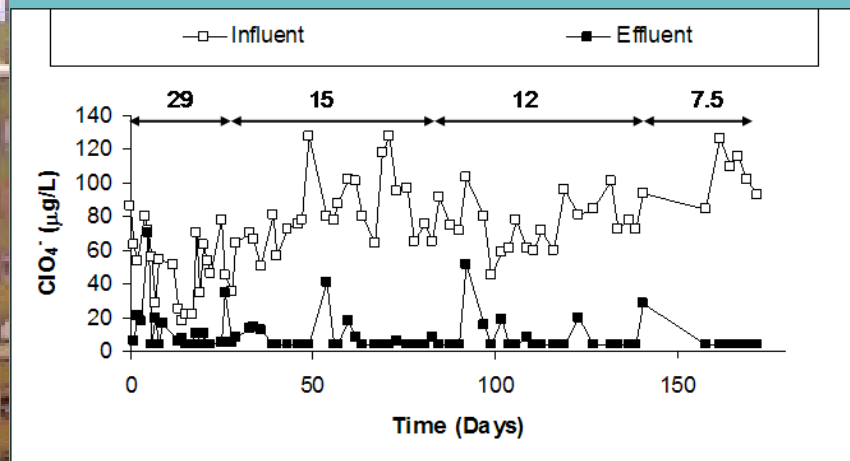
Sponsor: National Science Foundation

Students: Ashish Sahu, Teresa Conneely, Amber Boles and Robert McKeever

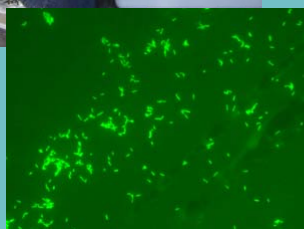
Synopsis: Perchlorate is a common groundwater contaminant that interferes with thyroid function. Drs. Ergas and Nüsslein are investigating a novel autotrophic microbial consortium that can use elemental sulfur as an electron donor and perchlorate as an electron acceptor. In bench-scale studies ClO_4^- concentrations (60-120 mg/L), typical of contaminated groundwater sites, were reduced to < 4 mg/L at an EBCT of 7.5 hours. The microbial community was found to change with ClO_4^- availability from a majority of Beta-Proteobacteria near the influent end of the reactor to primarily sulfur-oxidizing bacteria near the effluent end of the reactor. Current research focuses on pilot-scale studies at the Massachusetts Military Reservation on Cape Cod



Teresa with pilot reactor.



Perchlorate removal in a bench-scale bioreactor.



FISH images of ClO_4^- reducing bacteria.

