



ARIZONA WATER RESOURCES NEWS BULLETIN

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INVESTIGATION OF TCE IN ARIZONA'S GROUNDWATER

*(Condensed from an article by Sandra Eberhardt, Bureau of
Water Quality Control, Arizona Department of Health Services)*

The Arizona Department of Health Services (ADHS) has been investigating trichloroethylene (TCE) and related compounds in Arizona groundwater since the solvent was first found in the Tucson International Airport area last spring. TCE is widely used in electronics and metal plating as well as furniture stripping, dry cleaning, and other activities. It can be toxic and has been found to cause cancer in mice.

The contamination at the Tucson Airport was discovered by an Environmental Protection Agency field investigation team studying waste disposal at the Hughes Aircraft Company. Subsequent groundwater monitoring has revealed TCE contamination in the Indian Bend Wash area near the Scottsdale-Tempe boundary; the Phoenix-Litchfield Municipal Airport in Goodyear; and at two wells in the north Tucson area.

TCE Analysis

Analysis of TCE and related compounds requires advanced technology and analytical expertise. The ADHS Laboratory has developed the state-of-the-art capability and is providing analytical services for water supply monitoring and pollution investigations in the state. The Laboratory is also developing a laboratory licensure and certification program for analysis of organic compounds in drinking water by private laboratories and has held an analytical quality control seminar.

Guidelines Established

Despite the known toxicity and suspected carcinogenic nature of TCE, regulatory maximum contaminant levels in drinking water have not yet been established, although the EPA is considering development of such standards. The ADHS, in response to requests for guidance by public water suppliers, developed

voluntary guidelines for TCE. These established 5 parts per billion (ppb) as an action level and allowed up to 50 ppb to be delivered to consumers for short periods of time. The guidelines also established monitoring requirements and gave alternatives for use of contaminated wells, including blending and treatment.

Identification and Cleanup of Pollution Sources

Thus far, fourteen wells have been removed from public water supply service: six in Tucson, two each in Phoenix, Scottsdale, and Tempe, one at the Phoenix-Litchfield Municipal Airport and one north of Tucson. Water supply monitoring is continuing in areas where industries which are associated with this type of pollution are located.

The ADHS is participating with various agencies and organizations in identifying the sources and extent of pollution in the problem areas. Three of the identified areas have been named by the state for consideration for Federal Superfund monies for identification and cleanup of the contamination. The Tucson International Airport area has been the subject of intensive study for the past year. EPA has provided leadership in the investigation and has allocated more than half of its investigative funding for Region IX (which includes California, Arizona, Nevada, and Hawaii) to Tucson TCE investigation. Studies have included soil sampling, well testing, hydrologic investigations, and historical waste disposal practices.

Tucson Area

Five monitoring wells are scheduled to be installed this summer (two at the Tucson International Airport, and three on the San Xavier Indian Reservation) to determine the migration of the pollutants. The City of Tucson, in addition to monitoring water supplies and providing detailed records of wells and water quality, has performed intensive testing of contaminated wells to determine the nature of the plume movement. The Arizona Department of Water Resources provided well drilling records, a field inventory of wells in the study area, and hydrologic



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expertise. ADHS tested more than 100 wells and water system distribution locations in the study area and obtained emergency funding for both shallow and deep soil boring and analysis.

Investigation has indicated that the major sources of TEC and related pollutants in Tucson are in the vicinity of the industrial complex at and near the Tucson International Airport. The airport has cooperated fully with investigators, and Hughes Aircraft Company allowed ADHS and EPA investigators to conduct well testing and soil boring on site. Hughes also launched an independent groundwater study.

Two contaminated wells have been found in the north Tucson area: the first at the Ina Road landfill, located on Ina Road west of I-10; the other at an industrial facility located near Camino del Cerro and I-10. The contaminated landfill well was used only for monitoring. Subsequent to this finding, the landfill management initiated efforts to install a series of wells to ensure adequate monitoring of landfill leachate and prevention of migration. Because of this finding, TCE testing was added to an ongoing study of groundwater quality in the Cortaro area by the Pima Association of Governments (PAG). The industrial well contamination was discovered by the PAG testing. This well is no longer being used to supply drinking water. Monitoring of other drinking water supply wells in the area is being conducted by ADHS to identify possible sources of the pollution.

There have been recent allegations that spent solvents, including TCE, and other materials were illegally dumped into an abandoned well at the Burr-Brown Company in Tucson. The well site, now covered by a building, is located east and north of the identified TCE contamination area near Tucson International Airport. Wells previously sampled in this area revealed no contamination, but more extensive testing of area wells is underway.

Indian Bend Wash Area

Efforts in the Indian Bend Wash area have centered on testing existing wells, soils boring and analysis, studies of historical land use and waste disposal, and experimental analysis of soil gases. The Salt River Project and the cities of Phoenix, Scottsdale, and Tempe cooperated in water supply testing and provision of other information. The Arizona Department of Water Resources participated in hydrologic testing of one contaminated City of Phoenix well, with analytical support provided by ADHS. Further testing of a highly-contaminated Salt River Project irrigation well is planned.

A second experimental phase of the study is the analysis of soil gases by on-site gas chromatography as a means of tracing pollution sources. The University of Arizona Department of Hydrology has initiated these studies and preliminary results look promising. Local funding for intensive studies is limited, but it is hoped that the recent Superfund application will procure federal funding for further investigations in this area.

Phoenix-Litchfield Airport

The contaminated well at the Phoenix-Litchfield Airport was discovered during ADHS monitoring of area water supply wells. It was the only well found to be contaminated, and it served only a small number of consumers at the airport, none of whom resided there. The site is a former Naval Air Station, and it is suspected that the contamination is a result of past disposal practices in the immediate area. Testing is being

conducted to determine the effectiveness of aeration for removal of the organic contaminants. The site is being considered for federal Superfund designation.

Drinking Water Cleanup Fund Established

A state revolving fund of \$500,000 was recently established by the Arizona Legislature for cleanup of contamination in drinking water wells. The program, administered by the ADHS, is expected to begin in July 1982. Although the fund applies to all forms of contamination, it is expected that a sizeable portion of the monies will be designated for TCE cleanup.

DESIGN OF ARIZONA SUBSIDENCE MONITORING PLAN UNDERWAY

Substantial land subsidence is occurring in portions of central and southern Arizona where a major share of the state's population and urban development is located. Last summer a cooperative federal, state, and local survey line around north Phoenix showed evidence of an increasing rate of subsidence within the Salt River Valley, and large ground cracks have appeared in parts of Maricopa and Pinal Counties.

U.S. Geological Survey research has demonstrated that land subsidence in Arizona is directly attributable to declining groundwater levels, but there is a lack of precise data to determine the rate of subsidence in most areas of the state. Governor Babbitt has requested the National Geodetic Survey (NGS) to provide technical expertise and assistance in developing a statewide monitoring plan. The NGS will rely on experience in other parts of the country in designing Arizona's monitoring plan. The plan will identify where monitoring networks should be placed and who should maintain them, so communities can include subsidence effects when planning future development.

Different rates of subsidence, and related earth fissures, are of increasing concern to existing and new development. City water and sewage systems and irrigation systems are often damaged by subsidence. Direct damage to buildings may occur. Virtually all physical elements of surface drainage and flood control are directly affected by subsidence and are of great concern in flood control planning. In addition, subsidence can cause considerable structural damage in flood control dams.

The monitoring plan is expected to be available in late 1982. Ed Nemecek, Chief Hydrologist, Arizona Department of Water Resources, is chairing the interagency review committee for the plan and may be contacted for further information.

EPA ASSESSING HAZARDOUS WASTE FACILITY SITE

The Environmental Protection Agency (EPA), in cooperation with the Arizona Department of Health Services, held two public meetings February 18 to identify public concerns regarding the siting of a hazardous waste management facility near Mobile, Arizona, 35 miles southwest of Phoenix.

An environmental impact statement (EIS) is being prepared on the proposed sale of federal land to Arizona for use as a hazardous waste facility. The EIS will include an assessment of such factors as water quality, community development, energy, air quality, potential health risks, land use, and potential resource damage. Other issues to be addressed in the EIS are alternative transportation routes to the site and alternative hazardous waste management options.

STATE'S SURFACE WATER REGULATIONS AMENDED

Amendments to the state's regulations for surface waters (rivers, lakes, and streams) were adopted by the Arizona Water Quality Control Council on April 13 after a series of public hearings in Phoenix, Springerville, Tucson, and Yuma.

Topics covered at the hearings were the incorporation of the 1981 update of the salinity control program by the Colorado River Basin Salinity Control Forum; nutrients limits for the Little Colorado River watershed above Lyman Lake; and a proposal to exclude selected surface waters (such as the San Pedro and the Santa Cruz River Basins) from state standards for nutrients.

GROUNDWATER PROTECTION REGULATIONS BEING PREPARED

The Arizona Department of Health Services (ADHS) recently held a series of public workshops on the state's proposed groundwater protection regulations. The ADHS staff is currently making changes to the draft regulations based on issues raised in those workshops.

An economic impact statement is being prepared to assess the costs and benefits of the proposed regulations. The statement will be submitted to the Governor's Regulatory Review Committee in August, pursuant to the state's requirements for new regulations. Public hearings on the proposed regulations will be held in November, with adoption by the Water Quality Control Council and Arizona Department of Health Services expected by January 1983.

NEW WATER RESOURCES ASSOCIATION FORMED

The Southern Arizona Water Resources Association (SAWARA) held its first annual meeting June 2, 1982. The articles of association were ratified, and a 30-member Steering Committee was elected. Officers of the organization, elected at a subsequent meeting of the Steering Committee on June 9, are Buck O'Rielly, president; George Barr, vice president; Jim Cocke, treasurer; and Luther Davis, secretary.

The primary goal of the group is to work toward solving the area's water problems. A major focus will be the speedy completion of the Tucson portion of the Central Arizona Project. The group intends to work closely with local, state, and federal interests.

A monthly newsletter will be sent to all members, and public education programs will be undertaken to increase community awareness of area water problems and possible solutions. Membership is open to any individual, business, or institution supporting the goals of the group.

For information regarding membership or SAWARA activities, contact George Barr, 2075 N. 6th Avenue, Tucson, Arizona 85705. Telephone (602) 624-7401.

PUBLICATIONS

An Evaluation of the Effectiveness of Combining Economic and Physical Ground-Water Models, a 30-page report by Thomas Maddock III, is available from the University of Arizona Water Resources Center for \$3 per copy.

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Ground Water Hydrology for Water Well Contractors, a revised guide for groundwater exploration, is now available through the National Well Water Association (NWWA). The publication includes information on groundwater geology, map use, logging tools, geological structure, and groundwater contamination. Price is \$20 per copy for NWWA members and \$25 for non-members.

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The Future of Water and the Bureau of Reclamation, prepared by J.F. Coates, Inc. for the Bureau of Reclamation, is a survey of water resources professionals in the public and private sectors. Water use competition and groundwater depletion and contamination were seen as the most serious U.S. water problems in the 1990s, and the role of the federal government was questioned. The survey was designed to complement an internal survey of Bureau of Reclamation officials on the future of the Bureau. For more information, contact Henry H. Hitchcock, J.F. Coates, Inc., 3738 Kanawha Street NW, Washington, D.C. 20015. Telephone (202) 966-9307.

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Water Issues Primer focuses on water issues in the Tucson area. It includes information on water supply and competing use and explains key issues such as Indian water rights, the Central Arizona Project water delivery, and other possible sources of augmented water supply. The Arizona Groundwater Management Act is outlined. The publication is available from the Tucson Active Management Area, Arizona Department of Water Resources, 371 South Meyer, Tucson, Arizona 85701. Telephone (602) 628-5858. Price is \$5 per copy.

CONFERENCES

The American Water Resources Association (AWRA) Eighteenth Annual Conference entitled Water – Are We Running Out? will be held October 10-14, 1982 in San Francisco, California. AWRA is also sponsoring a symposium on the San-Joaquin/Sacramento Delta to be held in San Francisco October 13-14, 1982, with a field trip to the San-Joaquin/Sacramento Delta on Friday, October 15. For further details regarding the conference or symposium, contact the AWRA National Office in Minneapolis, Minnesota, or General Chairman Dave Stephenson, Woodward-Clyde Consultants, Three Embarcadero Center, Suite 700, San Francisco, California 94111. Telephone (415) 956-7070.

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