



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2004TX157B

**Title:** Development of Smoke Tracer Instrumentation for Groundwater Recharge Investigations in the Edwards Aquifer Region

**Project Type:** Research

**Focus Categories:** Groundwater, Hydrology, Methods

**Keywords:** Groundwater recharge methods, hydrology, brush control, hydrogeology

**Start Date:** 03/01/2004

**End Date:** 02/28/2005

**Federal Funds:** \$4,905

**Non-Federal Matching Funds:** \$10,694

**Congressional District:** 31st

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**Abstract**

Throughout much of Texas, a great deal of interest has been exhibited by State and Federal funding agencies in investigating the extent to which the removal of juniper and other nuisance brush species may increase water yields to rivers, streams, and aquifers. However, little is currently known about the extent to which removing juniper may lead to increased groundwater recharge in the Edwards Aquifer region of South Texas.

To address this concern, this project seeks to develop and field test an innovative system that uses smoke as a tracer to map groundwater recharge features a site where several brush control studies are now being carried done. The smoke tracer system will consist of an air blower, a smoke generation chamber, a network of pipes, an injection port, and an adjustable frame.

The smoke tracer will be deployed at Camp Bullis (in the Honey Creek Watershed near San Antonio) at a site directly over a natural cave that is infested with a thick juniper

cover. By utilizing a series of smoke tracer tests, it is anticipated that small, preferential rock fractures can be identified that may be likely to provide important pathways for groundwater recharge.

The smoke tracer unit is being designed so it can be portable and easily assembled and taken apart once experiments are completed. This technology may have a number of advantages over tracer dye studies now routinely conducted since it is a non-invasive method. Most importantly, the research may provide a new perspective on whether clearing juniper may increase groundwater recharge in this and other regions.