



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004ND54B

Title: Study of Denitrification in the Karlsruhe Aquifer Using Stable Isotopes of N and O in Nitrate

Project Type: Research

Focus Categories: Groundwater, Nitrate Contamination, Water Quality

Keywords: Groundwater quality, Denitrification, Nitrate contamination, Stable isotopes

Start Date: 05/16/2004

End Date: 08/15/2004

Federal Funds: \$3,000

Non-Federal Matching Funds: \$6,000

Congressional District: At Large

Principal Investigator:
Scott Korom

Abstract

Denitrification is a natural process exhibited in some aquifers by which bacteria reduce NO_3^- to N_2 through the oxidation of organic or inorganic electron donors. One very distinct trait of denitrification is the resulting increase of the heavier isotopes of nitrogen and oxygen in the un-denitrified fraction of the nitrate. During denitrification bacteria prefer to attack the bonds of the lighter isotopes because they are easier to break. It is believed that the data obtained in this research will verify that denitrification is occurring in the Karlsruhe aquifer. Also it is felt that nitrate concentrations will decrease over the winter months at an accelerated rate compared to chloride. Ultimately these factors will provide supporting evidence to the opinion that the lowering of NO_3^- concentrations within the Karlsruhe aquifer is the direct result of natural denitrification.