

TENNECO/AMOCO
San Juan Basin, New Mexico

**Groundwater Contamination Plume
Modeling and Monitor Network Design**

Alberto A. Gutiérrez served as principal in charge of this project while serving as President of GCL, predecessor to Geolex, Inc.

Throughout the intermountain west, produced water separated from oil and gas at the well head has been traditionally evaporated onsite in unlined disposal pits. Toxic organic compounds were detected in many of these pits in 1985. GCL performed a two-phase program to collect the data needed to develop appropriate rules regarding the disposal of the produced water. A hydrogeologic survey of over 70 well sites was performed and statistical evaluations of over 300 well sites were conducted. This study showed that only one category of wells in the entire population had the potential to degrade groundwater. In all other cases, field evidence showed that biodegradation of toxic organic compounds in the unsaturated zone and dilution of compounds in the saturated zone combined to reduce the concentration of toxic compounds to below New Mexico groundwater standards.

To provide further verification of the field evidence, GCL performed extensive computer modeling of over 20 sites. Using a random-walk solute transport model, GCL further demonstrated that natural processes were capable of reducing the concentration of toxic compounds to below detection limits.

GCL provided expert witness testimony and hearing documents supporting the case and, based primarily on the testimony of GCL, a realistic and environmentally sound rule regarding the disposal of produced water was developed by the New Mexico Oil Conservation Commission.

Major Project Elements:

- Litigation support
- Groundwater modeling
- Program/Project management/QAQC
- Environmental risk assessments
- Regulatory compliance/ Permitting
- Property audit
- Hydrology/Hydrogeology