

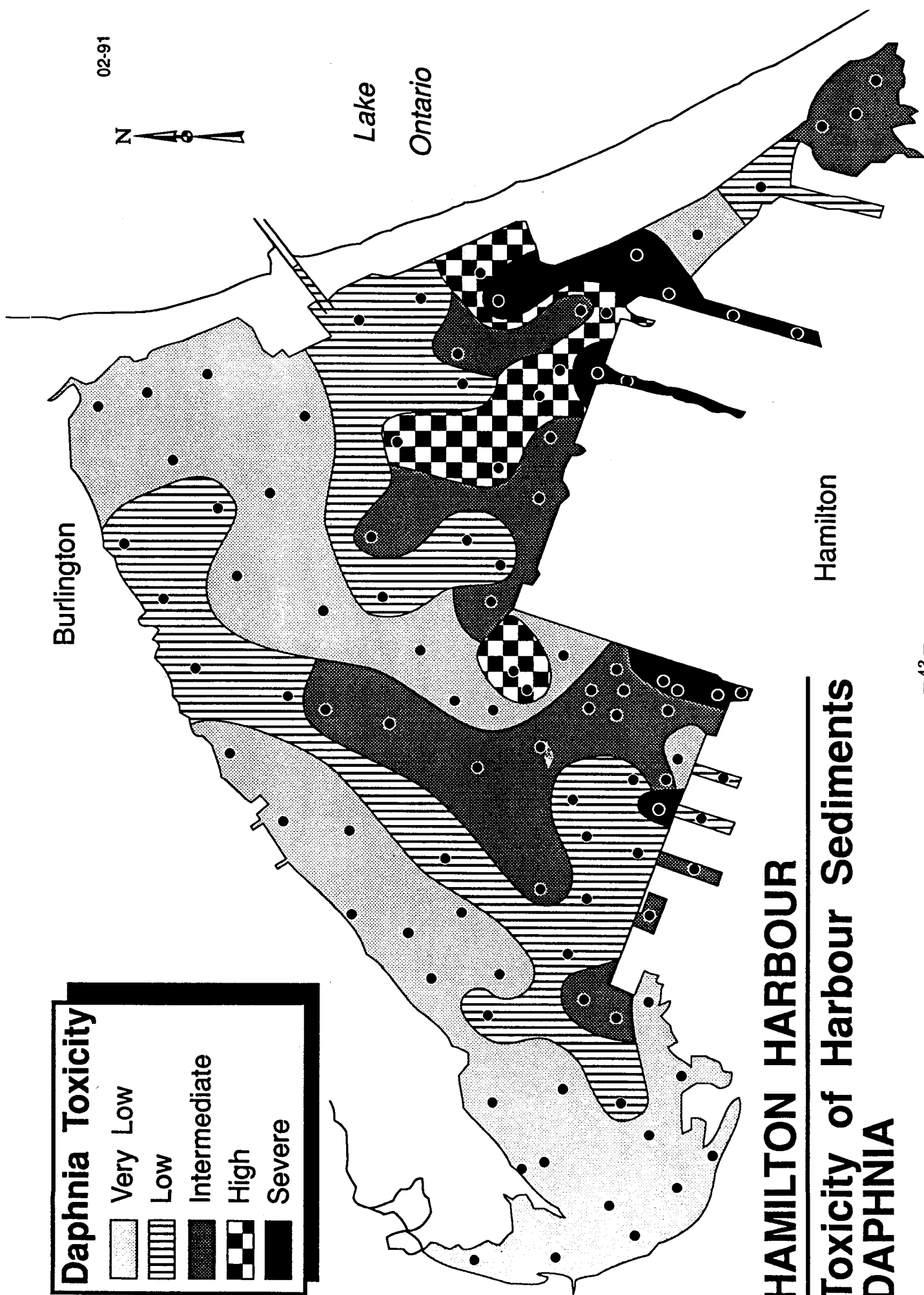
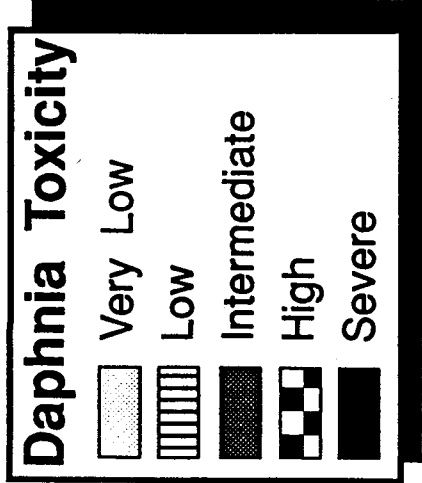
# **In Situ Sediment Remediation Technology: River and Lake Treatment**

**Thomas Murphy**

**National Water Research Institute  
Environment Canada  
Ontario, Canada**

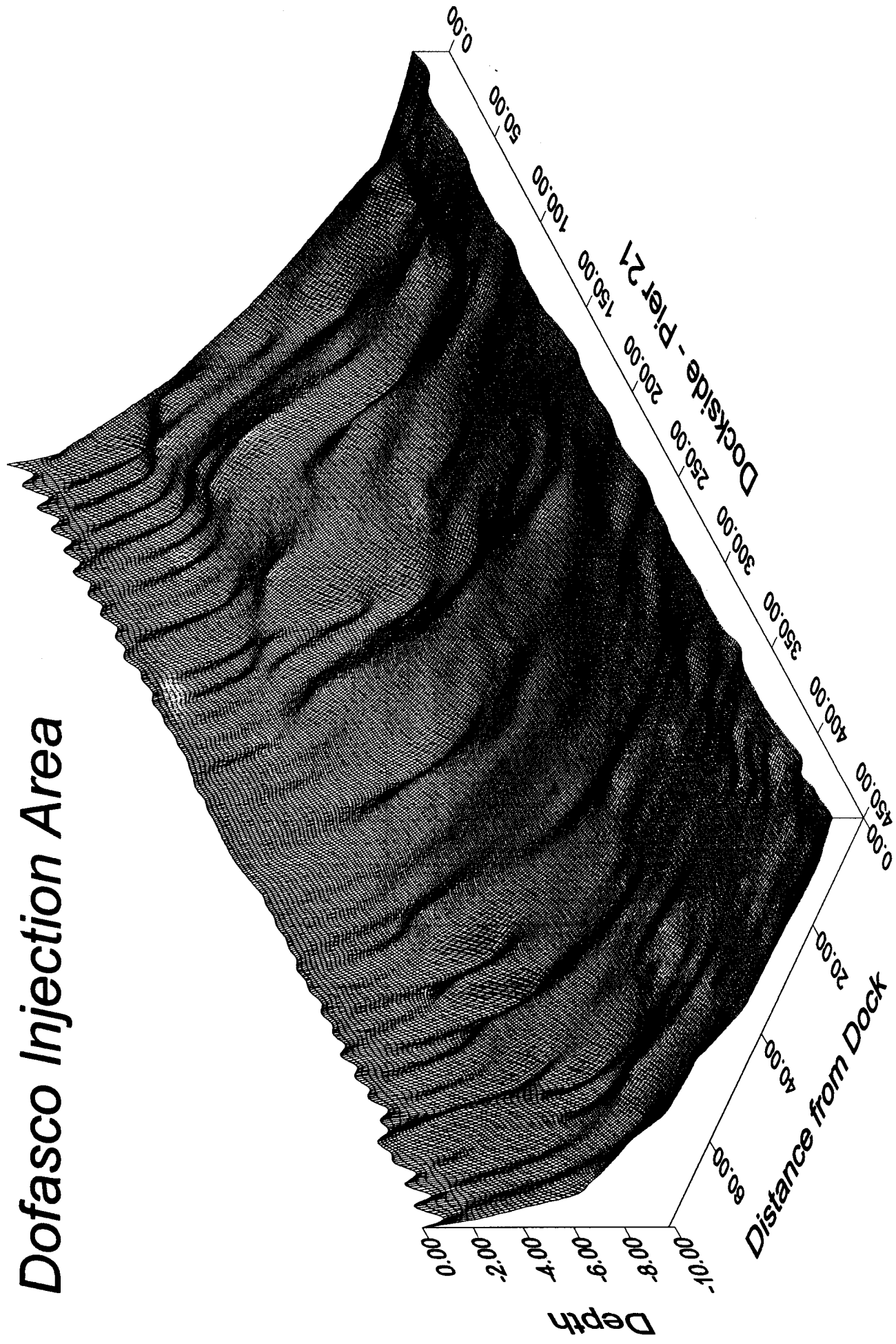
**November 28, 1996  
Seoul, Korea**

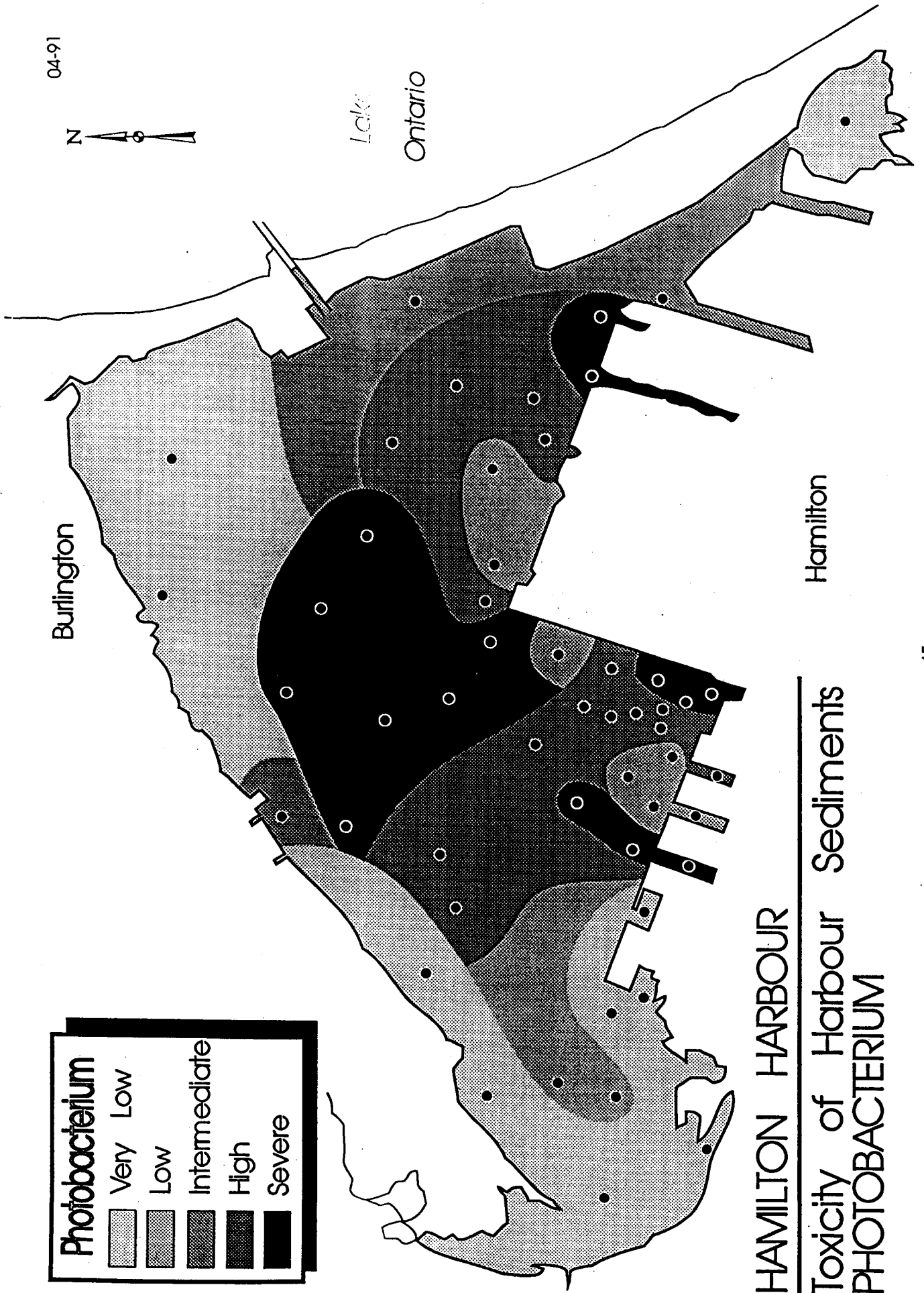
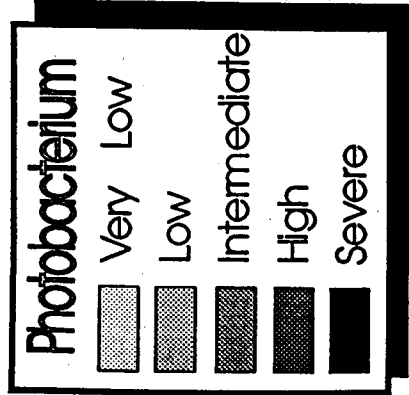




**HAMILTON HARBOUR**  
**Toxicity of Harbour Sediments**  
**DAPHNIA**

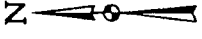
# Dofasco Injection Area





**HAMILTON HARBOUR**  
**Toxicity of Harbour Sediments**  
**PHOTOBACTERIUM**

04-91



Lake Ontario

Burlington

Hamilton

# Solubility in Freshwater\*



10

mg/L



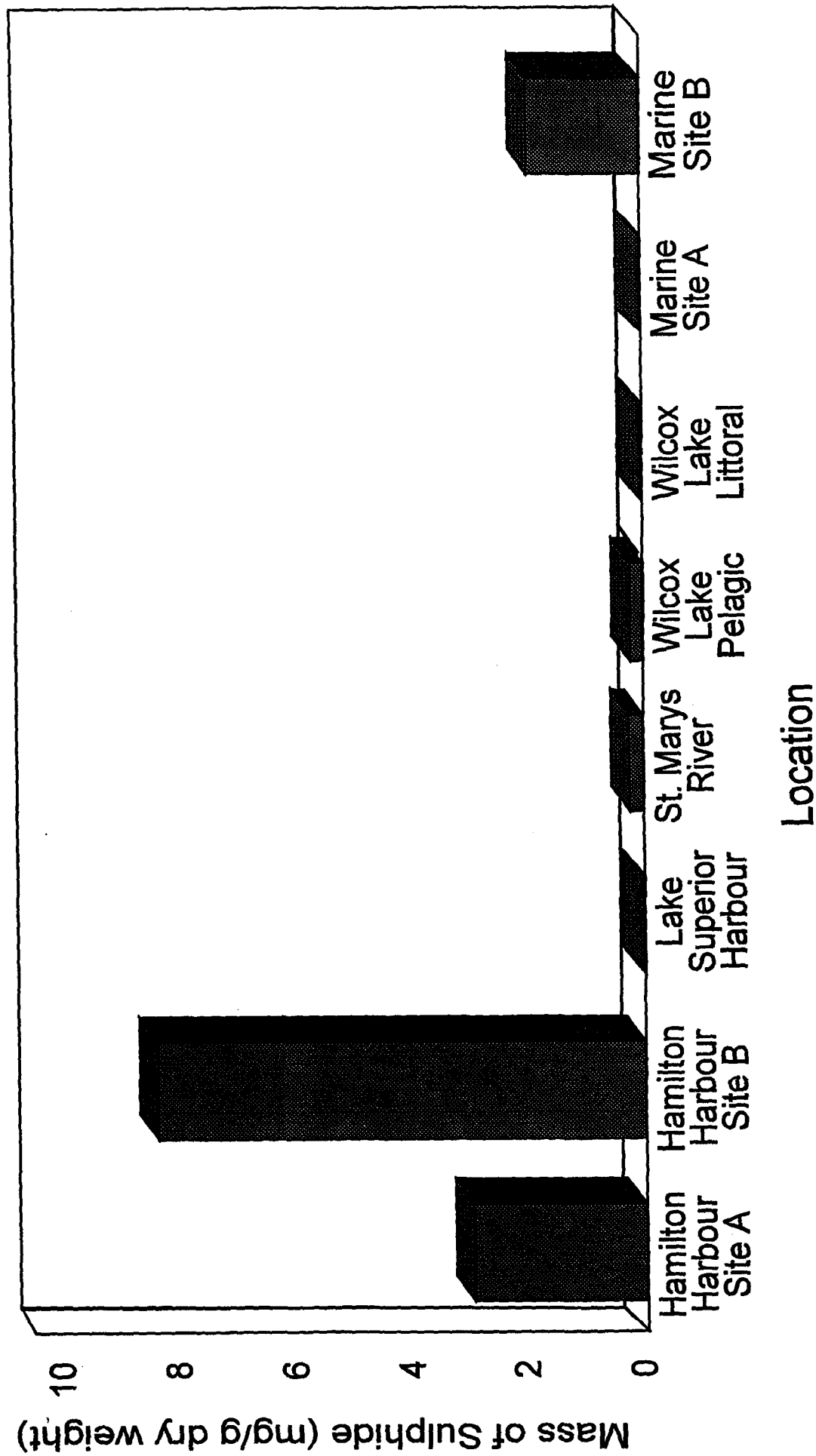
2,660,000

mg/L

\*CRC Handbook

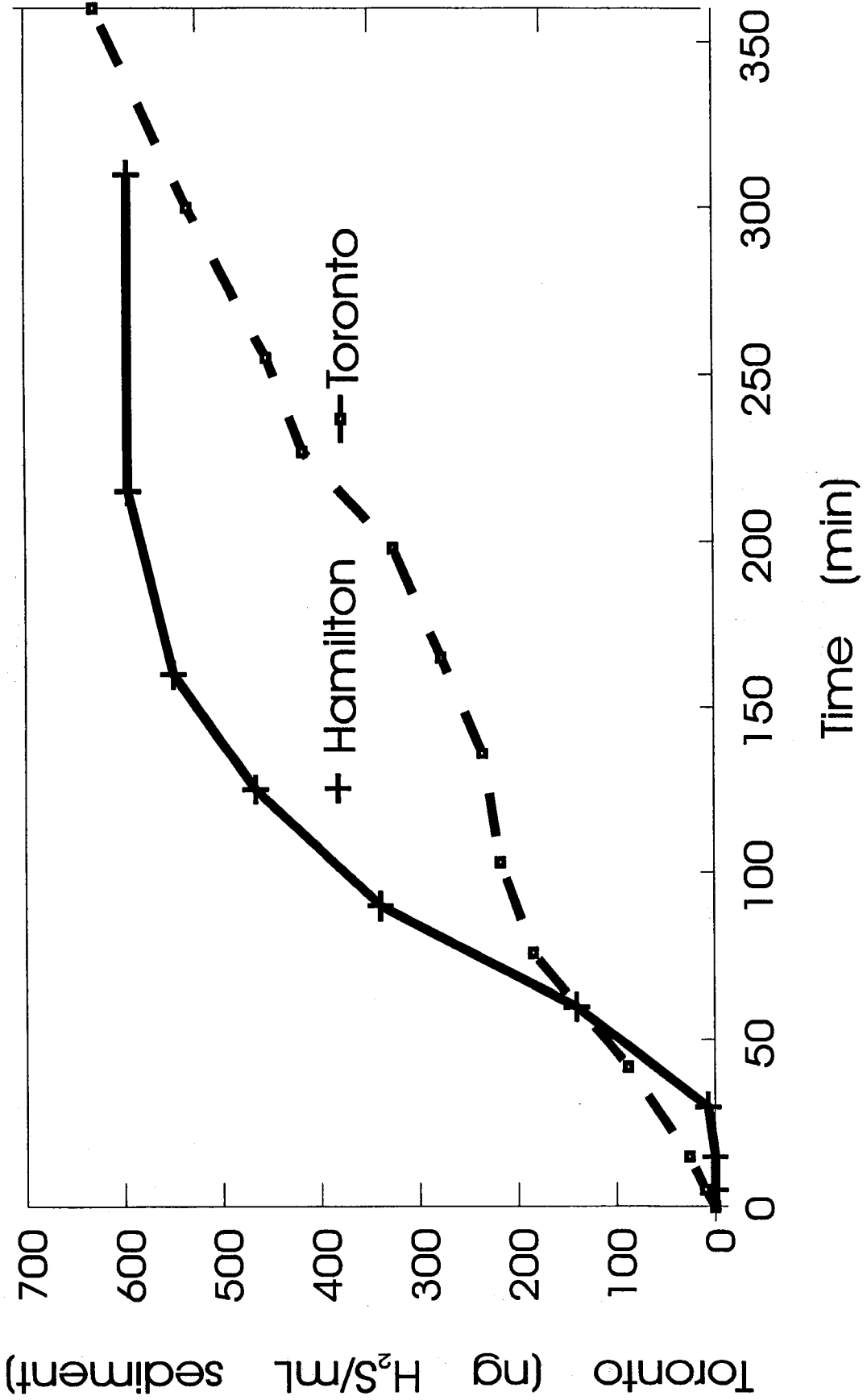
# Acid Volatile Sulphide

## Average Amounts in Sediments



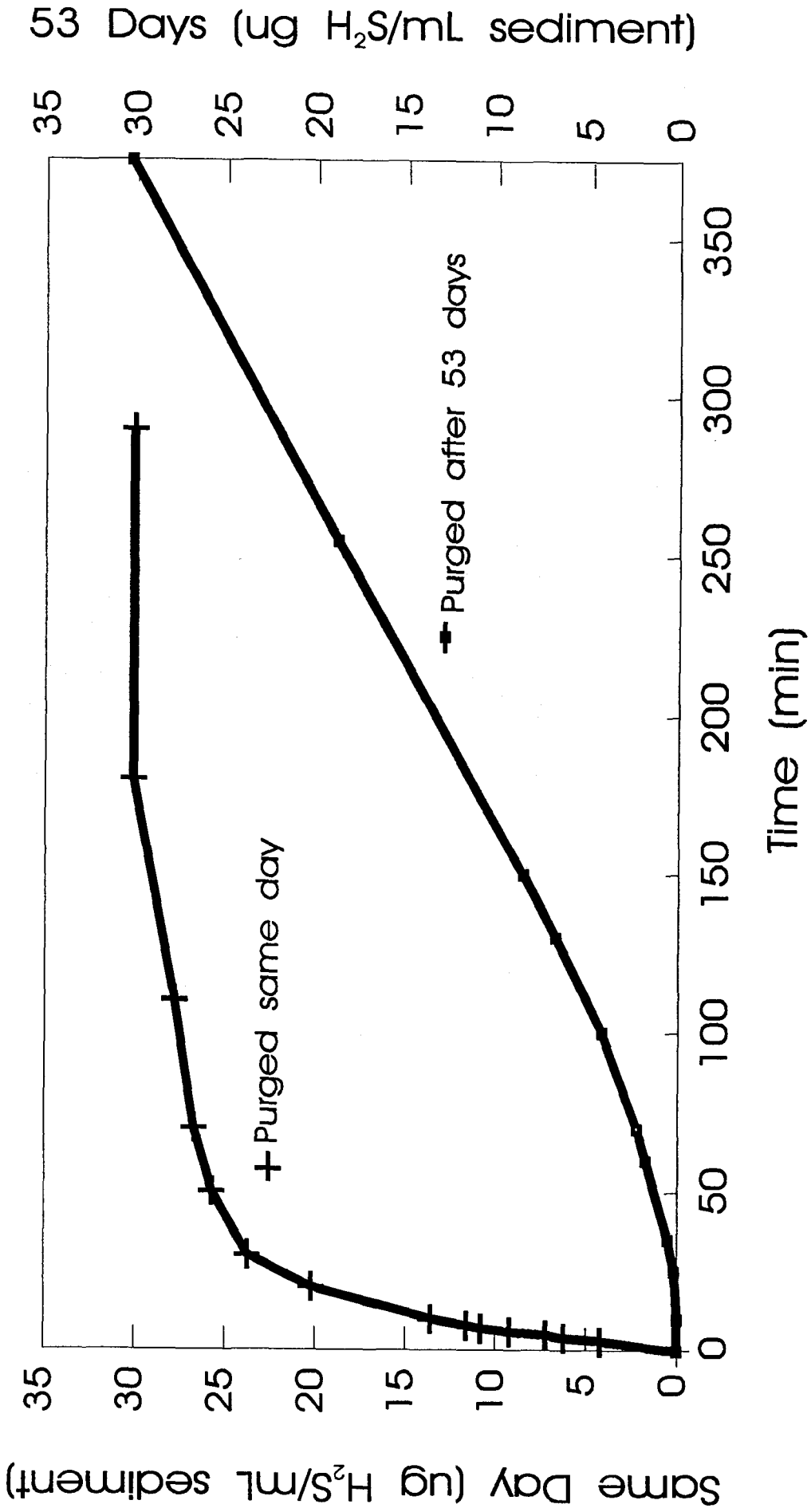
# Purging of Contaminated Sediments

Hamilton (ng H<sub>2</sub>S/mL sediment)

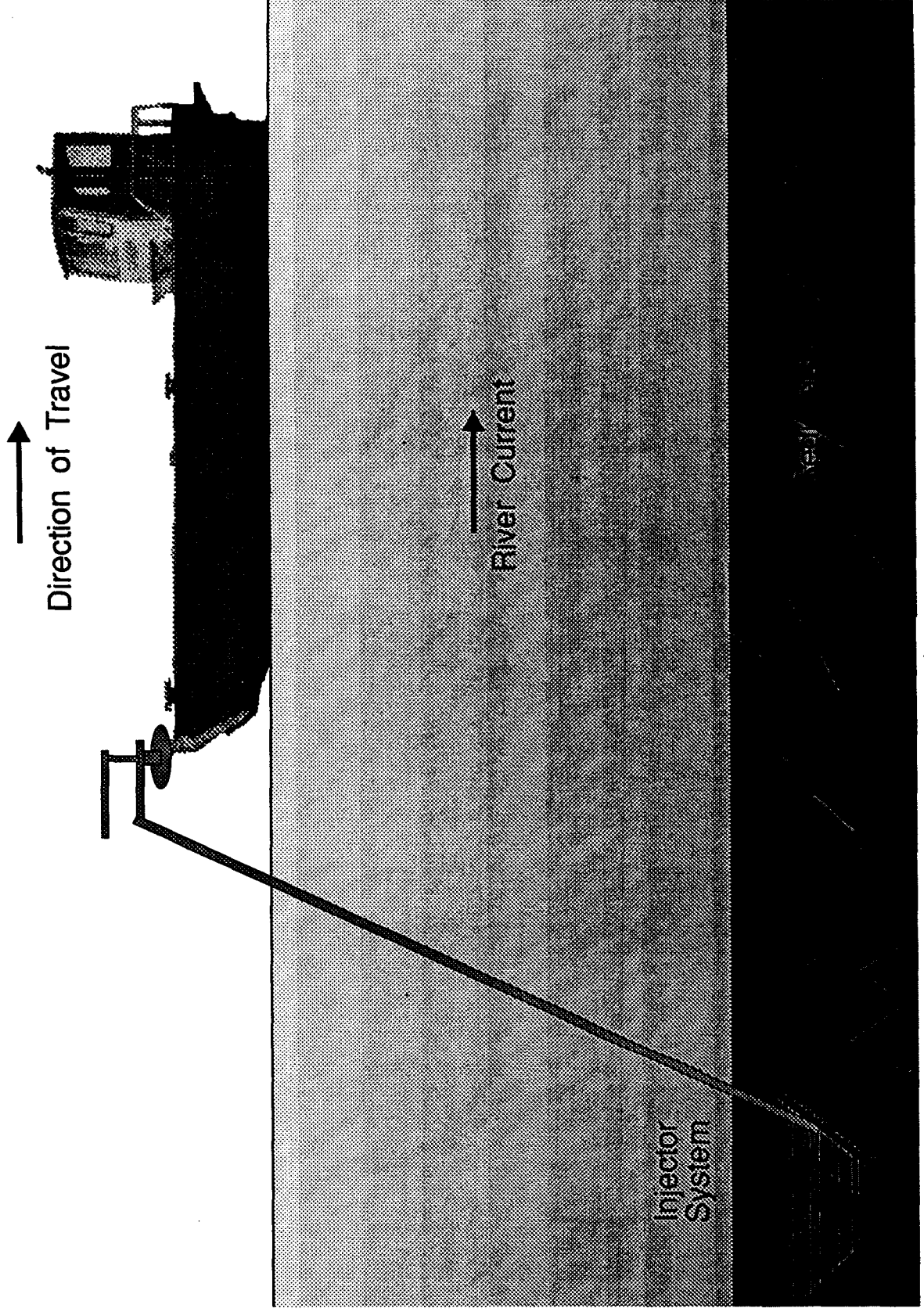




# Purging of Spiked Long Point Sediment

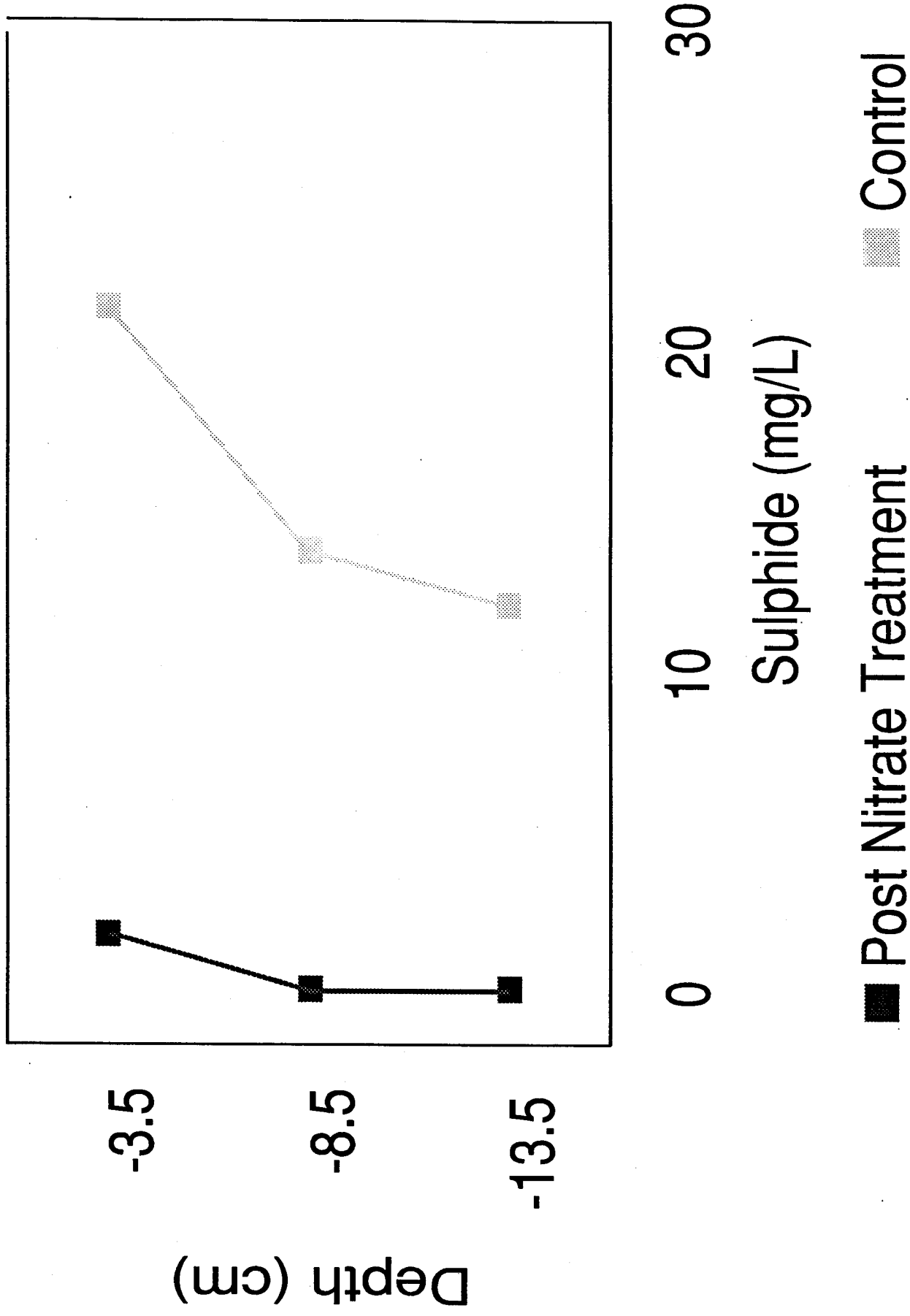


# SYSTEM FOR INJECTING CHEMICALS INTO SEDIMENTS



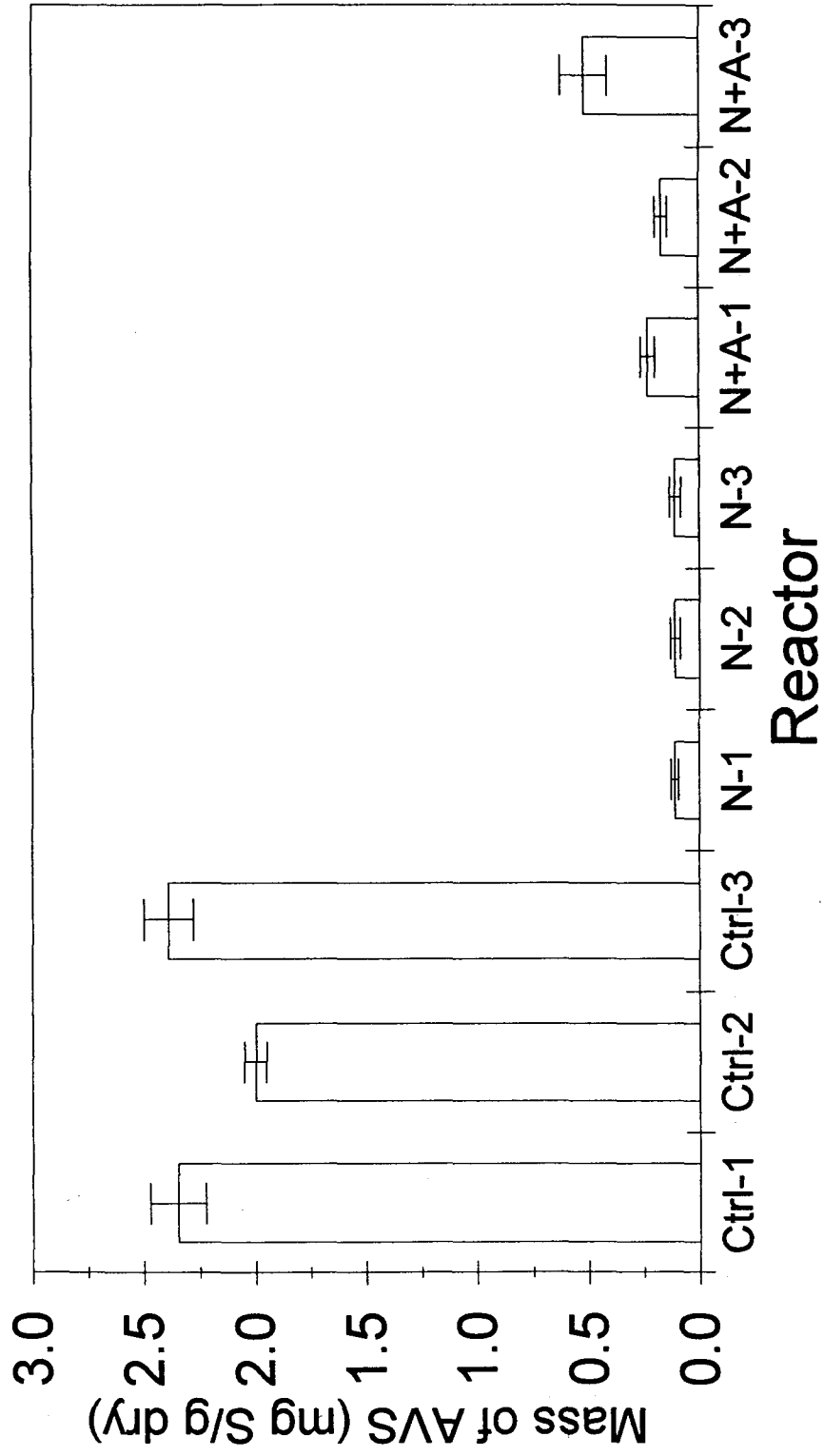
# St. Marys River

## Heat Volatile Sulphide



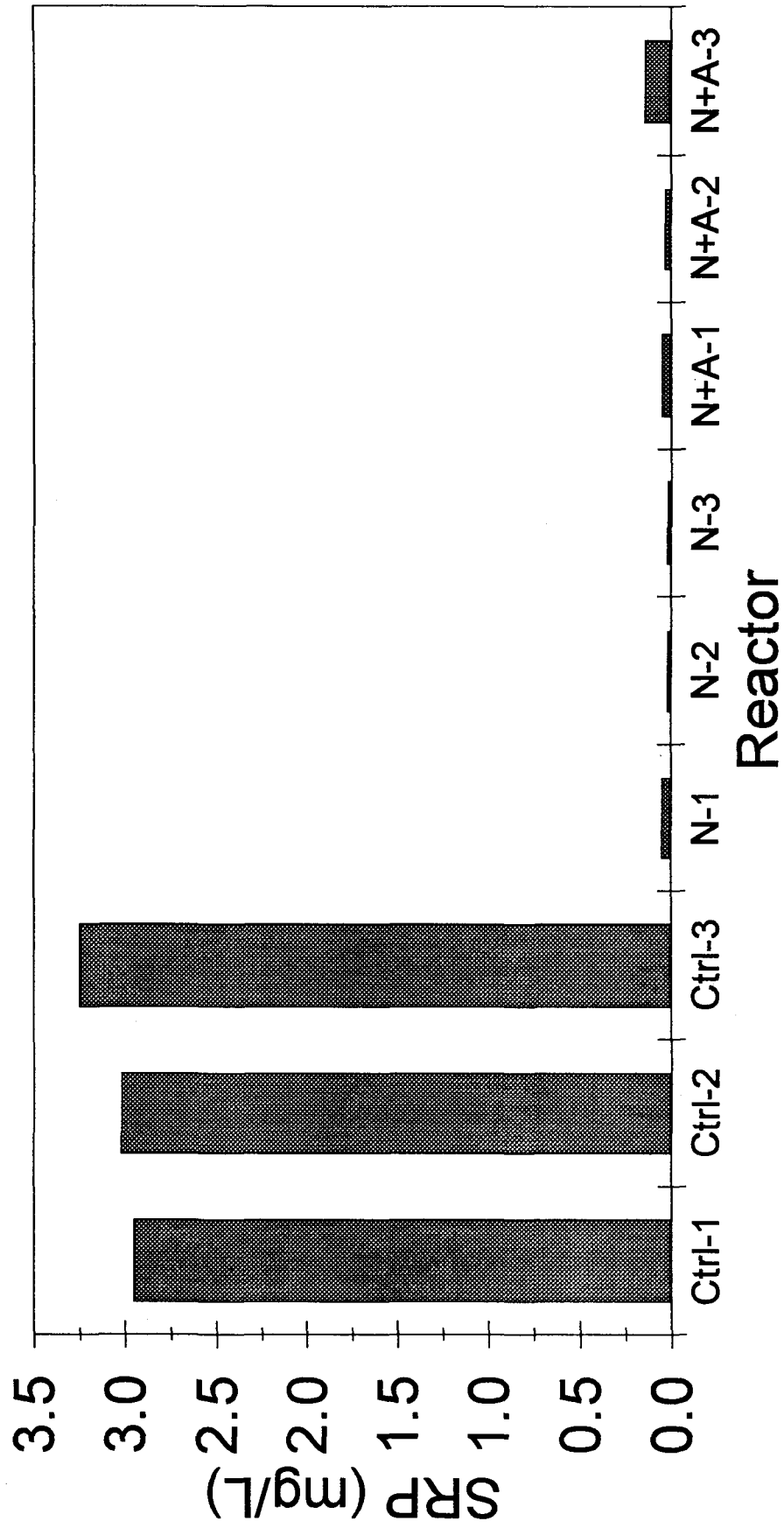
# Acid Volatile Sulphide

Marine Site B Reactors



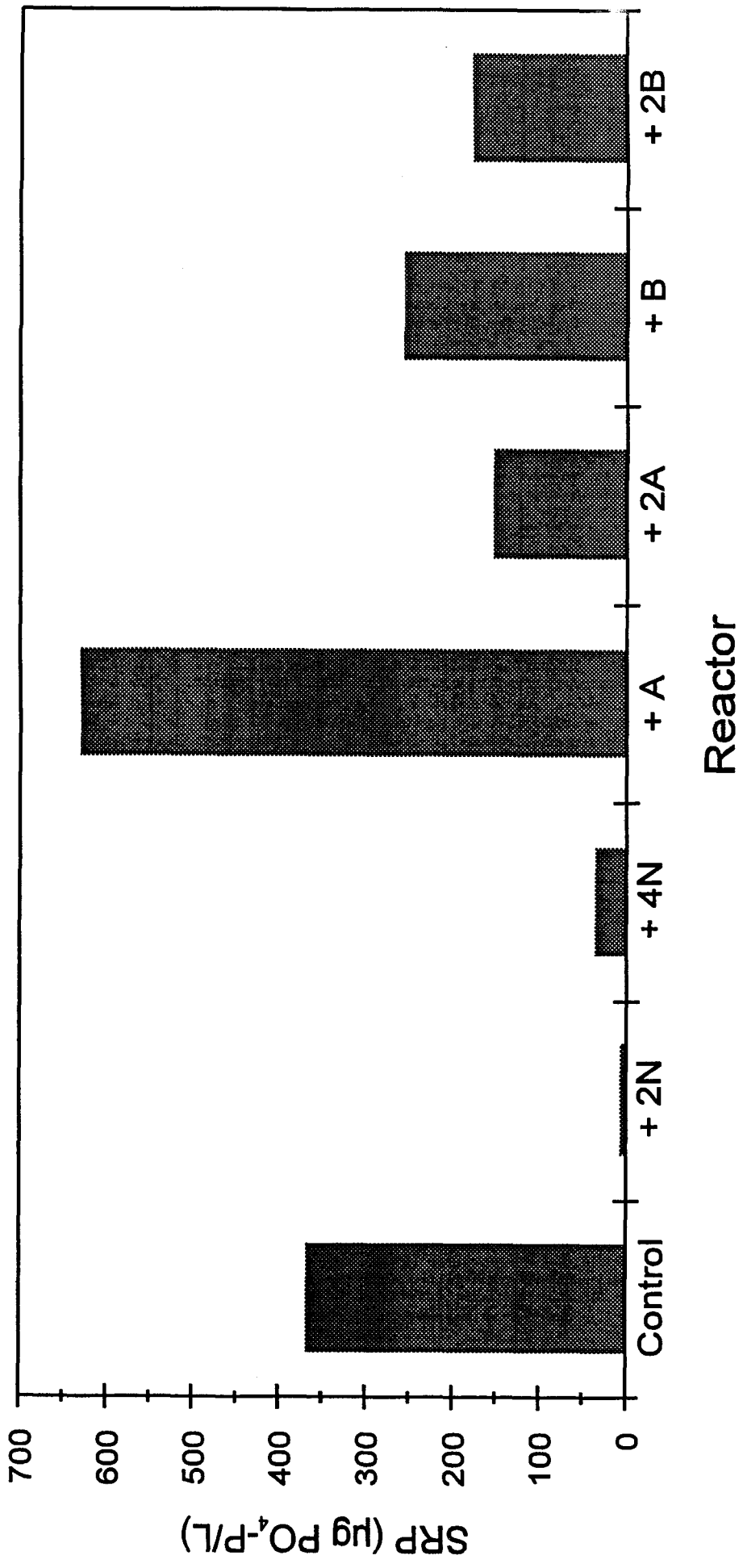
# Soluble Reactive Phosphorus

Marine Site B Reactors 1994



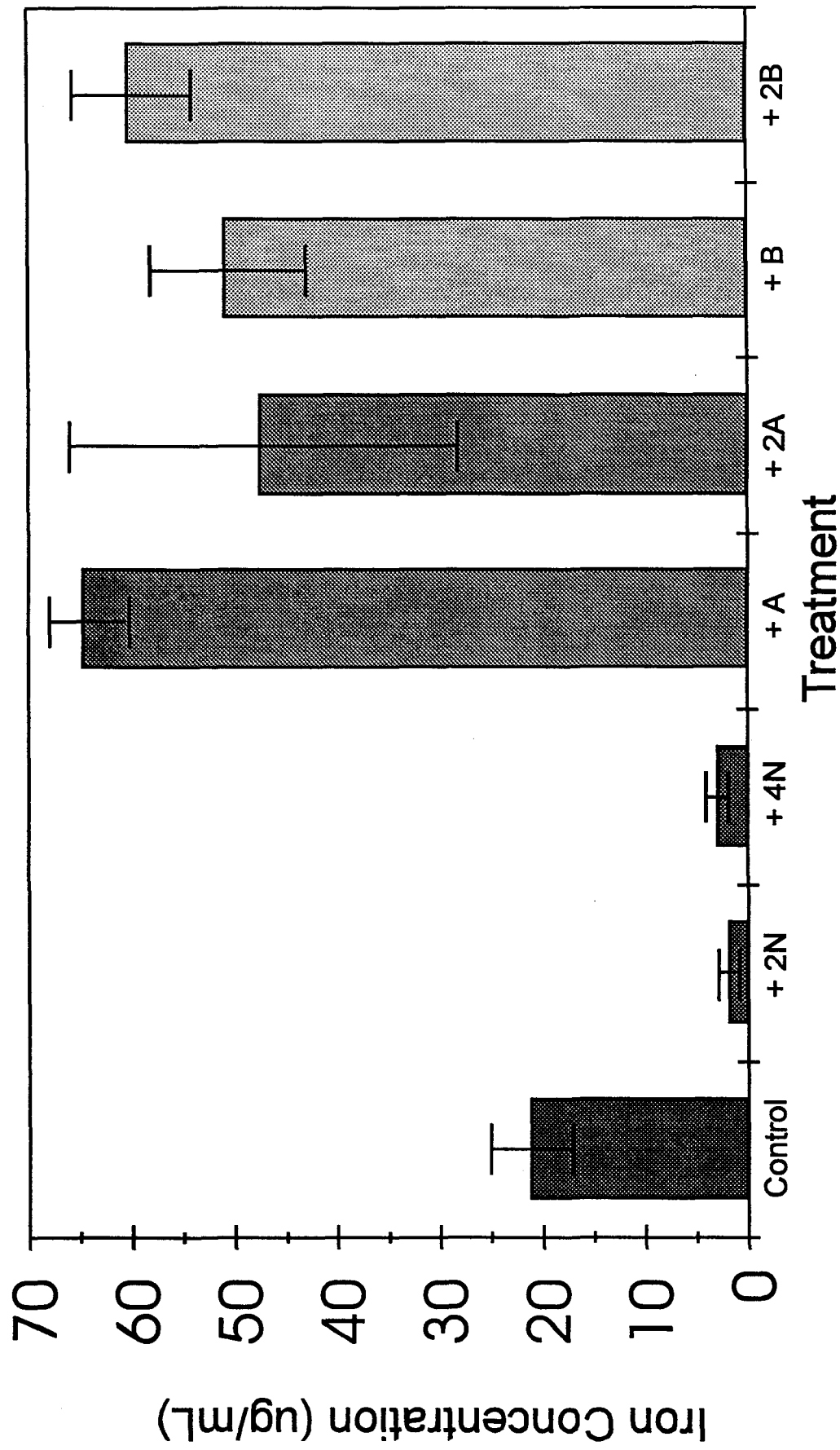
# SRP in Pore Water

## Akanoi Bay Reactors, June 9-July 7/95



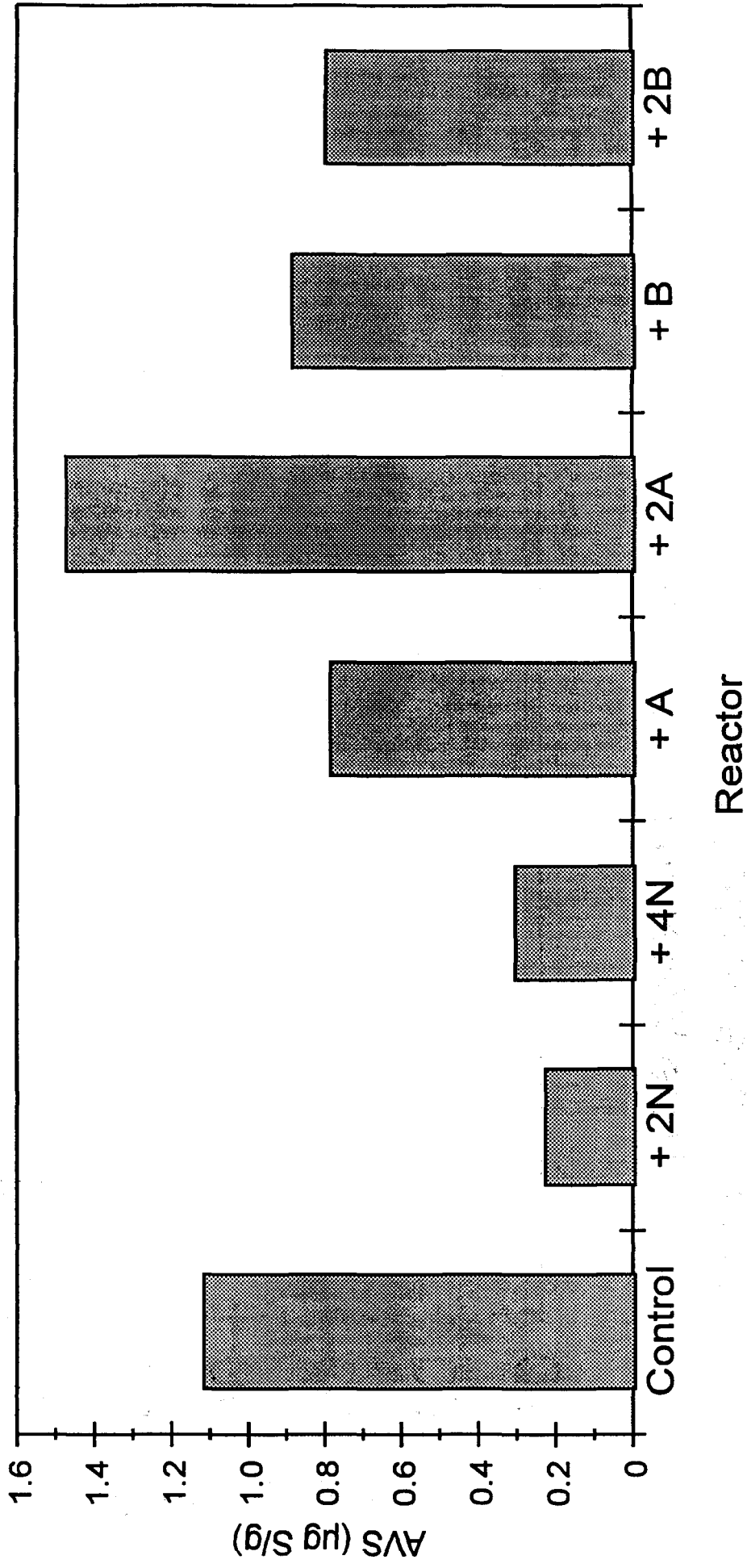
# Lake Biwa Microcosm Iron Concentrations

## Pore Water Analysis June 9-July 7/95



# Acid Volatile Sulphide in Sediment

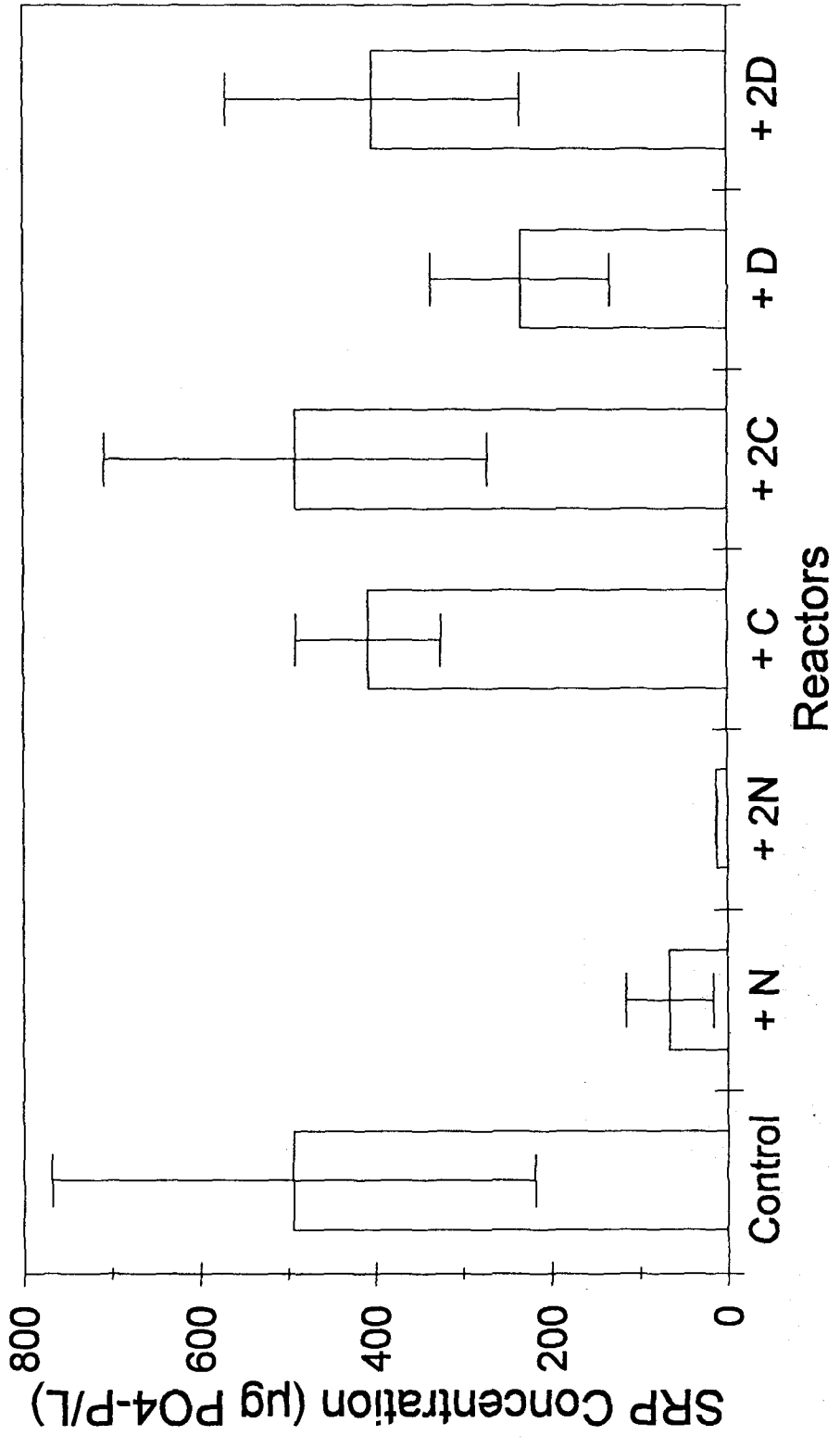
Akanoi Bay Reactors, June 9-July 7/95





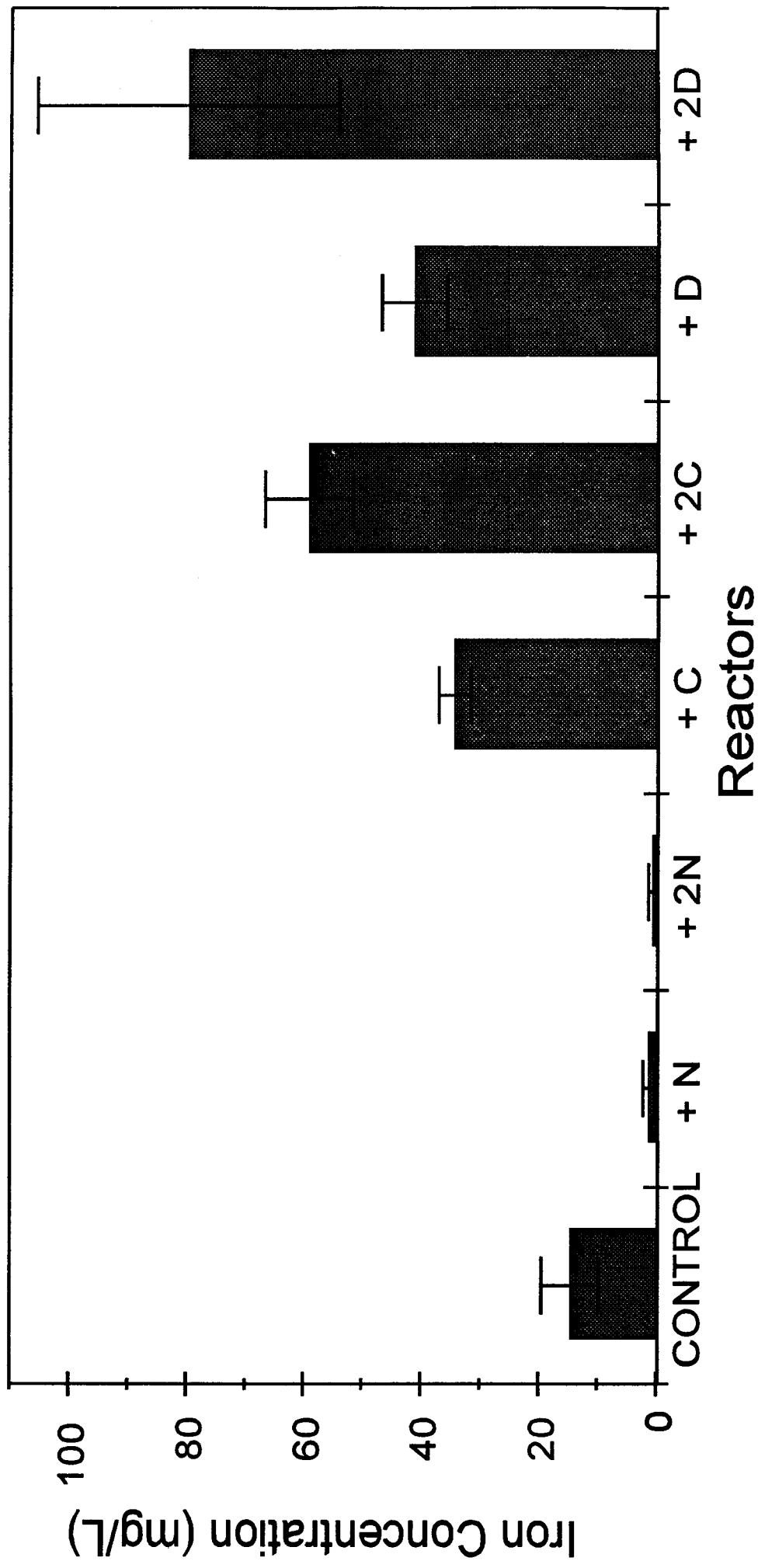
# SRP in Pore Water

Akanoi Reactors: Aug. 29-Sept. 29/95



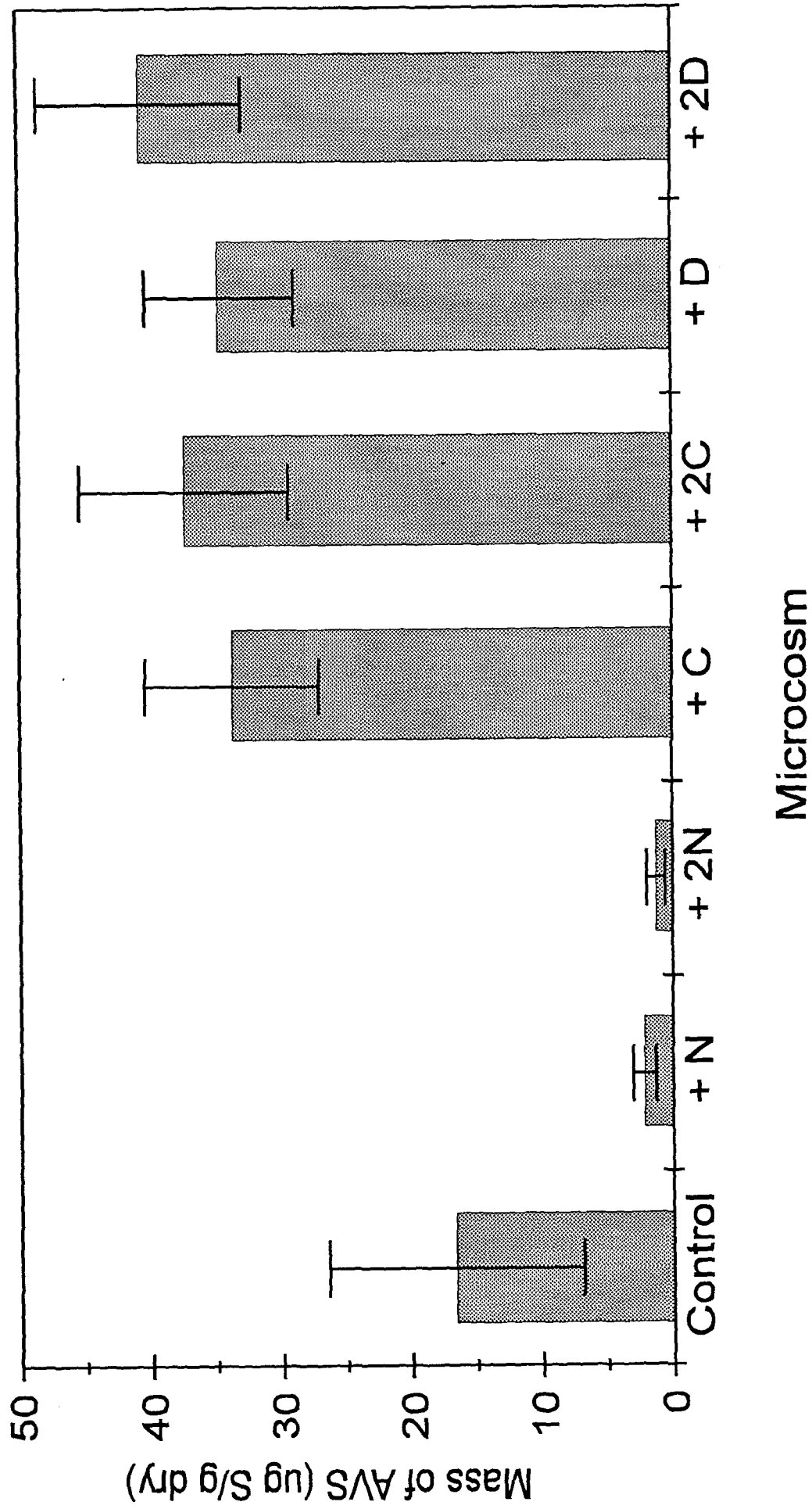
# Iron Concentrations in Pore Water

Akanoi Microcosms; Aug 29 - Sept 29/95



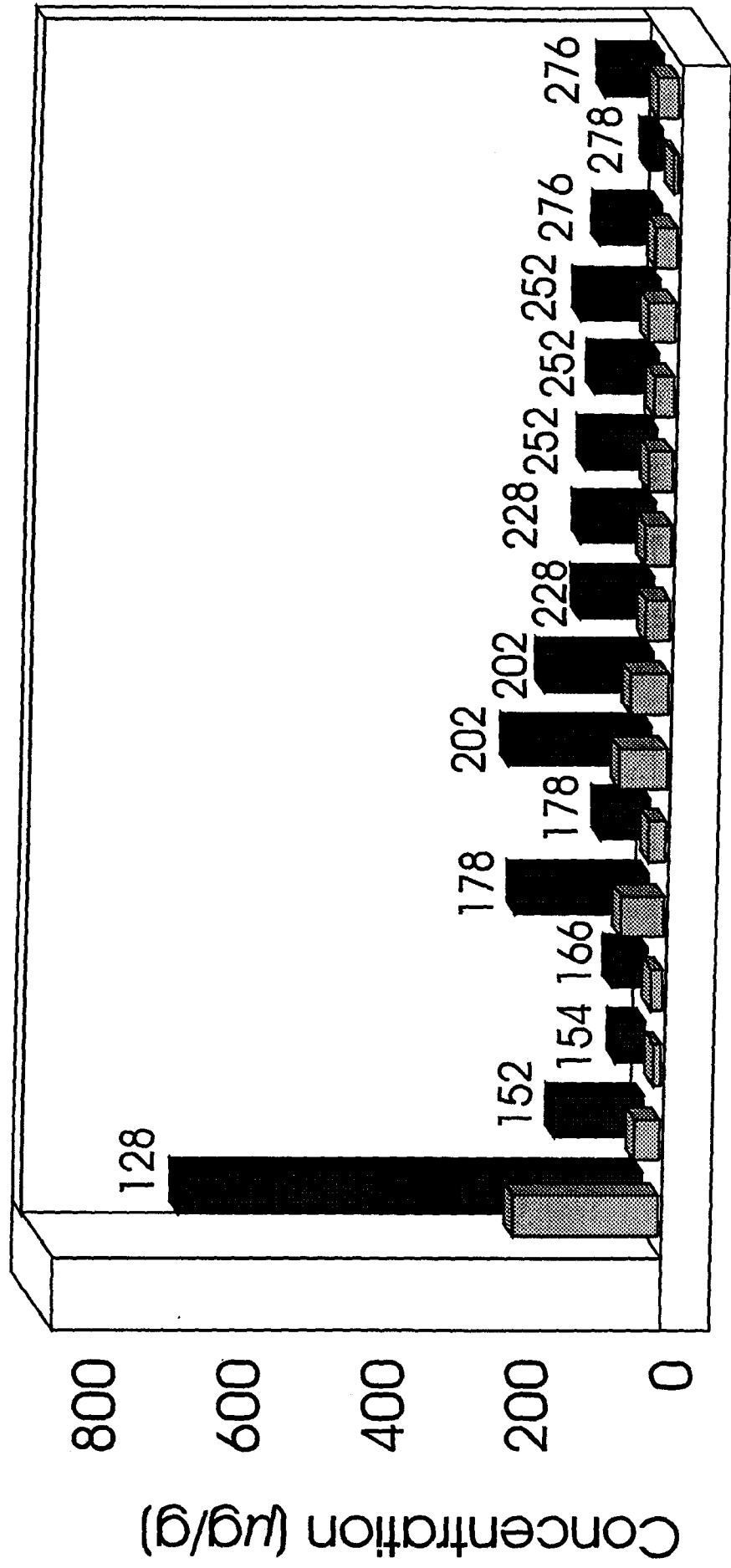
# Acid Volatile Sulphide

Akanoi Bay Microcosms; Aug. 29 - Sept. 29, 1995



# Polynuclear Aromatic Hydrocarbons

## Dofasco Boatslip Laboratory Reactors



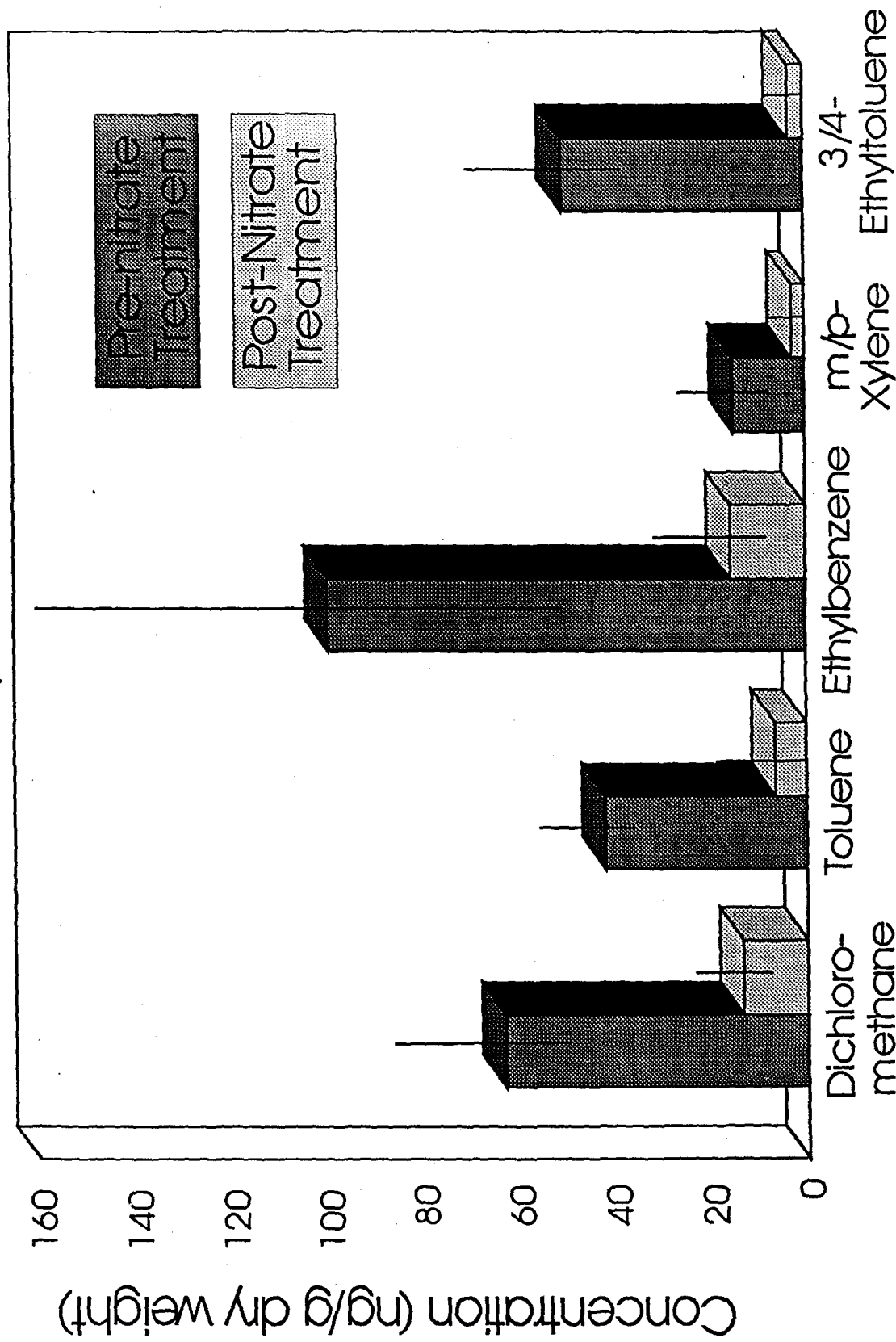
## Polynuclear Aromatic Hydrocarbons

Control Treated

Figure 42

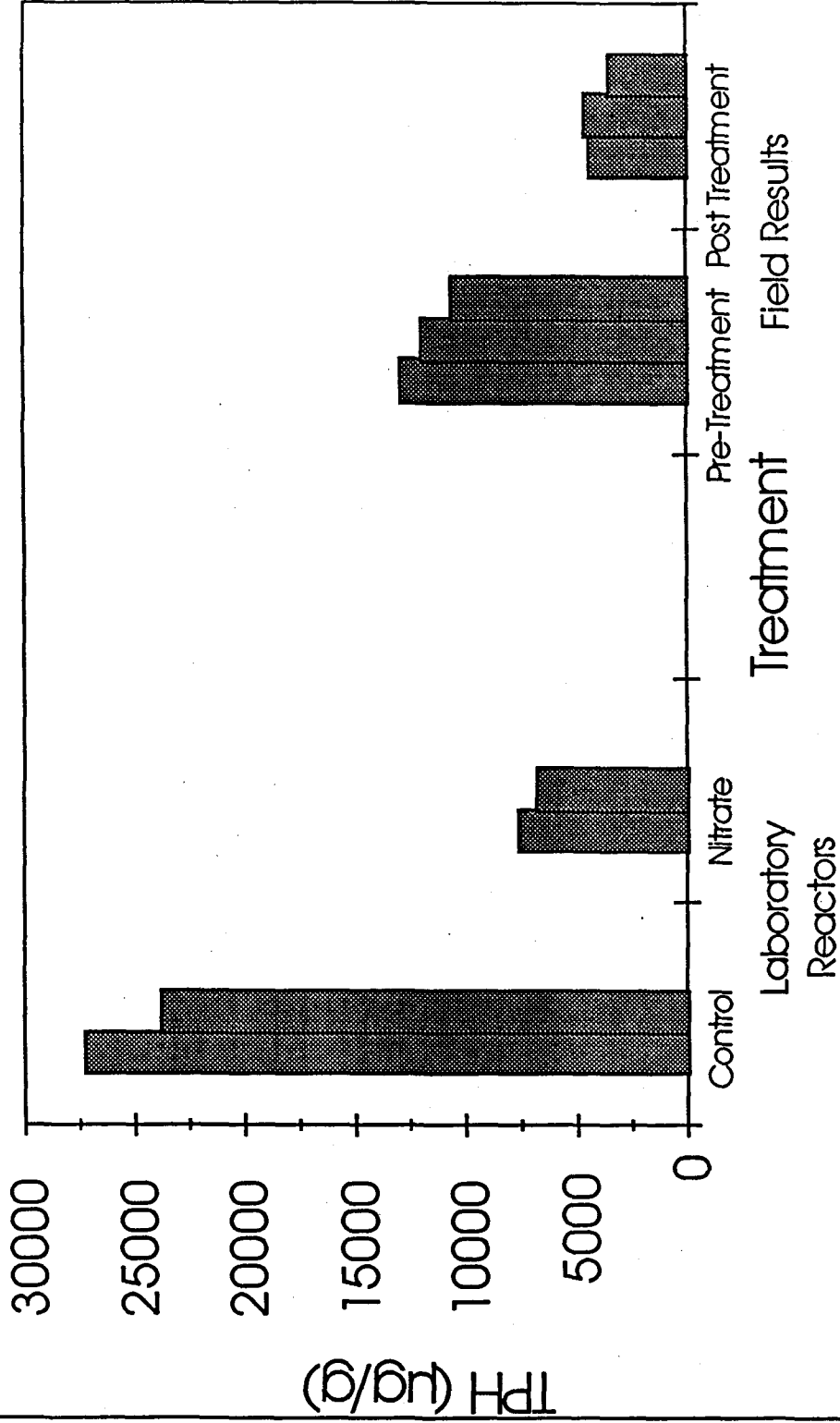
# Biodegradation of Volatile Organics

Dofasco Boatslip, Hamilton Harbour



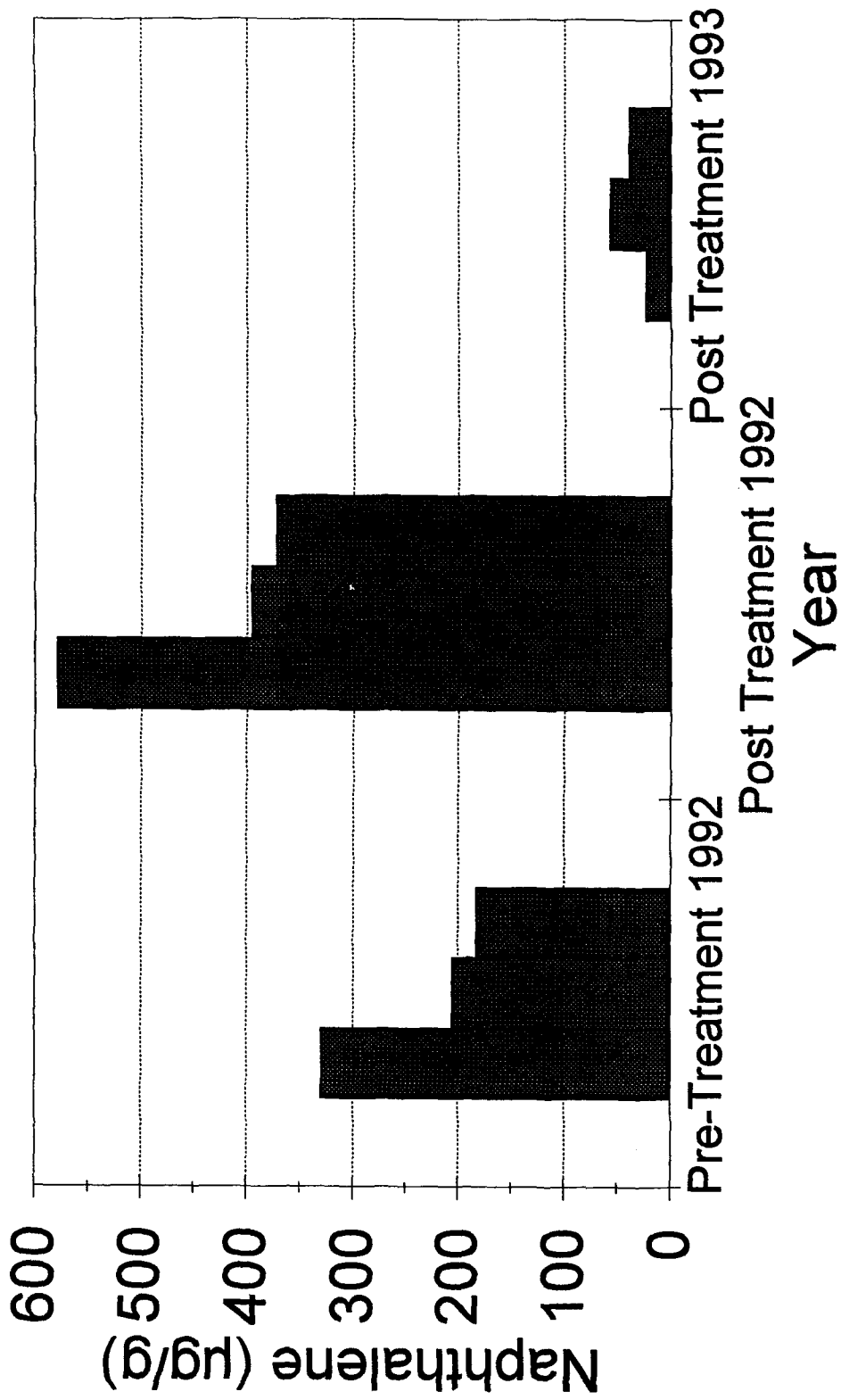
# Total Petroleum Hydrocarbons

Dofasco Boatslip, Hamilton Harbour



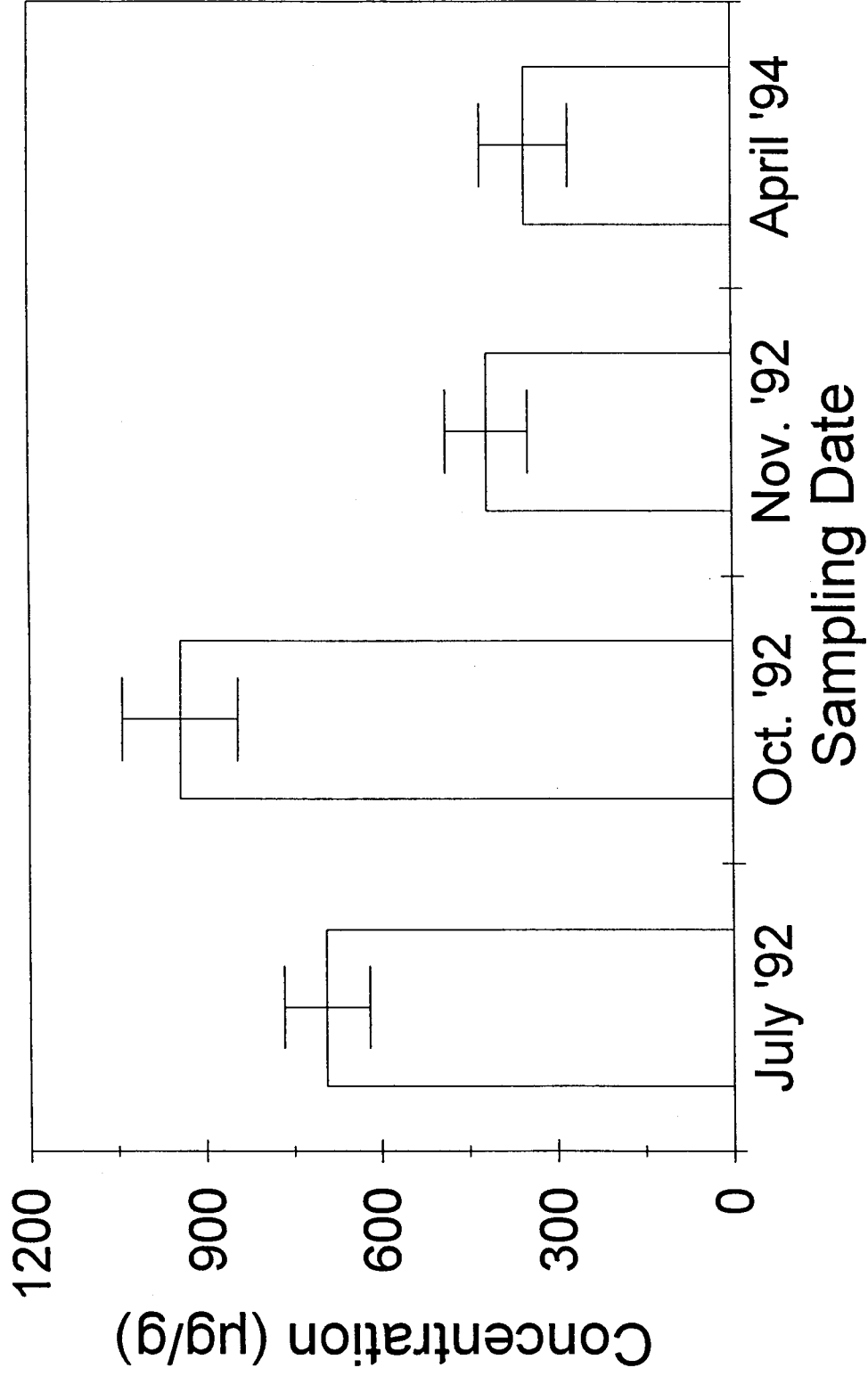
# Naphthalene Concentrations

## Dofasco Boatslip



# Total PAHs

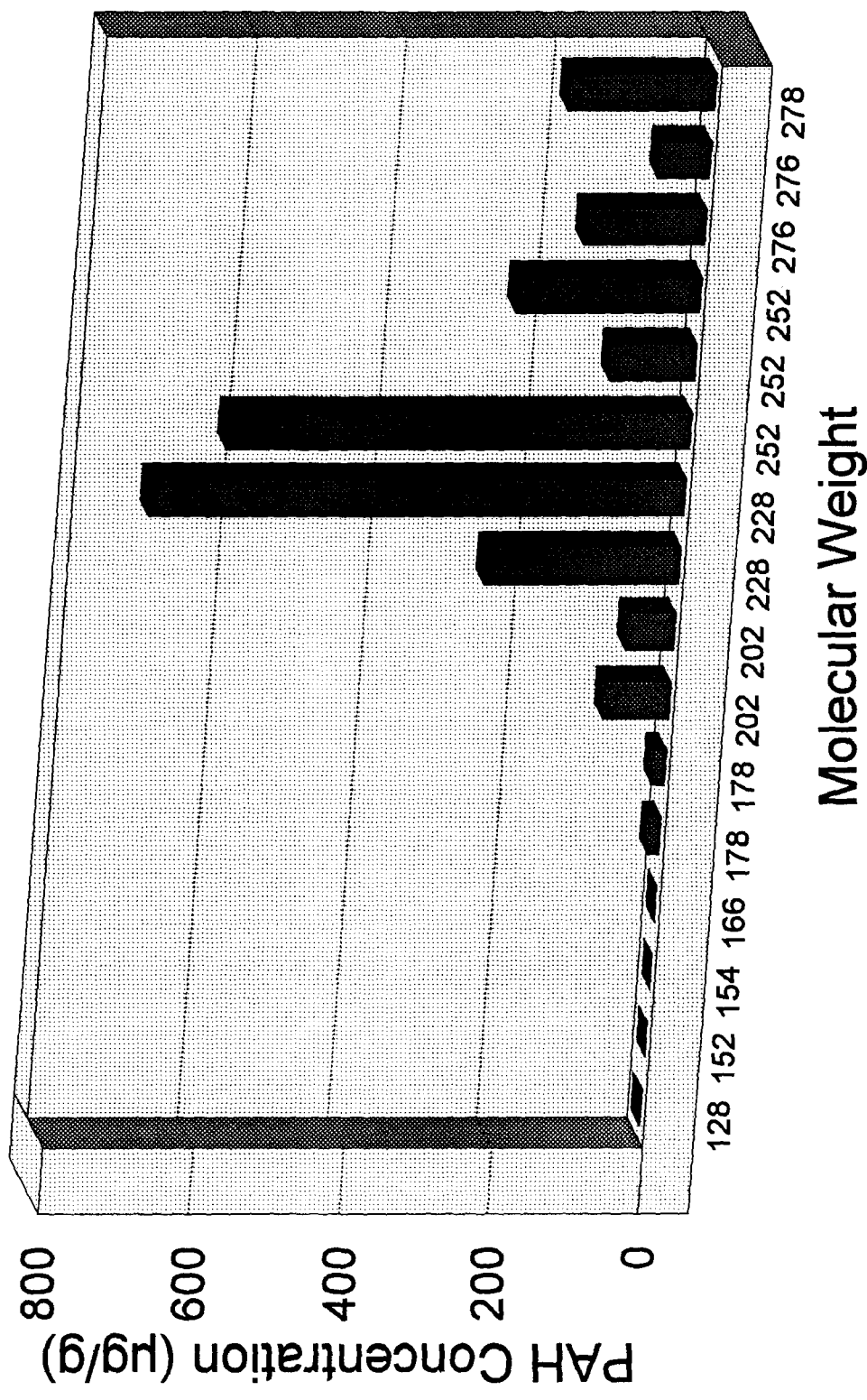
## Dofasco Boatslip, Hamilton Harbour





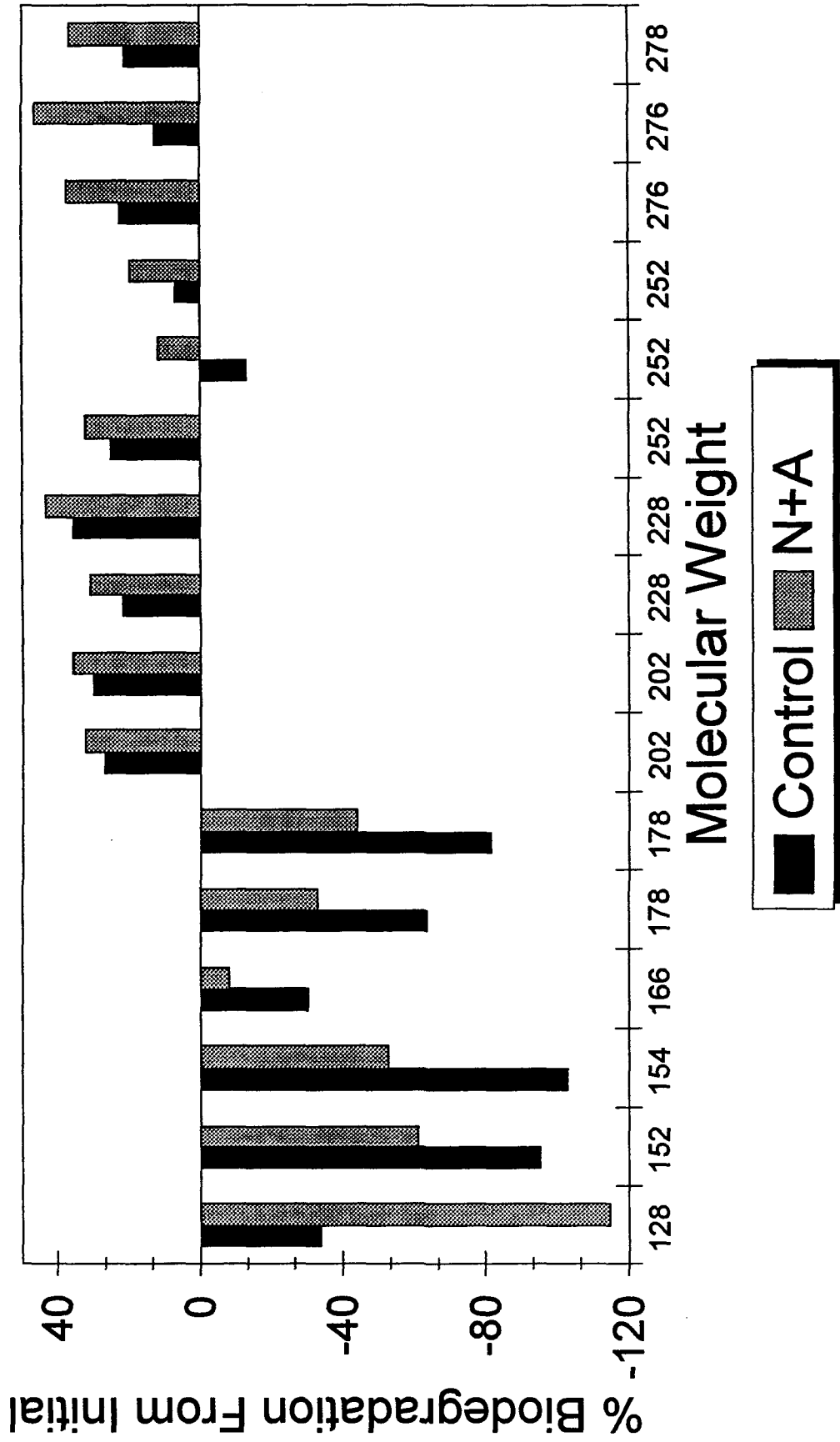
# EPA 16 Priority PAH Concentrations

Industrial Site B: Low Contamination



# Biodegradation of Individual PAHs

Industrial Site B 90 Day Microcosms  
High Contaminated Sediment



# Biodegradation of Individual PAHs

Industrial Site B 180 Day Microcosms  
High Contaminated Sediment

