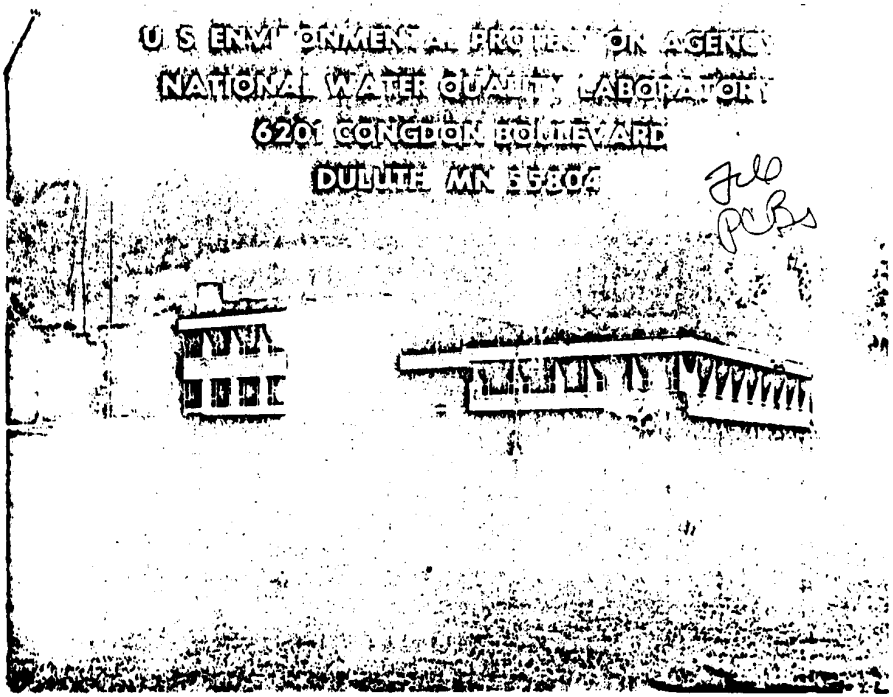



# QUARTERLY RESEARCH REPORT

March 31, 1973

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This report does not constitute publication but is for information only. All data must be considered provisional.

ASSOCIATE LABORATORY OF
NERC-Corvallis, OR

Office of Research & Monitoring

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The acute toxicity tests with bluegills are being conducted, and those with fathead minnows will be underway soon. The systems are being built for the chronic tests with brook trout and fathead minnows. The methods for measuring the toxicants in the chronic tests are being developed.

H. ROAP - 16AAO - Complex Effluent Criteria.

No progress to report.

I. ROAP - 16AAP - Biomonitoring of Experimental Sewage Treatment Effluents. Grant R800700 - Effects of Chlorinated Power Plant Condenser Cooling Water on Rainbow Trout and Fathead Minnows. Bureau of Water Management, Michigan Department Natural Resources, Lansing, Michigan. Principal Investigator, James G. Truchan. Project Officer, John W. Arthur. Field studies have now been conducted and results summarized from six different power plants. Results indicate that the toxicity from these intermittent discharges of chlorine is related to test exposure time, proportion of free chlorine found in the residual chlorine concentrations, and organic matter content of the cooling plant waters. Chlorine concentrations lethal to 50% of the trout in 30 and 60 minutes at two of the power plants ranged from 0.19 to 0.31 and 0.09 to 0.15 mg/l, respectively. The nonsalmonid species tested were less sensitive to the chlorine exposures.

Grant R800675 (18050 HIK) - Chlorination and Ozonation Products of Municipal Sewage. University of Minnesota, Duluth, Minnesota. Principal Investigator, R. M. Carlson. Project Officer, G. E. Glass. The principal investigator has isolated and identified several chlorine-containing compounds which were formed as a result of treating parent compounds with different chlorine concentrations as a function of pH. Biphenyl, phenols, 2-4-D, and terpenes were all chlorinated to some extent when subjected to the conditions of aqueous disinfection using chlorination. The toxicity of all the mixtures increased with chlorine incorporation, in some cases as much as twenty-fold.

Significant chlorine incorporation was observed with biphenyl at a concentration of three milligrams per liter, pH 2.2 and a chlorine concentration of 1350 milligrams per liter. The biphenyl isomer distribution produced from these conditions has gas chromatographic measurements similar to Aroclor® 1221. These data show that super-chlorination of acidic wastes which contain aromatic compounds will produce significant concentrations of toxic polychlorinated compounds.

This information and future findings from this grant will be used to aid in the assessment of continued use of chlorine as a chemical for disinfection of sewage effluents.

J. ROAP - 16ABI - Temperature and Dissolved Oxygen Requirements for Freshwater Organisms.