



Tucson International Airport Area (TIAA) Superfund Site

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • JUNE 2002

EPA Proposes Plan to Address Groundwater Contamination at West-Cap and West Plume B Project Areas

Proposed Plan at a Glance

The problem: During past industrial operations in Area B of the Tucson International Airport Area Superfund Site, contaminants were released into the soil. Some of these contaminants are now in the groundwater at the West-Cap and West Plume B Project Areas of the Site.

The solution: To address this contamination, the US Environmental Protection Agency (EPA) proposes to use a combination of technologies designed to 1) prevent further migration of the contaminants, 2) remove and treat contaminants from the groundwater until cleanup levels are achieved, and 3) prevent future human and environmental exposure to the contaminants. EPA proposes to address groundwater contaminants by using extraction and treatment. The preferred cleanup technologies will be designed to prevent or minimize discharge of contaminants to the air.

Your comments: Comments on this Proposed Plan are welcome both during our public meeting on **July 18**, and in writing to EPA (see back page for contact information). EPA will consider these comments as we develop our final cleanup decision, and responses to comments will be in the final decision document.

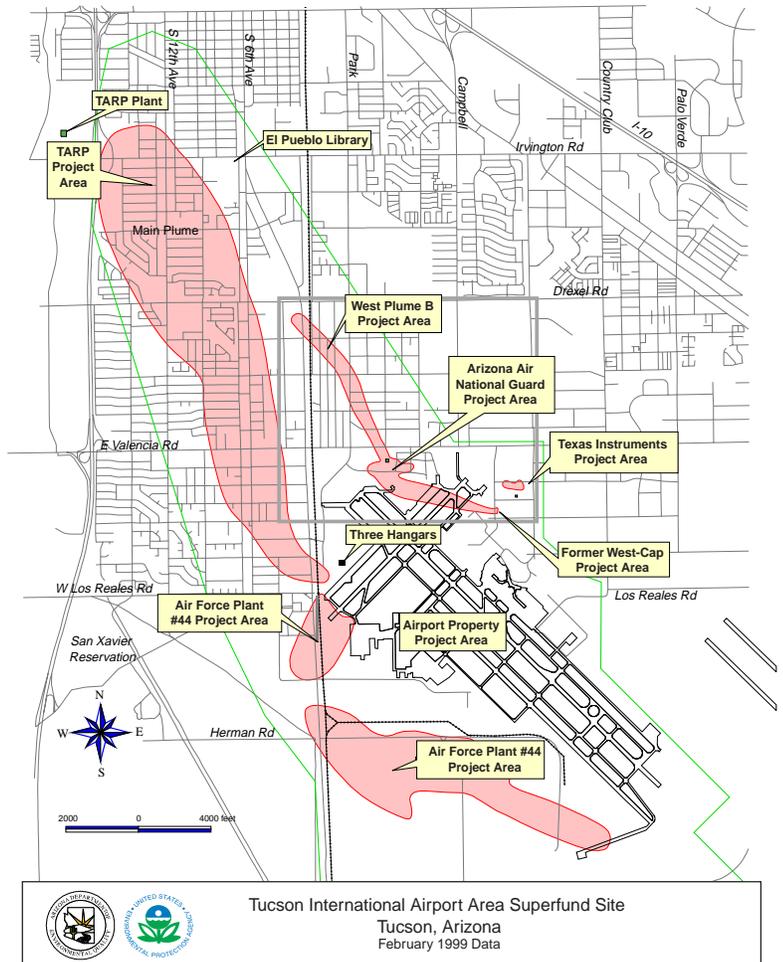


Figure 1: Location of Tucson International Airport Area Superfund Site

Community Meeting

Thursday, July 18, 2002
6:30 p.m.

El Pueblo Center, Rooms B & C
(behind the library)
101 W. Irvington Road
Tucson, Arizona

Comment Period

June 26, 2002 to July 26, 2002

Introduction

In 1988, EPA issued a Record of Decision (ROD) to address contamination in the drinking water aquifer north of Los Reales Road at the Tucson International Airport Area Superfund Site. In the 1988 ROD, contamination in the aquifer was divided into Area A to the west and Area B to the east. EPA selected a remedy to address the contamination in Area A, but deferred characterizing the extent of contamination around the former

West-Cap property and West Plume B Project Areas. The former West-Cap property (WC Project Area) and West Plume B (WPB Project Area) are part of the Tucson International Airport Area Superfund Site (TIAA) and are located east and north, respectively, of the International Airport in Tucson, Arizona (see Figure 1).

In May 2002, EPA completed a remedial investigation (RI) and feasibility study (FS) to characterize the nature and extent of the contamination and to evaluate methods to clean up groundwater contamination at the WC and WPB Project Areas. This Proposed Plan summarizes the evaluation of alternatives from the FS, which are presented in Table 1 on page 5. To be considered as a possible remedy, the alternative must meet EPA's two "threshold" criteria: (1) protection of human health and the environment and (2) compliance with federal and state applicable or relevant and appropriate requirements (ARARs). In addition to these two criteria, there are seven additional "balancing" and "modifying" criteria that EPA must consider when evaluating a remedy. All nine criteria are discussed in the section "EPA's Remedy Selection Criteria" (see Figure 2, page 3).

The upcoming remedy decision will amend the 1988 ROD for the TIAA Site. This Proposed Plan describes the cleanup alternatives that were evaluated for the project areas and identifies EPA's preferred alternative. The preferred alternative will stop the migration of contaminants and will clean up the groundwater.

EPA's Preferred Alternative

After evaluating three cleanup alternatives, EPA prefers extraction and treatment of the contaminated groundwater (Alternative 3) as the remedy that provides the best balance among the criteria. In the WC Project Area, Alternative 3 includes groundwater extraction from two existing and two new extraction wells, treatment of the extracted groundwater, addition of two new monitoring wells, and community notification to prevent use of contaminated groundwater. In the WPB Project Area, Alternative 3 includes groundwater extraction using one extraction well, treatment of the extracted groundwater, addition of two new monitoring wells, and community notification to prevent use of contaminated groundwater. EPA believes that Alternative 3 provides the best overall remedy by containing, extracting, treating, and monitoring the WC and WPB Project Area contaminated groundwater.

Site Background

The City of Tucson requested that EPA address the groundwater contamination at TIAA in 1981 when elevated levels of volatile organic compounds (VOCs), including trichloroethylene (TCE) and tetrachloroethylene (PCE), were found in south-side Tucson drinking water wells. As a result, local water providers stopped using those wells for drinking water. The entire Site, including the Area B plume, was placed on EPA's National Priorities List (NPL), or Superfund list, in 1983. EPA and the Arizona Department of Environmental Quality (ADEQ) have been involved in investigations and cleanup activities at TIAA since the initial discovery of VOCs in the groundwater. In total, TIAA covers approximately a 10-square-mile area. The Site has been divided into seven areas known collectively as the Tucson International Airport Area Site (see Figure 1, page 1). This fact sheet focuses on the former West-Cap and West Plume B groundwater areas only. More information on the TIAA Site can be obtained at the **Tucson Public Library, El Pueblo Branch**, 101 W. Irvington Road, Tucson, AZ.

There are many existing and former industrial facilities in the TIAA area. Up until the 1970s, prior to the current environmental regulations, industrial solvents containing VOCs and other contaminants were typically disposed of directly onto the ground or into unlined pits or trenches. These disposal practices, along with other releases, resulted in the current groundwater contamination at the TIAA Site. Based on extensive well sampling, EPA has determined that the groundwater in the WC and WPB Project Areas is contaminated in the Upper Zone of the regional aquifer. Land use in the vicinity of the WC and WPB Project Areas includes residential, military, aviation, industrial/commercial, undeveloped open space and washes. Areas near WPB are primarily residential, while the area around WC is exclusively military, aviation and industrial/commercial.

The specific water-bearing zones beneath the WC and WPB Project Areas differ, affected by the presence or absence of sand, gravel, silt and clay that, in turn, impact how groundwater moves. At the WC Project Area, there are two layers separated by clay-type materials. These layers are referred to as the Upper and Lower Subunits. At the WPB Project Area, the Upper Zone (aquifer) appears less continuous than the subunits at the WC Project Area.



Figure 2: EPA's Nine Remedy Selection Criteria

Opportunity for Public Comment

EPA will accept comments on this Proposed Plan from June 26, 2002 through July 26, 2002. During that period, written comments can be submitted to Andrew Bain at EPA (see back page for contact information). Comments presented at the Proposed Plan Public Meeting, scheduled for July 18, 2002, will be recorded.

After review, consideration and response to public comments, EPA will formally announce the selected remedy in an amendment to the 1988 ROD (ROD Amendment). The remedy for the TIAA site may differ from the preferred alternative in this plan as a result of public comments.

EPA encourages the public to review the RI and FS reports as well as other reports in the Administrative Record and comment on any of the alternatives presented in this Proposed Plan. A copy of the Administrative Record is located at the El Pueblo Library, 101 W. Irvington Road, Tucson, Arizona and at the EPA Region 9 office in San Francisco.

Groundwater Cleanup Actions Previously Implemented at TIAA

Groundwater contamination at the TIAA Site has been addressed in several phases:

- In 1987, the U.S. Air Force began operation of a groundwater pump and treat system to address contamination at the Air Force Plant 44 facility.

- In 1988, EPA selected a remedy to treat the groundwater north of Los Reales Road by pumping and treating the contaminated groundwater followed by discharging the treated water to the municipal water distribution system.

The water is treated with an air stripper and the air emissions from the treatment process are treated using granular activated carbon. The Tucson Airport Remediation Project (TARP) treatment plant started operation in 1994 and, to date, has removed approximately 1,955 pounds of VOCs. The system is expected to remain in operation until at least 2025.

- In 1992, Texas Instruments (formerly Burr-Brown), began operation of a groundwater pump and treat system to address the contamination at their facility.

- In 1996, the Air National Guard began construction of a treatment system to address the contamination beneath the Air National Guard property. The groundwater extracted at the Air National Guard facility is treated and then reinjected into the aquifer.

- In 1998, EPA began a short-term action to extract and treat contaminated water at the former West-Cap facility. The system is still operating.

- Design of a groundwater treatment system to address contamination in the shallow groundwater at the Airport Property is currently underway.

Site Characteristics

The contaminants of concern in the groundwater at the WC and WPB Project Areas are VOCs. TCE is the primary VOC of concern. PCE, 1,1-dichloroethene (1,1-DCE) and *cis* 1,2-dichloroethene (1,2-DCE) are also present at lower concentrations. Only TCE and PCE are present at levels above the federal Safe Drinking Water Act Maximum Contaminant Levels (MCLs), EPA's and the State of Arizona's standards for drinking water quality. The MCL for TCE is 5 parts per billion (ppb). The groundwater plumes at WC and WPB are defined by TCE levels greater than the MCL, 5 ppb.

The Upper Zone of the regional aquifer where the contaminants are found is located at approximately 85 to 100 feet below ground surface (bgs) and is approximately 70 to 100 feet thick. As shown in Figure 3, the WC groundwater contamination extends from the former West-Cap property at Plumer and Elvira roads in the east to midway across the Airport Property on the northwest, possibly mixing with the Arizona Air National Guard facility south of Valencia Road. The WPB groundwater contamination stretches from around Valencia Road in the south and extends northwesterly towards Drexel and Fontana roads in the north.

In general, TCE and PCE levels in the WC Project Area monitoring wells have been decreasing since the interim pump and treat system was installed in 1998, with the exception of the area directly beneath the former WC property. The highest level of TCE reported during the Remedial Investigation (RI) report, observed beneath the former WC property, was 270 ppb in May 2000. The highest PCE level for the study period was 43 ppb.

In the WPB Project Area, the highest levels of TCE contamination were approximately 18 to 30 ppb, with the highest concentrations detected in samples collected in February 1999.

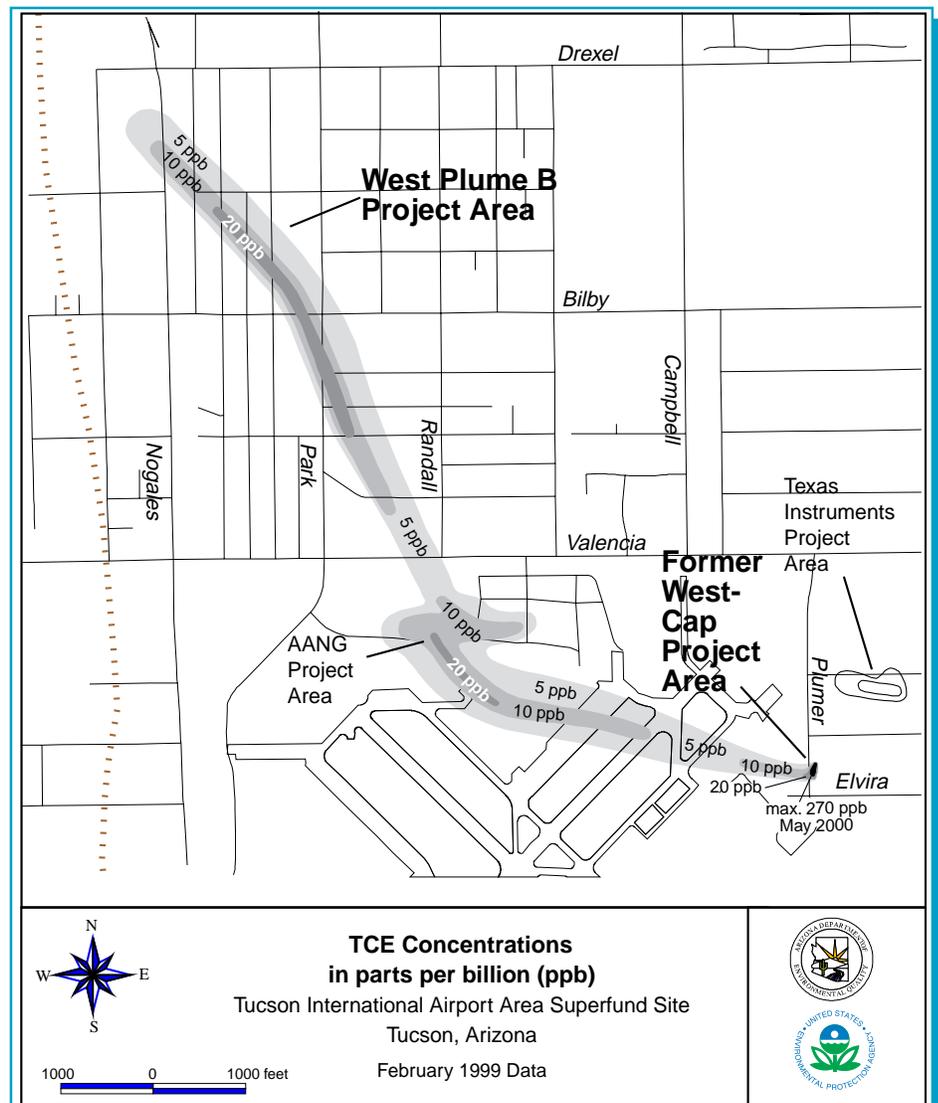


Figure 3: Contamination at the West Plume B and West-Cap Project Areas

The alternatives evaluated in the FS assume that the Arizona Air National Guard (AANG) and Texas Instruments treatment systems already in place will continue to capture and treat contamination in the specific areas they address. The preferred remedy is intended to complement the groundwater cleanups at these other facilities.

Summary of Site Risks

To help determine whether action is necessary to protect human health at a site, EPA considers the health risks to people who might be exposed to the chemicals of concern. When assessing human health risks, EPA considers two types of risks: cancer risk and non-cancer risk. The contaminants at TIAA pose a potential cancer risk.

West-Cap and West Plume B Cleanup Alternatives			
Alternative	Treatment Option	End Use Option	Estimated Present Worth 30-yr (\$ millions)
1- No-Action	None	Not Applicable	-
2- Natural Attenuation			
Former West-Cap	None	Not Applicable	2.1 M
West Plume B	None	Not Applicable	2.0 M
3*- Extraction and Treatment Options - 40 gallons per minute			
West-Cap			
Cleanup and Containment (1)	Texas Instruments Air Stripping Facility	Texas Instruments Facility	5.8 M
Cleanup and Containment (1)	Air Stripper w/ Off-gas Treatment - or Carbon Adsorbent Unit	Reinjection into the Lower Subunit	5.5 M 5.9 M
Cleanup and Containment (1)	Air Stripper w/ Off-gas Treatment - or Carbon Adsorbent Unit	Discharge to Sanitary Sewer	5.9 M 6.4 M
West Plume B - 20 gallons per minute			
Cleanup and Containment	Air Stripper w/ Off-gas Treatment - or Carbon Adsorbent Unit	Irrigation	5.3 M 5.5 M
Cleanup and Containment	Air Stripper w/ Off-gas Treatment - or Carbon Adsorbent Unit	Reinjection into the Upper Subunit	5.1 M 5.3 M
Cleanup and Containment	Air Stripper w/ Off-gas Treatment - or Carbon Adsorbent Unit	Discharge to Sanitary Sewer	5.2 M 5.4 M
Cleanup and Containment	Air Stripper w/ Off-gas Treatment - or Carbon Adsorbent Unit	Drexel Rd pipeline for irrigation	5.2 M 5.4 M
Cleanup and Containment (2)	TARP Treatment Facility (Air Stripper)	TARP Treatment Facility	5.1 M

(1) Costs reflect Extraction Option 1 (Constructing two new extraction wells, two monitor wells)

(2) Cost reflects using TARP Facility for treatment of groundwater

* Actual cleanup time for the extraction and treatment alternative is expected to take 10 years, however, for comparison, all costs are calculated for a 30-year time frame.

Table 1: Cleanup Options

A TIAA Site-wide risk assessment was performed in 1996 and was summarized and updated with WC and WPB-specific water data for the RI/FS report. The risk calculations indicated that the highest potential cancer risk would have been approximately 3 in 10,000 if people consumed untreated water from contaminated supply wells within the West-Cap area. This means that if 10,000 people consumed untreated water for a lifetime, three additional people would be expected to develop cancer. Because this is an unacceptable risk, EPA is required to take remedial action.

It is EPA's current judgment that the preferred alternative identified in this Proposed Plan is necessary to protect public health and the environment from actual or threatened releases of hazardous substances into the environment. The cleanup of groundwater to the MCL in this project area is intended to address this potential risk.

Previous Actions at the West-Cap and West Plume B Project Areas

The following cleanup work in the impacted WC & WPB vicinity has been completed:

- EPA installed groundwater monitoring wells at both the West-Cap and West Plume B Project Areas;
- EPA installed an interim groundwater extraction system and pipeline at the West-Cap project area (utilizing the Texas Instruments groundwater treatment plant); and
- EPA is designing the soil cleanup at the WC property and is conducting a pilot SVE study.

West-Cap and West Plume B Cleanup Alternatives Comparison					
Evaluation Criteria	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 3
		WEST-CAP	WEST PLUME B	WEST-CAP	WEST PLUME B
	NO ACTION	MONITORED NATURAL ATTENUATION	MONITORED NATURAL ATTENUATION	PUMP & TREAT (EPA'S PREFERRED ALTERNATIVE)	
Overall Protectiveness	○	◐	◐	●	●
Compliance with State and Federal Requirements	○	◐	◐	●	●
Long-term Effectiveness	○	◐	◐	●	●
Implementability	N/A	●	●	●	●
Short-term Effectiveness	N/A	◐	◐	●	●
Reduction of Toxicity, Mobility or Volume by Treatment	○	◐	◐	●	●
Estimated Present Worth Cost	\$0	\$2.1 M	\$2.0 M	\$5.5 - 6.4 M	\$5 - 5.5 M
State Agency Acceptance	ADEQ's acceptance of the EPA preferred remedy is pending.				
Community Acceptance	Community acceptance of the preferred alternatives will be evaluated after the public comment period.				
● = Fully meets criterion ◐ = Partially meets criterion ○ = Does not meet criterion					



Table 2: Comparison of Cleanup Alternatives

Remedial Action Objectives

EPA's specific objectives for the actions considered in this Proposed Plan are to:

1. Protect human health by minimizing the potential for human exposure to groundwater which has contaminant concentrations exceeding levels of concern (i.e., MCLs);
2. Cost-effectively reduce contamination in groundwater to concentrations that meet cleanup goals;
3. Protect groundwater resources by preventing or reducing migration of groundwater contamination above MCLs

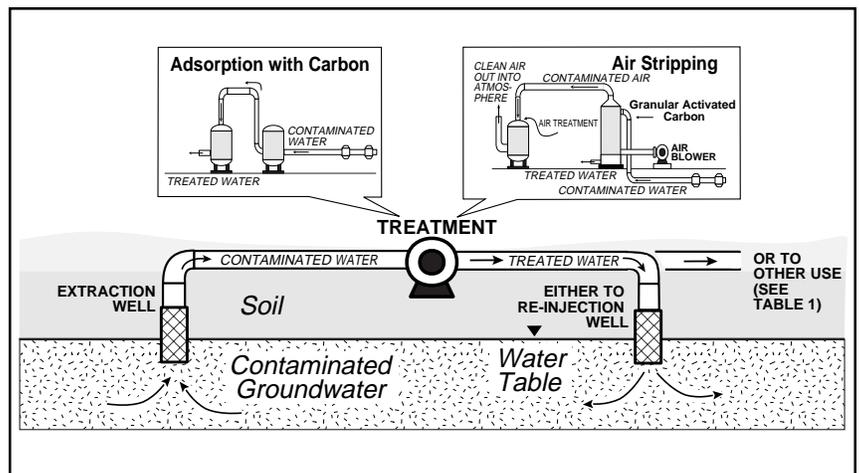


Figure 4: Groundwater Pump & Treat Options

Summary of Remedial Alternatives

Alternative 1 is the No Action alternative. Alternative 2 is treatment by monitored natural attenuation. Alternative 3 is groundwater extraction and treatment in which EPA will consider the specific details. Alternatives 2 and 3 both include community notification of the presence of contamination and groundwater monitoring.

Several potential remedies were rejected early in the FS development because they were found to be infeasible. They include in-situ chemical treatment via injection of hydrogen/oxygen-reducing compounds, potassium permanganate or molasses and in-situ air sparging.

Cleanup Alternatives

Alternative 1: No Action. EPA is required to compare a no-action alternative to any active cleanup technology under consideration. In the No Action alternative, no remedial activities or monitoring activities would be implemented. Alternative 1 is not protective, and thus fails to meet EPA's threshold criteria. As a result, Alternative 1 is not evaluated further.

Alternative 2: Monitored Natural Attenuation. Alternative 2 uses natural processes to change the concentration or physical structure of contaminants into less harmful forms. Alternative 2 also uses long-term, annual groundwater monitoring to verify the effectiveness of the natural attenuation processes. Additional monitoring wells would be added and community notification would be used to minimize human exposure while the remedy is in place.

Alternative 3: Groundwater Extraction and Treatment - This is EPA's preferred alternative

Alternative 3 is groundwater pumping and treatment in conjunction with monitoring. The general components of a pump and treat system include extraction wells, treatment system, end-use/discharge options, monitoring and community notification (see Figure 4, page 6). The selection of specific components of Alternative 3 for each of the Project Areas such as treatment system location, treatment type and water end uses during the design phase (see Table 1, page 5) will be determined during the Remedial Design/Remedial Action (RD/RA) phase.

For the WC Project Area, Alternative 3 consists of enhancement and expansion of the extraction well system presently in operation there. The existing system uses three extraction wells to convey contaminated water to the nearby TI air stripping treatment facility. EPA is considering either installation of a new air stripping system or carbon unit or the continued use of the TI treatment system. Two additional Upper Subunit wells would be added to the existing monitor well network at the WC Project Area.

At the WPB Project Area, EPA is considering either installing a new treatment system or the using the TARP treatment system. Two Upper Subunit monitoring wells would be added to the existing West Plume B Project Area network.

The various combinations of extraction, treatment and discharge options are further described in Table 1.

To select the remedy, EPA uses the nine criteria shown in Figure 2 (see page 3) to compare the different remediation alternatives. Based on EPA's evaluation of the alternatives against the criteria (see Table 2, page 6), EPA prefers **Alternative 3 (Pump and Treat)**. EPA believes that Alternative 3 best meets the threshold criteria and provides the best balance among the alternatives. Specifically, EPA expects Alternative 3 will: (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost effective; (4) utilize permanent solutions to the maximum extent practicable; and (5) satisfy the preference for treatment.

The preferred alternative may change in response to public comments and new information.

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For More Information

If you have questions or comments regarding the Tucson International Airport Area Superfund Site, please contact:

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You may also call EPA's toll-free Superfund hotline and leave a message that will be forwarded to the appropriate EPA staff. The hotline number is **1-800-231-3075**.

Site Repository

El Pueblo Library
101 W. Irvington Rd.
Tucson, AZ 85714
(520) 791-4733

Hours: Mon, Tues: 9 a.m. - 6 p.m.
Wed, Thurs: 10 a.m. - 6 p.m.
Friday: 10 a.m. - 5 p.m.

EPA Superfund RecordsCenter
95 Hawthorne St., 4th Floor
San Francisco, CA 94105
(415) 536-2000

Hours: Mon-Fri : 8 a.m. - 5 p.m.

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