

Air Force Plant 44 (AFP-44)/Raytheon Project Area

[Part of the Tucson International Airport Area (TIAA) [EPA CERCLA Site](#)]

Boundaries:

This [project area](#) is located in the southern portion of the Tucson International Airport Area (TIAA) [Comprehensive Environmental Response, Compensation and Liability Act \(CERCLA\)](#) Site. The site is on the [National Priorities List \(NPL\)](#), which is periodically updated by the [U.S. Environmental Protection Agency \(EPA\)](#). The plant is located about eight miles south of downtown Tucson, Arizona and is bounded to the north and east by the Tucson International Airport, to the south by Hughes Access Road and to the west by the Nogales Highway (Route 89).

Site Status Update:

The U.S. Air Force (USAF) recently installed an [advanced oxidation](#) treatment system that replaces the original large-scale groundwater treatment plant that began operating in 1987. The new system will treat [volatile organic compounds \(VOCs\)](#) and [1,4 dioxane](#) and is expected to begin operating by Summer 2009.

The original groundwater remediation system removed approximately 23,986 pounds of VOCs from the regional aquifer, and treated over 25.5 billion gallons of groundwater between 1987 and the end of 2008. Additionally, the shallow groundwater zone was remediated with a [Dual-Phase-Extraction \(DPE\)](#) System. This system [pumped and treated](#) shallow groundwater and lowered the water table to expose more [vadose zone](#) to [soil vapor extraction \(SVE\)](#) treatment, thereby accelerating VOC removal. SVE systems have also been used to remediate source areas. Together, the DPE and SVE systems removed over 107,514 pounds of VOCs from subsurface soils.



**Air Force Plant 44
Groundwater Treatment Plant**

The Phase II focused [remedial investigation \(RI\)](#) for 1,4-dioxane will begin in 2009.

Community Involvement Activities:

To provide community members with an opportunity to learn about the cleanup process and to obtain local perspective for decisions concerning the cleanup, a [Unified Community Advisory Board \(UCAB\)](#) was formed in 1995. The UCAB meets the third Wednesday of January, April, July, and October. These meetings occur at 6:00 p.m. at the El Pueblo Community Center located at 101 W. Irvington Road in Tucson and are open to the public.

The USAF publishes [a semi-annual progress report](#) for activities at Air Force Plant 44. The USAF and Raytheon are also active participants in the annual Earth Day celebration in Tucson, and in education and outreach to Tucson schools.

Site History:

1950s: This site is a federally-owned weapons manufacturing facility operated under contract by the [Raytheon Company](#) (formerly [Hughes Missile Systems](#)). The facility occupies over two million square feet of buildings. Past waste disposal practices included: industrial wastewater treatment, storage, and disposal; discharge of wastes into unlined surface impoundments; and land disposal of industrial wastewater, spent [solvents](#), and dilute and concentrated acids and alkalines. Waste disposal practices led to widespread soil and groundwater contamination at the site. Resulting groundwater contamination has spread northward beyond the project area boundaries because of the regional groundwater flow gradient.

Groundwater contamination was first noted in the early 1950's when elevated levels of [chromium](#) were detected in a municipal water supply well near AFP-44 and when residents near the Tucson International Airport complained about water quality problems in their private wells.

1976: The State of Arizona closed a well at AFP-44 due to high levels of chromium.

1981: The EPA and the [Arizona Department of Health Services](#) identified VOCs in the upper zone of the regional [aquifer](#) beneath the Tucson International Airport. Beginning in 1981, the [City of Tucson](#) closed all municipal wells that exceeded the state action level for [trichloroethene](#) (TCE), the primary groundwater contaminant, and notified private well users of the potential risks.

1983: The TIAA Superfund Site (which includes the Air Force Plant 44 project area) was added to the NPL on [September 8, 1983](#). Soon thereafter, the USAF began an extensive investigation of groundwater contamination at the AFP-44 Site, which revealed high levels of TCE in the groundwater.

1985: The USAF issued a [Record of Decision](#) (ROD) for the regional groundwater at AFP-44.

1987: A large-scale pump, treat, and reinjection system was constructed. This system was installed to provide containment and remediation of regional aquifer groundwater contamination.

1991-1992: An RI of soil contamination at AFP-44 was conducted with supplemental field work being completed in 1993 and 1995.

1993: A [risk assessment](#) was performed to identify soil sites that required remediation.

1995: Beginning in 1995, nearly 57,000 tons of metals-contaminated soils ([cadmium](#), [chromium](#), and [lead](#)) have been excavated and removed from the site.

1994-1997: A [feasibility study](#) (FS) for soil remediation was completed. From 1994 to 1996, DPE systems were installed to treat VOC-contaminated soils and groundwater. In 1996, large-scale SVE systems were built to remove VOCs from soils. In 1996 and 1997, the USAF produced a new ROD that specified SVE treatment of VOC contaminated soils at AFP-44.

2000: In September, one source area (Site 1) was closed after vadose zone contamination was reduced to a level where groundwater would not be impacted above the [maximum contaminant level](#) (MCL).

2002-2004: During the spring and summer of 2002, 1,4-dioxane was discovered at the site in concentrations ranging from 1.0 to 54 parts per billion (ppb). In 2004, an additional [monitor well](#) at AFP-44 yielded a 1,4-dioxane concentration of 600 ppb.

At Site 2, post-SVE monitoring was completed. Vadose zone contamination was reduced to a level that will not impact groundwater above the TCE MCL.

2006: The [U.S. Geological Survey Arizona](#) Water Science Center and the USAF Aeronautical Systems Command sampled several wells in July to investigate 1,4-dioxane contamination in groundwater west of Air Force Plant 44 and to further define the extent of the 1,4-dioxane groundwater plume. In the 34 wells sampled, 1,4-dioxane concentrations ranged from non-detect to 11 ppb.

2007: On July 13, 2007, the EPA issued an order to the USAF and Raytheon to design, build, and operate an advanced oxidation treatment plant at Air Force Plant 44 to treat TCE and 1,4-dioxane. This plant will replace the existing treatment plant. EPA issued this order using provisions from the Safe Drinking Water Act. Additionally, in April 2007, EPA issued a draft settlement agreement to the USAF to initiate a focused RI/FS of 1,4-dioxane.

In late 2007, the USAF submitted a revised draft Federal Facilities Agreement to EPA and the Arizona Department of Environmental Quality (ADEQ).

2008: The advanced oxidation treatment system upgrade was delivered to Air Force Plant 44 in June, and the USAF proceeded with installation of the system.

The USAF completed the Phase I focused remedial investigation of 1,4-dioxane. The Phase I focused RI for 1,4-dioxane included data acquisition and management, review of historical reports and models for the TIAA site, and evaluation of 1,4-dioxane water quality data collected by the USGS.

The USAF submitted to the agencies a Shallow Groundwater Zone Remedial Process Optimization Work Plan in October. The work plan included installation of new monitor wells to further characterize the shallow groundwater zone.

Contaminants:

The current contaminants of concern in soil and groundwater include metals and [volatile organic compounds](#) (VOCs). The principal contaminants of concern are [trichloroethene](#) (TCE), [1,1-dichloroethene](#) (1,1-DCE) and [chromium](#). Contaminants of concern at the site may change as new data become available. In addition, 1,4-[dioxane](#) has been discovered in groundwater.

Public Health Impact:

All municipal wells in the area that were contaminated with VOCs have been shut down. The municipal water supply in the area now comes from wells outside the site, and water produced from these wells meets all state and federal drinking water standards. Some privately owned domestic use wells in the area have been impacted, but these wells have either been shut down or converted to irrigation wells. If you are drinking water from a private well within the boundaries of the TIAA site, please contact the ADEQ Project Manager. Areas with soil contamination at or very close to the surface have been excavated so that there are no known public health impacts from contaminated soils.

Site Hydrogeology:

The regional aquifer beneath most of AFP-44 is divided into three main hydrogeologic units including the upper zone, a middle [aquitard](#), and the lower zone. The middle aquitard pinches out several miles north of the site, and the upper and lower zones merge into one regional undivided aquifer. The upper zone (where nearly all of the groundwater contamination is present) is composed of layers of gravelly sand interbedded with clayey sand and sandy clay. A low permeability layer of clay and silt occurs near the potentiometric surface within the upper zone which, due to its hydraulic properties, retains high concentrations of VOCs.

In 1987, the depth to groundwater at AFP-44 was from 90 to 140 feet below ground surface (bgs) prior to the startup of the groundwater pump and treat system. Currently, the depth to groundwater ranges from 90 to 160 feet bgs. Under ambient conditions, groundwater flow direction in the upper zone is toward the northwest.

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*In Arizona, but outside the Tucson area, call toll-free at (888) 271-9302.

**Call EPA's toll-free message line at (800) 231-3075.

Information Repository:

Interested parties can review select site documents at the TCE Superfund Information Library located at 101 W. Irvington Road, within the [El Pueblo Branch Library](#) in Tucson, (520) 594-5250. The complete official site file can be reviewed at the EPA Region IX, [Records Center](#), Mail Stop SFD-7C, 95 Hawthorne Street, Room 403, San Francisco, CA 94105, (415) 536-2000.

The ADEQ site file is located in Phoenix at the ADEQ Central Office at 1110 W. Washington Street; however, select documents are also available in Tucson at the [Southern Regional Office](#) at 400 W. Congress, Suite 433. Files are available for review Monday through Friday from 8:30 a.m. to 4:30 p.m. To arrange for a time to review the site file at the main ADEQ office, please call the ADEQ Records Management Center with 24-hour notice at (602) 771-4380 or (800) 234-5677 (Arizona toll-free). Please call (520) 628-6715 to arrange a file review appointment at the Southern Regional Office.