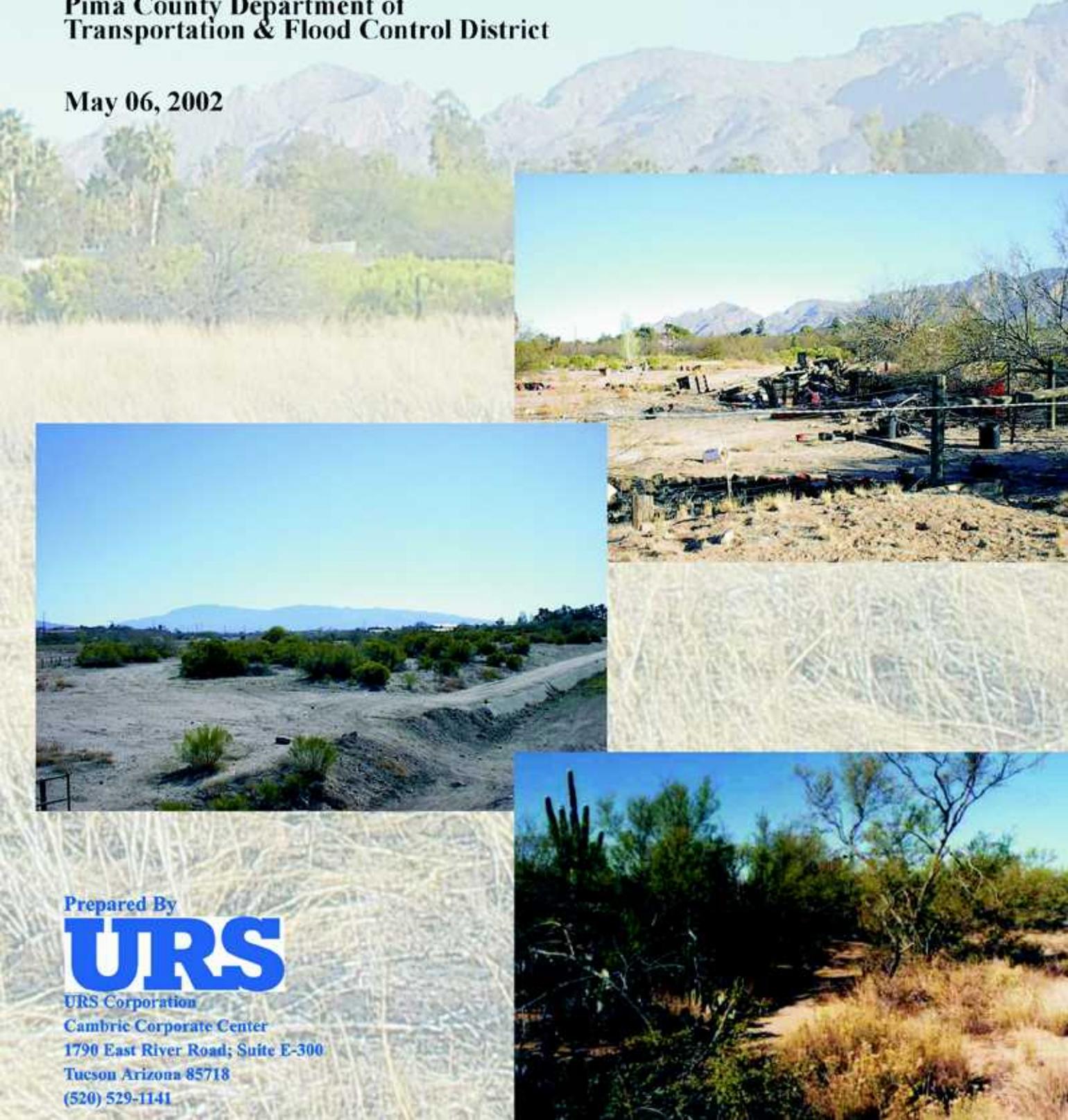


**FINAL REPORT  
HTRW FRAMEWORK RESEARCH**  
In Support of  
**FEASIBILITY STUDY** for the  
**EL RIO ANTIGUO  
ECOSYSTEM RESTORATION PROJECT**

Prepared For  
**Pima County Department of  
Transportation & Flood Control District**

**May 06, 2002**



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## EXECUTIVE SUMMARY

URS Corporation (URS) conducted Hazardous, Toxic, and Radioactive Waste (HTRW) Framework Research for the Pima County Department of Transportation and Flood Control District (PCDOT&FCD) of a four-mile section of the Rillito Creek and surrounding land between Craycroft Road and Campbell Avenue in North Central Tucson, Arizona (Figure 1). The investigation is part of the United States Army Corp of Engineers (USACE) Feasibility Study for the proposed El Rio Antiguo Ecosystem Restoration Project. The work was performed under the existing contract between URS and the PCDOT&FCD (Contract # 16-04-U-130162-1001).

The HTRW Framework Research was conducted as a screening level assessment to summarize HTRW occurrences within and near the project area. Existing and past land use was evaluated, based on a review of the historical records and other public documentation, to evaluate the potential presence of HTRW sites in and around the Study Area (Figure 2).

URS followed selected guidelines of American Society of Testing and Materials (ASTM) Standard 1527 to identify properties with the potential presence of Recognized Environmental Conditions (RECs). The HTRW Framework Research is not intended to constitute an ASTM Phase I Environmental Site Assessment (ESA), rather it is a screening process to narrow the number of parcels within the Study Area for which further ESA would be recommended. Thus, URS identified parcels or groups of parcels for which potential RECs exist based on our review of published reports, regulatory database, limited review of local records and limited site reconnaissance. URS did not conduct interviews with property owners or occupants, review City of Tucson Fire Department Records, sewer records, or building permits, or conduct detailed field reconnaissance of individual properties.

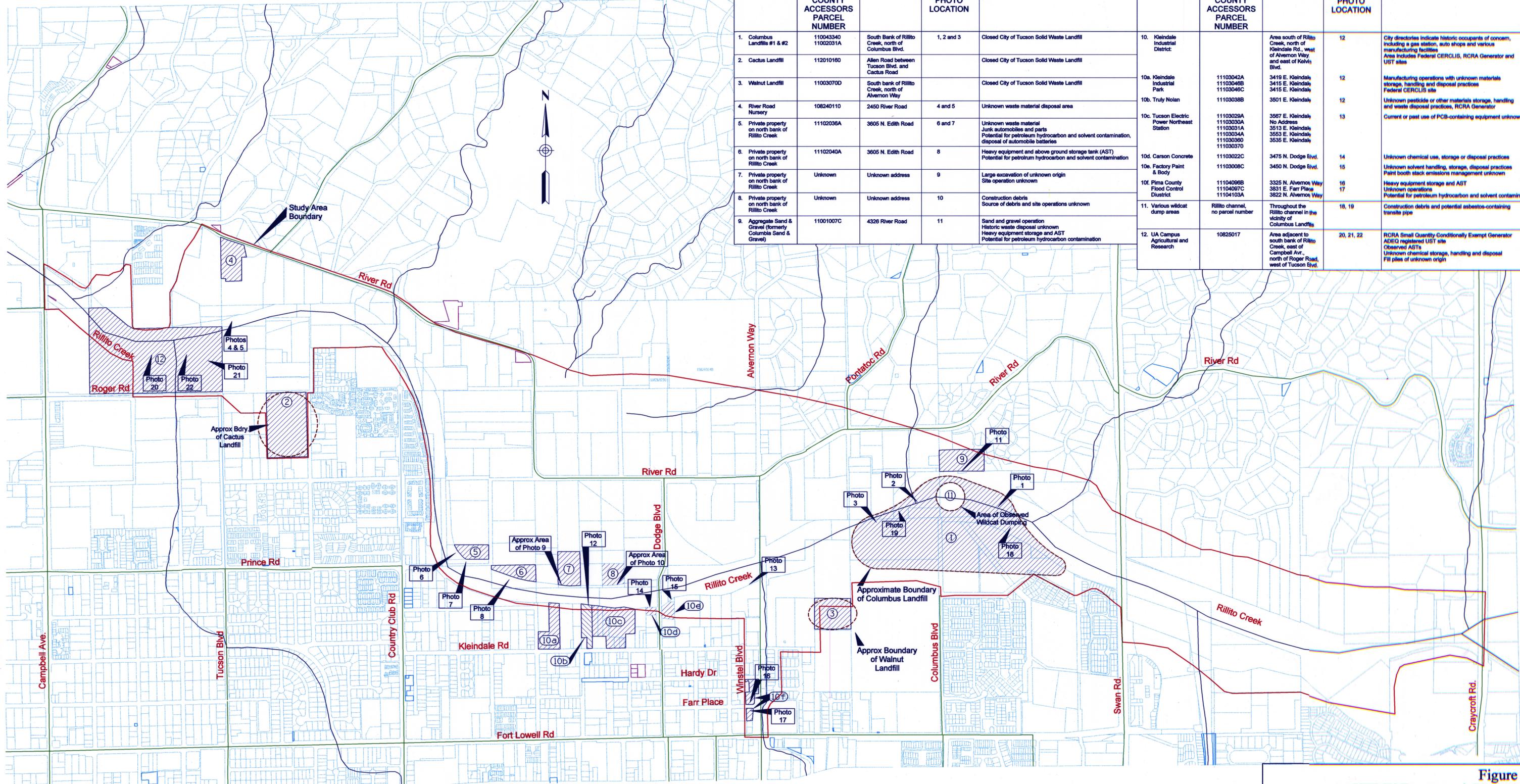
The information collected during the HTRW Framework Research was evaluated with respect to known or suspect environmental conditions. For the purposes of this study, properties with visual or historical evidence of HTRW storage or disposal; properties listed in the regulatory environmental databases with one or more recorded releases of hazardous materials; or properties with current or historical operations known to be associated with use, storage or disposal of HTRW were determined to have potential RECs. Further investigation in accordance with the remaining components of ASTM Standard 1527 is needed to document RECs at properties identified during this initial screening phase of work.

The results of the HTRW Framework Research indicated twelve areas within the Study Area with significant findings warranting further investigation. These areas include three closed solid waste landfills, scattered “wildcat dumps”, properties within an area described as the Kleindale Industrial district, the University of Arizona (U of A) Campus Agricultural Center, and six commercial and private properties located along the north bank of Rillito Creek (Figure 2).

Potential contaminants of concern identified during the HTRW Framework Research investigation included solvents, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), pesticides, metals and asbestos. URS recommends that Phase I ESAs be conducted for properties identified in each of the areas listed above in order to determine whether RECs are present, and if so, to evaluate the potential impacts of any contamination in the absence of response actions.

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Properties of Concern El Rio Antiquo Study Area					Properties of Concern El Rio Antiquo Study Area				
SITE ID	PIMA COUNTY ACCESSORS PARCEL NUMBER	LOCATION	FIGURE 2 PHOTO LOCATION	CONCERN	SITE ID	PIMA COUNTY ACCESSORS PARCEL NUMBER	LOCATION	FIGURE 2 PHOTO LOCATION	CONCERN
1. Columbus Landfills #1 & #2	110043340 11002031A	South Bank of Rillito Creek, north of Columbus Blvd.	1, 2 and 3	Closed City of Tucson Solid Waste Landfill	10. Kleindale Industrial District		Area south of Rillito Creek, north of Kleindale Rd., west of Alvernon Way and east of Kelvin Blvd.	12	City directories indicate historic occupants of concern, including a gas station, auto shops and various manufacturing facilities. Area includes Federal CERCLIS, RCRA Generator and UST area.
2. Cactus Landfill	112010180	Allen Road between Tucson Blvd. and Cactus Road		Closed City of Tucson Solid Waste Landfill	10a. Kleindale Industrial Park	11103042A 11103046B 11103046C	3419 E. Kleindale 3415 E. Kleindale 3415 E. Kleindale	12	Manufacturing operations with unknown materials storage, handling and disposal practices. Federal CERCLIS site.
3. Walnut Landfill	11003070D	South bank of Rillito Creek, north of Alvernon Way		Closed City of Tucson Solid Waste Landfill	10b. Truly Noian	11103038B	3501 E. Kleindale	12	Unknown pesticide or other materials storage, handling and waste disposal practices, RCRA Generator.
4. River Road Nursery	108240110	2450 River Road	4 and 5	Unknown waste material disposal area	10c. Tucson Electric Power Northeast Station	11103029A 11103030A 11103031A 11103034A 111030360 111030370	3567 E. Kleindale No Address 3513 E. Kleindale 3553 E. Kleindale 3535 E. Kleindale	13	Current or past use of PCB-containing equipment unknown.
5. Private property on north bank of Rillito Creek	11102036A	3605 N. Edith Road	6 and 7	Unknown waste material. Junk automobiles and parts. Potential for petroleum hydrocarbon and solvent contamination, disposal of automobile batteries.	10d. Carson Concrete	11103022C	3475 N. Dodge Blvd.	14	Unknown chemical use, storage or disposal practices.
6. Private property on north bank of Rillito Creek	11102040A	3605 N. Edith Road	8	Heavy equipment and above ground storage tank (AST). Potential for petroleum hydrocarbon and solvent contamination.	10e. Factory Paint & Body	11103008C	3450 N. Dodge Blvd.	15	Unknown solvent handling, storage, disposal practices. Paint booth stack emissions management unknown.
7. Private property on north bank of Rillito Creek	Unknown	Unknown address	9	Large excavation of unknown origin. Site operation unknown.	10f. Pima County Flood Control District	11104096B 11104097C 11104103A	3325 N. Alvernon Way 3831 E. Farr Place 3822 N. Alvernon Way	16 17	Heavy equipment storage and AST. Unknown operations. Potential for petroleum hydrocarbon and solvent contamination.
8. Private property on north bank of Rillito Creek	Unknown	Unknown address	10	Construction debris. Source of debris and site operations unknown.	11. Various wildcat dump areas	Rillito channel, no parcel number	Throughout the Rillito channel in the vicinity of Columbus Landfills.	16, 19	Construction debris and potential asbestos-containing transite pipe.
9. Aggregate Sand & Gravel (formerly Columbia Sand & Gravel)	11001007C	4326 River Road	11	Sand and gravel operation. Historic waste disposal unknown. Heavy equipment storage and AST. Potential for petroleum hydrocarbon contamination.	12. UA Campus Agricultural and Research	10825017	Area adjacent to south bank of Rillito Creek, east of Campbell Av., north of Roger Road, west of Tucson Blvd.	20, 21, 22	RCRA Small Quantity Conditionally Exempt Generator ANDRO regulated UST site. Observed AST's. Unknown chemical storage, handling and disposal. Fill piles of unknown origin.

Figure 2  
 HTRW Framework Research  
 URS Project E2-00002096.00  
 URS Project No. E2-00002096.00 May 06, 2002

Scale: 1" = 4000'



FEASIBILITY STUDY – EL RIO ANTIGUO ECOSYSTEM RESTORATION PROJECT

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## 1.0 INTRODUCTION

URS Corporation (URS) was retained to conduct Hazardous, Toxic, and Radioactive Waste (HTRW) Framework Research (JF001) for the Pima County Department of Transportation and Flood Control District (PCDOT&FCD). URS understands that the United States Army Corp of Engineers (USACE) is currently conducting a Feasibility Study for the proposed El Rio Antiguo Ecosystem Restoration Project. The USACE has requested PCDOT&FCD provide the HTRW Framework Research for the Feasibility Study. The El Rio Antiguo Ecosystem Restoration Project area includes a four-mile section of the Rillito Creek and surrounding land, between Craycroft Road, and Campbell Avenue, in North Central Tucson, Arizona (Figure 1). The work was performed under the existing contract between URS and the PCDOT&FCD (Contract # 16-04-U-130162-1001).

### 1.1 OBJECTIVES

The primary objectives of the Framework Research are: to provide a screening level assessment to summarize the HTRW occurrences within and nearby the project area ; to identify potential RECs associated with individual properties; and, to identify those properties requiring more detailed investigations. Specifically, this process is intended to develop sufficient information from which a professional opinion could be made with respect to the potential for a release of HTRW substances to a property and to identify areas requiring further investigation.

### 1.2 METHODS

URS has prepared this HTRW Framework Research using guidelines established by USACE, as well as in the American Society for Testing and Materials (ASTM) Standard for Phase I Environmental Site Assessments (Standard Designation E 1527-00). The USACE has defined the Feasibility – HTRW Studies/Report as follows:

A report summarizing the hazardous/toxic/radiological waste (HTRW) occurrences within and nearby the project area. It includes a determination of the nature and extent of contamination and a qualitative analysis of the impacts of any contamination in the absence of response actions. It also includes a preliminary identification of potential source areas, contaminant release mechanisms, exposure routes, potentially exposed populations, as well as a determination of the non-numerical risk or potential adverse health effects for the identified potential receptors, and an evaluation of the environmental consequences of all storage, use

generation, and disposal on the property. (USACE, Civil Works Breakdown Structure Definitions; 30, November 1993 draft, pp. 13 &14).

In addition to summarizing existing, published information as described in JF001, the Framework Research was conducted to identify potential Recognized Environmental Conditions (RECs) associated with the properties located in and near the El Rio Antiguo project area. ASTM defines RECs as the presence or likely presence of hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property.

The method of research primarily consisted of gathering and evaluating existing published information for specific properties within the Study Area. Additionally, a preliminary site reconnaissance was conducted to identify potential source areas and to provide additional data to assist with the preliminary determination of potential adverse impact to potential areas of concern.

Historical data was collected from various government and private sources including the U.S. Environmental Protection Agency (EPA), Arizona Department of Environmental Quality (ADEQ), Pima County Assessor's Office, City of Tucson telephone directories, aerial photographs, and the Arizona Department of Water Resources (ADWR). This data was reviewed to assess historical operations and to identify properties of concern within the Study Area.

### 1.3 LIMITING CONDITIONS

Our site visit included a reconnaissance of areas that were accessible by foot and a drive-by inspection of surrounding and adjacent properties. Parcels that were not accessible were evaluated from public right-of-way areas.

The HTRW Framework Research was limited to components of ASTM Standard 1527 agreed upon by URS and PCDOT&FCD. These were a limited record search, regulatory database update, review of selected literature, and a limited site reconnaissance. URS did not conduct interviews with property owners or occupants, review City of Tucson Fire Department Records, sewer records, or building permits, or conduct detailed field reconnaissance of individual properties.

The conclusions presented in this report are professional opinions based solely upon our visual observations of the Study Area and the immediate site vicinity, and upon our interpretations of the readily available historical information, conversations with personnel knowledgeable about the site, and other readily available information, as referenced in the report. These conclusions

are intended exclusively for the purpose stated herein, at the site indicated, and for the project indicated.

This study was not intended to be a definitive investigation of possible contamination at the subject property. The purpose and scope of this investigation was to determine if there is reason to suspect the possibility of contamination at the site. No exploratory borings, soil or groundwater sampling, or laboratory analyses were performed at the property and, therefore, the conclusions set forth herein are made without the benefit of such investigation.

## 2.0 AREA OVERVIEW

Historic and current information concerning the Study Area is based on a review of readily available published information and a limited site reconnaissance.

### 2.1 AREA LOCATION

The El Rio Antiguo Study Area is located in north central Tucson, Arizona (Figure 1). The irregularly shaped Study Area, which includes the Rillito Creek channel and the 100-year floodplain, is bounded approximately by East River Road on the north, Craycroft Avenue on the east, Fort Lowell Road on the south, and Campbell Avenue on the west (Figure 2). The area includes portions of Sections 20, 21, 26, 27, 28 and 29, Township 13 South, Range 14 East of the Gila and Salt River Base and Meridian, Pima County, Arizona.

### 2.2 PROPERTY DESCRIPTION AND USE

PCDOT&FCD owns most of the land within the Rillito Creek and Alamo Wash channels; land outside of the channels is primarily privately owned. Property use within the Study Area includes commercial, light industrial and residential. Over 250 Pima County Assessor parcels were screened within the Study Area (Figure 2). Some of these parcels have more than one address or occupant. URS evaluated current and historic occupants within the Study Area by researching street addresses at five-year intervals in City of Tucson telephone directories and historic activities by reviewing aerial photographs. The results of the directory search and the results of the aerial photograph review are described in Section 5.0, Records Review.

Prior to 1946, the Study Area was used for agricultural or residential purposes. In the late 1940s and early 1950s, development began in several areas as the city of Tucson started expanding to the north. A corridor along Kleindale Road between Alvernon Way and Kelvin Boulevard with offshoots north on Dodge Boulevard to the Rillito Creek and south on Alvernon Way to Fort Lowell Road developed as a light industrial/commercial area during this time. Much of the Study Area has remained as residential use. Properties north of Rillito Creek support small privately owned ranch and livestock operations. University of Arizona (U of A) agricultural and research facilities comprise the southwest corner of the Study Area.

Four closed solid waste landfills are located in or adjacent to the Study Area: the Columbus Landfill #1, the Columbus Landfill #2, the Walnut Landfill and the Cactus Landfill. These landfills, formerly operated by the City of Tucson, began as sand and gravel operations. In general, the landfills were active between 1960 and 1980. Landfill locations are shown on

Figure 2, Site Map. Figure 2 shows the Columbus Landfill #1 and #2 as one area, collectively labeled as the Columbus Landfill. Figure 3 shows the Columbus Landfill in more detail, and delineates the Columbus #1 and Columbus #2 Landfills.

### **2.3 ADJOINING AND SURROUNDING LAND USE**

The adjoining and surrounding land use is predominantly residential interspersed with commercial properties with some manufacturing or light industrial use. Additionally, the area includes U of A agricultural facilities and small private ranch and livestock operations. There are no heavy industrial areas near the Study Area.

### 3.0 PREVIOUS INVESTIGATIONS

URS reviewed reports summarizing the Rillito Creek groundwater recharge project, Columbus Landfill investigations and Rillito River right-of-way Environmental Assessment reports obtained from PCDOT&FCD. Findings obtained from our review are summarized below and in subsequent sections of this report.

#### 3.1 RECHARGE STUDIES

The U of A and the U.S. Geological Survey conducted preliminary studies of recharge possibilities in Rillito Creek as early as 1959 (PCDOT&FCD, 1996). In 1986, Pima County Board of Supervisors adopted the Rillito Creek-Alvernon to Craycroft Flood Storage/Groundwater Recharge Natural Riverine Preservation Project. An intergovernmental agreement between Pima County, the City of Tucson and Arizona Department of Water Resources was formed in 1987 to direct representative agency committee members in the overall goals and tasks of the Rillito Creek Recharge Project.

In 1986, the PCDOT&FCD proposed the Rillito Creek Recharge Project for partial funding under the High Plains Sites Ground Water Recharge Demonstration Program Act (the High Plains Program). The High Plains Program is administered on the Federal level by the Bureau of Reclamation (BOR) Arizona Projects Office and locally by PCDOT&FCD. Other Federal agencies participating in the High Plains Program for the Rillito Recharge Project have been the EPA, U.S. Geological Survey (USGS), and the U. S. Fish and Wildlife Service (USFWS).

The Rillito Recharge Feasibility Study was completed in 1990 (CDM, 1990). Following submittal of a Preliminary Design Report in 1992, the intergovernmental agreement expired leaving PCDOT&FCD as the sole local sponsor of the Rillito Creek Recharge Project. In 1995, PCDOT&FCD determined not to construct the Rillito Recharge Project (PCDOT&FCD, 1996).

Recent studies pertaining to Rillito Creek have included the project initiated in 1999 by the USGS entitled *The Development of Methods to Estimate Groundwater Recharge, Rillito Creek, Tucson Arizona*. The purpose of the study is to characterize the recharge process in Rillito Creek, estimate recharge benefits, and evaluate the potential for landfill contaminants to be transported into groundwater. URS has not reviewed a report summarizing the results of the USGS study referenced in the *Final Report Rillito Recharge Project* (PCDOT&FCD, 1996).

In summary, Rillito Creek has been studied by several government agencies for the feasibility of recharge to groundwater by direct impoundment. Local hydrologic and hydrogeologic conditions

have been identified. The results of these studies have indicated that impoundment of surface water in the Rillito Creek channel would enhance the natural infiltration of runoff water in an area where the demand for groundwater is high (PCDOT&FCD, 1996).

### 3.2 LANDFILL STUDIES

Concurrent to recharge feasibility studies, several investigations of landfills within the Study Area were initiated with respect to their potential to impact groundwater quality. The Pima Association of Governments (PAG) identified three abandoned landfills along Rillito Creek between Swan Road and Dodge Boulevard (Figure 2). All three, the Walnut Landfill, the Columbus 1 Landfill and the Columbus 2 Landfill, were operated by the City of Tucson intermittently from the 1960's through 1980's (PAG, 1989). A fourth landfill, the Cactus Landfill, was identified in or adjacent to the Study Area in the database search conducted for the HTRW Framework Research of the ADEQ Solid Waste Section Directory of Arizona Active and Inactive Landfills dated May 1999 (Appendix B). URS reviewed data from the database search and previous investigations to determine local groundwater conditions as discussed in Section 4.0 of this report, and to assess the potential impact of the closed landfills on soil and groundwater in and adjacent to the Study Area.

URS reviewed reports of soil gas surveys and groundwater monitoring conducted at three of the four closed landfills. The Walnut Landfill was included in an investigation of several landfills as part of the City of Tucson Landfill Environmental Studies Program (LESP) conducted by Dames & Moore (Dames & Moore, 1991). The site characteristics, design and historic operations of the Walnut Landfill, were evaluated. Conclusions of the study indicated that the Walnut Landfill has little potential for future groundwater contamination. According to the report, more studies are needed to determine the future impacts from methane.

Twenty-three soil gas sampling points were installed throughout the Walnut and Columbus Landfills as part of the Rillito Creek Recharge Feasibility Study. The results of the study indicated no Volatile Organic Compounds (VOCs) detected in soil had concentrations above background levels (Camp Dresser McGee, 1990). However, subsequent soil gas surveys have indicated reportedly high levels of methane gas in the vicinity of the Walnut Landfill (AJAY Environmental, 1993).

PAG initiated the Columbus Landfill study in 1998 to summarize existing information about Columbus Landfill and to assess whether there has been any evidence of groundwater contamination or landfill gas production at the site. PAG reviewed existing reports for information regarding the operational history of the landfill, water quality in the area, evidence

of landfill gas production, and the results of trenching investigations. The results of the PAG investigation are reported in the *Columbus Landfill Environmental Data Summary* report dated April 2000 (PAG, 2000). The report concluded that additional information is needed to define landfill boundaries and waste characteristics. Figure 3 is a map showing the known limits of the Columbus Landfill.

PAG also found in their review that although groundwater samples collected from wells directly downgradient from Columbus Landfill showed no evidence for groundwater contamination, most of the wells sampled were located greater than one-half mile from the Columbus Landfill area. Further, these wells pumped groundwater from depths greater than 100 feet, and did not tap water in the shallower aquifers (PAG, 2000). Therefore, the report recommended completion of additional shallow zone groundwater monitoring wells downgradient from Columbus Landfill, upgradient from Walnut Landfill. Existing wells in the vicinity of the Columbus Landfill are shown on Figure 4.

Studies reviewed by URS indicate that although there is little evidence of local groundwater contamination from the Columbus and Walnut landfills, additional monitoring wells and further sampling are needed to better define groundwater quality conditions and thus establish the potential for future groundwater contamination from the closed landfills. Studies also indicate that further soil gas monitoring is needed to evaluate the long-term impact of methane at the Walnut Landfill.

## 4.0 ENVIRONMENTAL SETTING

Environmental characteristics including topography, geology, and hydrogeology were evaluated based on site observations, published literature, and maps.

### 4.1 TOPOGRAPHY AND SURFACE HYDROLOGY

The elevation of the Study Area is approximately 2320 to 2400 feet above mean sea level with a topographic gradient of approximately 20 feet per mile to the west. The project area includes the channels of Rillito Creek, its 100-year floodplain and its tributary, Alamo Wash.

Rillito Creek is a principal tributary to the Santa Cruz River. The watershed of the Rillito Creek upstream of the Study Area (east of Craycroft Boulevard) is approximately 871 square miles (PCDOT&FCD, 1996). The Rillito watershed lies within the Tucson Basin and the Cienega Creek Basin. The Rillito Creek is ephemeral; the direction of surface water flow is west toward the Santa Cruz River.

According to Flood Insurance Rate Map Panels No. 040073-1640 D, 040073-1645 D, and 040073-1665 D, dated September 30, 1992, most of the Study Area is designated Zone AE, an area of 100-year flood, base flood elevations and flood hazards determined (FEMA, 1992).

### 4.2 GEOLOGY

The following section describes the regional geology of the surrounding area of interest and the specific geology of the Rio Antiguo Study Area.

#### 4.2.1 Regional Geology

The Study Area is located within the Tucson Basin. The Tucson Basin is a broad northwest-trending alluvial valley encompassing approximately 1,000 square miles and bounded by mountain ranges on the northeast, east, and west margins.

The aquifer underlying the Tucson Basin consists of three primary water-bearing units. These units, in descending stratigraphic order, are the Quaternary Fort Lowell Formation, the Tertiary Tinaja beds, and the Tertiary Pantano Formation. Quaternary surficial deposits overlie these formations. These surficial deposits are typically gravel and gravelly sand with local sand and sandy silt, and range in thickness from a thin veneer to tens of feet. The surficial deposits are not hydrologically significant because the water table is below these deposits in most of the Tucson

Basin. The alluvium along some reaches of Rillito Creek and smaller tributaries is saturated and receives and temporarily stores recharge from floodflows (Davidson, 1973).

The Fort Lowell Formation is composed of gravel near the basin margins and grades to silt near the center. The formation ranges in thickness from 300 to 400 feet, thinning toward the basin margins (Davidson, 1973). The Fort Lowell Formation is unconformably overlain by recent alluvium throughout most of the basin, especially along stream channels (Davidson, 1973). The groundwater table is within this unit at the Study Area (PCDOT&FCD, 2000).

The Tinaja beds rest unconformably below the Fort Lowell Formation and are composed of gravel and sand grading to a very thick sequence of gypsiferous clayey silt and mudstone toward the center of the basin (Davidson, 1973). These beds were deposited in an internally draining basin and are estimated to be several thousand feet thick near the center (Davidson, 1973). The Tinaja beds are divided into the upper, middle, and lower Tinaja. The upper Tinaja beds consist predominantly of sand and clayey silt in the central basin, and sand and gravel proximate to the mountains. The middle Tinaja beds consist of gypsiferous and anhydritic clayey silt and mudstone; the lower Tinaja beds consist of silty gravel and conglomerate.

The Pantano Formation lies unconformably under the Tinaja beds. The Pantano Formation is composed of conglomerate, sandstone, mudstone, and gypsiferous mudstone; the sediments are occasionally interbedded with volcanic flows and tuffs, and locally contain landslide debris and lenses of megabreccia. Sediments of the formation are as much as thousands of feet thick (Anderson, 1987). Sediments of the Pantano crop out close to the edges of the basin; a well in the central part of the basin indicates that the Pantano is buried by more than 8,000 feet of younger rocks and sediments along the central axis of the basin. However, between the central part of the basin and the edges of the basin the depth of the contact between the Pantano and younger rocks and sediments is uncertain because few wells penetrate into the Pantano (Anderson, 1987).

#### 4.2.2 Site Geology

Site geologic conditions were described in the *Final Report Rillito Recharge Project* (PCDOT&FCD, 1990). Alluvial deposits underlying the Study Area are comprised of recent stream channel and floodplain deposits; typically including gravel and sand within the stream channel and sandy silt in low-lying terraces. The recent alluvial deposits in the vicinity of the Study Area range in thickness from 40 to 80 feet (PCDOT&FCD, 1996). The Pleistocene units of the Fort Lowell Formation underlie the more recent alluvial deposits.

### 4.3 HYDROGEOLOGY

The following sections describe the hydrogeology of the Study Area and vicinity. The site-specific hydrogeology was evaluated through a review of recent and historical groundwater data, and review of previous investigations completed for the Rillito River Recharge Project.

#### 4.3.1 Regional Hydrogeology

The regional aquifer consists of alluvium that is divided into Upper, Middle, and Lower Basin Fill hydrostratigraphic units. The Upper Basin Fill is generally equivalent to the Recent Alluvium, the Fort Lowell Formation, and the uppermost upper Tinaja beds. The Middle Basin fill is generally equivalent to the lowermost upper Tinaja. The Lower Basin Fill is equivalent to the Pantano Formation, lower Tinaja beds, and middle Tinaja beds. In general, sediments of the Lower Basin Fill are less transmissive than sediments of the Upper Basin Fill, but the Lower Basin Fill stores a greater volume of water than the Upper Basin Fill because of its greater thickness (Hanson and Benedict, 1994). The Precambrian intrusive and metamorphic rocks act as a lower confining unit for the Tucson Basin. Groundwater flow within the Tucson Basin is generally to the north-northwest. The aquifer is generally unconfined to depths of 1,500 feet.

Inflows to the regional aquifer occur as 1) groundwater underflow from the northeast, south, and southeast, 2) mountain-front recharge, and 3) natural infiltration along stream channels. Davidson (1973) reported that average annual inflow into the entire Tucson Basin was about 100,000 acre-feet; underflow to the basin was about 17,800 acre-feet, mountain front recharge was about 31,000 acre-feet, and stream channel infiltration was about 51,000 acre-feet.

Outflows from the Tucson Basin occur as well pumpage, evapotranspiration, and groundwater underflow to the northwest. Groundwater withdrawals for industrial, irrigation, and municipal supply in the Tucson Basin increased from the 1930s to present, and since the 1940s exceed natural recharge and underflow into the basin. As a result of this overdraft, significant groundwater level declines have been observed within the basin. For example, the COT reported declines for the CWF of up to 200 feet between 1950 and 1995, with declines in some areas averaging up to four to five feet per year (ADWR, 1999).

Movement and storage of groundwater are controlled by the distribution of hydraulic head and by the transmissive and storage properties of the regional aquifer. Hydraulic properties in the basin vary aerially and vertically depending on lithologic factors such as grain size, sorting, and cementation (Hanson and Benedict, 1994).

### 4.3.2 Site Hydrogeology

Site specific hydrogeologic information has been obtained from published reports and well records. The Study Area is within the Tucson Active Management Area (AMA). Depth to the regional groundwater was approximately 50 to 100 feet below ground surface (bgs) during the Period of November 1998 to February 1999 (Tucson Water, 1998). The direction of regional groundwater flow was to the southwest beneath the property.

Previous studies of site conditions in the vicinity of Columbus Landfill indicated groundwater flow was generally toward the south to southwest. Figure 4 shows well locations in the vicinity of Columbus Landfill. Depths to water near the landfill were reported to be between 10 to 40 feet bgs near the river and 116 feet bgs at the Christopher City well, approximately 1/2 mile south of the landfill (PAG, 2000). Variability of local groundwater levels may be in response to mounding of groundwater from recharge in Rillito Creek and localized pumping conditions.

PAG and others (Tucson Water, ADWR, and USGS) have collected groundwater quality data in the vicinity of the Columbia and Walnut Landfills since the mid-1980s. Samples were analyzed for priority pollutants and common ion indicator parameters. Priority pollutants and organochlorine pesticides were not detected in 1994 quarterly sampling conducted by USGS in the vicinity of the Columbus Landfill. In summary, groundwater contamination has not been found close to, or downgradient of the Columbus Landfill (PAG, 2000).

Arizona Department of Water Resources Well Operation Division Report dated March 2000 was searched within a 10-acre radius of the Study Area by All Lands (AL). Within the radius, 315 registered wells were listed (Appendix C). A summary of the well data reviewed by URS is in Section 6.3 of this report.

## 5.0 RECORDS REVIEW

Parcels were assessed by review of historical records and federal, state and local agency records. Historical data was collected from various government and private sources including the EPA, ADEQ, Pima County Assessor's Office, City of Tucson telephone directories, Tucson Water records, aerial photographs, and the ADWR.

Six aerial photographs, ranging in date from 1954 through 1998, were reviewed for the Study Area. Additional historic information for properties was obtained through review of information provided by PCDOT&FCD. Historical city directories were also reviewed from 1920 to present at five-year intervals.

### 5.1 AERIAL PHOTOGRAPH REVIEW

URS reviewed readily available aerial photographs of the Study Area. Available photographs included 1954, 1980, 1983, 1984, 1990, and 1998. Aerial photographs were reviewed at PCDOT&FCD Technical Services Engineering Information Management.

The 1954 photograph shows the Study Area with the exception of the Easternmost ½-mile between Swan Road and Craycroft Road, which was not included in the coverage. The Study Area consisted of mainly agricultural activities, ranches and other scattered residential properties. There appears to be a large amount of vacant land with native desert vegetative cover and a few residential properties north of the Rillito Creek. The Columbus Landfill area appears to be farmland in the 1954 photograph. The areas of the Cactus and Walnut Landfills are vacant in the 1954 photograph.

The 1980, 1983 and 1984 aerial photographs are similar. Development on the north side of the Rillito Creek has expanded. An apartment complex has been built near the intersection of Campbell Avenue and River Road. There continues to be scattered housing and ranches north of the river. The Tucson Racquet Club is visible in these photos. The Columbus Landfill is visible but appeared covered with soil in the photos. Similarly, the Walnut and Cactus landfills do not appear active. A mixed industrial/commercial area appears to be located along Kleindale between Alvernon Way and Kelvin Boulevard. This area also appears to extend south on the west side of Alvernon Way to Fort Lowell Road. Possible aboveground storage tanks (ASTs) were located on the west side of Alvernon Way one block north of Fort Lowell Road. The Tucson Electric Power North East Substation is located along the river just west of Dodge Boulevard. Between Swan Road and Craycroft Road is open desert land and scattered housing.

The 1990 and 1998 aerial photos were also very similar. The auto body paint shop located just south of the Rillito Creek and Dodge Road intersection is visible. Concrete bridge debris was also visible at the Columbus Landfill. The remaining area shows increased residential properties and less open desert land. The light industrial/commercial area around Kleindale Road appears much the same as in the 1984 photographs.

## 5.2 LOCAL RECORDS REVIEW

Directories listing business names or residents for each addressed property from 1920 are available from the Tucson library. These directories include City of Tucson Directory, Coles, and Polk's listings. Although these directories extend back to the early 1900s, listings for the Study Area were not found prior to 1946. Each directory was reviewed for addresses within the ranges presented below. Many side streets were located in the areas of the major roads listed above and were reviewed as part of the process.

- 1900-5500 East River Road
- 3200-4000 North Alvernon Way
- 3000-3500 North Craycroft Road
- 3400-3800 North Dodge Boulevard
- 3000-3500 North Swan Road

Addresses in these ranges for the applicable year are summarized in the table presented in Appendix D. The table includes year of entry, address, and name of the property owner or occupant.

## 6.0 ENVIRONMENTAL DATABASE

URS reviewed information gathered from several environmental databases through AL to evaluate whether activities on or near the Study Area have the potential to create a REC on the properties within the Study Area. AL reviews databases compiled by federal, state, and local governmental agencies. AL does not assume responsibility for errors in the available records. URS does not verify the databases reported by AL. Databases were searched to a one-mile radius of the perimeter of the Study Area.

### 6.1 FEDERAL REGULATORY AGENCY DATABASES

Federal compliance records that are searched in accordance to ASTM Standard E 1527-00 include: the National Priorities List (NPL or Superfund), the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List, the Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal (TSD) Facilities lists (including those facilities (CORRACTS) with corrective action against them by the U.S. Environmental Protection Agency (EPA), the RCRA generators lists, and the Emergency Response Notification System (ERNS). The findings, as presented by AL, are summarized below. Details of the search are Appendix B.

- No NPL records were identified for the Study Area or within the 1-mile radius.
- One Federal CERCLIS site was found within the ½ mile ASTM search radius of the Study Area. The site is listed as Kleindale Industrial Park, with the address of 3434 E. Kleindale. The north portion of the facility is within the Study Area Boundary.
- There are four RCRA generators within or adjacent to the Study Area boundary. RCRA generators are: Larry's Paint & Body at 3420 N. Dodge Blvd; Truly Nolan Pest Control at 3509 E. Kleindale Rd.; Arizona Metal Finishing at 3801 E. Kleindale Rd.; and U of A Campus Agricultural Center at 4101 N. Campbell Ave. All four are conditionally exempt small quantity generators (less than 100 kilograms per month).
- There are two RCRA Compliance Facilities within a 1-mile search radius of the Study Area boundary. These are facilities that have been or presently are under investigation for non-compliance problems and RCRA regulatory violations. The two facilities, which are outside the boundaries of the Study Area, are Sparkle Cleaners at 5635 East River Rd. and Jensen's West at 1280 E. Prince Rd. T

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- There are no RCRA TSD facilities within the ½-mile search distance of the Study Area boundary. There are no RCRA TSD facilities with corrective action within 1 mile and no RCRA generators within 1/8 mile of the Study Area boundary.
- There are no ERNS entries listed in the database for the vicinity of the Study Area.

**6.2 STATE REGULATORY AGENCY DATABASES**

Information included in the state environmental records are the State of Arizona equivalent to NPL or “Superfund,” identified as WQARF; Arizona CERCLIS information and data system (Arizona Superfund, formerly ACIDS), Arizona solid waste facilities, registered underground storage tanks (USTs), and reported leaking underground storage tanks (LUSTs); hazardous incident reports; ADWR well registry; ADEQ Dry Well Database and records of Environmental Permits. Detailed information is in Appendix B. The findings are summarized as follows:

- There are no WQARF Registry List Sites within a 1-mile search radius of the Study Area Boundary.
- The Study Area is not on the state emergency log of hazardous materials incidents. There are no facilities on the state spills list within a 1-mile radius.
- There are no State Superfund sites (formerly ACIDS) listed within a ½-mile radius.
- There are twelve listed sites with registered USTs within or adjacent to the Study Area. UST sites, site owners and addresses and tank information are as follows:

**TABLE 6.1 UST INFORMATION**

ID	FACILITY	ADDRESS	TANK INFORMATION (tank size in gallons, contents)
0-000977	Catalina Foothills School Bus Yard	2101 E River Rd	1) 12,000 diesel 2) 500 diesel
0-001245	Tosco Circle K # 517	3155 N. Alvernon	1) 10,000 gasoline (removed) 2) 10,000 gasoline (removed) 3) 10,000 gasoline 4) 10,000 gasoline 5) 10,000 gasoline
0-004113	Rayne Soft Water Service	3311 N. Chapel	1) 2,000 gasoline (removed)
0-006571	Pima County Automotive Service	3390 N. Richey	1) 12,000 diesel (removed) 2) 10,000 gasoline (removed) 3) 6,000 gasoline (removed) 4) 15,000 gasoline 5) 15,000 diesel
0-007397	Attorney John Ross	3420 N. Dodge	1) 1,000 gasoline (removed) 2) 1,000 gasoline (removed) 3) 1,000 gasoline (removed)
0-003134	Merit Builders	3428 E. Kleindale	1) 1,000 gasoline (removed)

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ID	FACILITY	ADDRESS	TANK INFORMATION (tank size in gallons, contents)
0-002855	Kleindale Assoc.	3442 E. Kleindale	1) 1,500 gasoline (removed) 2) 1,500 diesel (removed)
0-006757	Performance Unlimited	3721 E. Hardy	1) 1,100 gasoline (removed)
0-003307	Morey Excavating	3825 E. Hardy	1) 1,000 gasoline (removed) 2) 500 diesel (removed)
0-004698	Reiner Concrete/SW Concrete	3832 E Farr Pl	1) 2,000 gasoline (removed) 2) 500 diesel (removed) 3) 500 waste oil (removed)
0-005397	Campus Agriculture Center	4101 N. Campbell	1) 2,000 gasoline (removed) 2) 2,000 gasoline (removed) 3) 2,000 diesel (removed)

- There are 12 LUST facilities with 19 recorded releases within a ½-mile radius of the Study Area. Of these, thirteen release files are closed. Twelve of the closed files have been assigned State Priority Code 5R1, indicating those soil concentrations meet State clean-up levels. The other closed file has been assigned Priority Code 7, indicating that the LUST case close-out involved combination with other LUST cases (two 5R1) at the same facility.

Two LUST facilities within the search distance have open LUST files: the Merit Builders facility at 3428 E Kleindale and the Texaco #60 at 3050 Fort Lowell. The one release at Merit Builders has been assigned Priority Code 2, indicating undefined soil contamination. Priority code 2 is also default for newly reported LUSTs. There are five open LUST files at the Texaco #60, all of which have been assigned Priority Code 2. Neither of the sites with open LUST files are within the Study Area. Merit Builders is located on E. Kleindale approximately 0.8-mile south of the Study Area boundary. The Texaco # 60 is located at the intersection of Fort Lowell and Country Club, approximately 0.5-mile south of the Study Area boundary (Appendix B).

- Four landfills are listed in the State database within a ½-mile radius of the subject property. Three of the landfills are located along the Rillito Creek within the Study Area: the Columbus #1 and #2 Solid Waste Landfills and the Walnut Solid Waste Landfill. More information is needed to determine whether the fourth listed landfill, the Cactus Solid Waste Landfill, is located within the boundaries of the Study Area. The locations of all four landfills are shown on Figure 2, Site Map.
- There are no SARA Title III facilities within 1 mile of the subject property.
- The ADEQ dry well registry database includes one dry well within or adjacent to the Study Area. The dry well, registry number 4803, is located at St. Phillips Plaza on the southeast corner of the intersection of River Road and Campbell Avenue (Figure 2, Site Map). It is outside the Study Area boundaries.

- The properties within the Study Area are not included on the State lists of Groundwater Permits; Reuse Permits; National Pollutant Discharge Elimination System Permitted (NPDES) Facilities; and Aquifer Protection Permits.

### 6.3 PRELIMINARY WELL SEARCH

As part of the HTRW Framework Research, URS attempted a preliminary location of wells and compilation of data for wells within the Rio Antiguo Study Area. The preliminary well inventory included a review of Arizona Department of Water Resources (ADWR) well record of registered wells and historical reports and maps in which wells were identified. Well records are presented in Appendix C of this report.

#### 6.3.1 ADWR Well Inventory

The ADWR well inventory records (Appendix C) were compiled from the following databases:

- Ground Water Site Inventory (GWSI) – The GWSI database is the main repository maintained by ADWR for statewide groundwater data. The GWSI field data were collected by the ADWR Hydrology Division’s Basic Data Section or the USGS. The information in GWSI is constantly being updated by ongoing field investigations and through a statewide network of water level monitoring sites. The GWSI data reside in 17 separate databases; each separate database contains a unique set of data such as location information (A1), well construction (C1-C4), or static water levels (SWL). Wells or data sites are assigned a unique 15-character identification, the SITE\_ID, which is the key field for the 17 databases. Referencing the SITE\_ID number enables site specific data to be obtained from all 17 databases (ADWR web site).
- Wells 55 Registry – The Wells-55 Registry contains information provided to ADWR’s Groundwater Management Support Section by well drillers and/or owners. All wells drilled before the Department’s creation in 1980 are required to be registered in the Wells-55 database. In addition, any proposed new wells are required to be associated with a drilling authority, and a well registration number is assigned to each drilling authority that is issued. After a well is drilled, the well owner and driller are both required to submit well information back to the Department. Because most of the information in Wells-55 has been submitted by the well owner and/or the well driller and may not have been verified by the Department, there may be some inaccuracies associated with data for a particular well. Permanent records for existing and new wells are maintained in the database by ADWR (ADWR web site).

In addition to the ADWR well records, URS reviewed the Well List compiled by PAG as part of their Columbus Landfill Study (PAG, 2000). PAG obtained water well and water quality information from the City of Tucson, Tucson Water, ADWR Well 55 Registry, and the GWSI database for wells within the vicinity of the Columbus # 1 and #2 Landfills. Wells in the vicinity of the Columbus Landfill are shown in Figure 4.

### 6.3.2 Site Inspections

URS noted several water wells and potential well structures during the site reconnaissance. Further work would be required to identify water wells that were not previously identified in records reviewed by URS.

## 7.0 SITE RECONNAISSANCE

The purpose of the field reconnaissance was to observe existing operations and environmental conditions, including: chemical storage and disposal areas, evidence of stressed vegetation, disturbed topography, soil and surficial staining, and evidence of underground/aboveground storage tanks. Ms. Dinah Jasensky and Andrea Fletcher of URS conducted the field reconnaissance of the Study Area on March 1 and March 4, 2002. Properties were accessed by walk through, or accessed from public right-of-ways and property perimeters. Photographs taken during the reconnaissance are in Appendix A. Photograph locations are shown on Figure 2.

A two-part reconnaissance was conducted for the subject area. The first consisted of driving the public right-of-way within and near the perimeter of the area. The second reconnaissance was conducted along the Rillito Creek following the bike/walking trail, which provided a more detailed view of the areas not accessible by vehicle. Overall, the area consists of mainly residential properties with some commercial properties interspersed.

There is a zone of manufacturing/commercial properties along Kleindale Road extending from Alvernon Way to Kelvin Road (Photographs 12 through 15). The west side of Alvernon Way also has several commercial properties (Photographs 16 and 17). Most of this area has been zoned multiple use by Pima County. An auto body paint shop was located on North Dodge Boulevard adjacent to Rillito Creek (Photograph 15). What appeared to be a paint booth was visible from the bike trail. A very strong odor of paint and solvents was noticed emanating from this area.

Scattered “wildcat” dumping was visible throughout the riverbed and at the Columbus Landfill (Photographs 18 and 19). Aerial photographs were inconclusive in determining locations of historic “wildcat” dumping. What appeared to be a sand and gravel operation was observed along the river north of the Columbus Landfill (Photograph 11). The Columbus Landfill cover appeared intact with some vegetative growth (Photographs 1, 2 and 3). It was not possible to discern the distinction between Columbus Landfill #1 and #2 during the site reconnaissance.

A residential property located at what is believed to be 3605 North Edith Boulevard contained miscellaneous solid waste including cars and other debris (Photographs 6 and 7). A nearby property, believed to be 3536 North Edith, appeared to be a storage area for heavy equipment and an AST was visible (Photograph 8). The tank is thought to contain fuel for the heavy equipment. Solid waste of unknown origin and an abandoned car was observed on the River Road Nursery property at 2450 River Road (Photographs 4 and 5).

The U of A facility located on Roger Road just east of Campbell Boulevard appears to contain several individual research project facilities (Photographs 20, 21 and 22). The U of A Chemical Engineering Department operates an Arthropod Resistance Management Laboratory in this area. There is also the Global Oscillation Network Group (GONG) operating what appears to be a meteorological station and other weather related experiments. Karstan Laboratory, also located on Roger Road, as is a grass turf experimentation facility. Aerial photographs of this area indicate that the development of the facility occurred between 1954 and 1980.

## 8.0 SUMMARY OF FINDINGS

As described in previous sections, the objective of this research was to identify potential sources that might be contributing to soil or groundwater contamination in the Study Area vicinity. Over 250 parcels in the immediate Study Area were screened, as described in Section 2.0. Properties were specifically evaluated for the potential presence of HTRW as part of historic and/or current operations that may have impacted site soils and/or groundwater.

The results of the HTRW Framework Research indicate several areas and specific properties within or adjacent the Rio Antiguo Study Area with documented HTRW release or potential releases as indicated by current or historic site conditions. These sites include those that were identified in the review of previous environmental reports, City directories or aerial photographs, environmental database search or during the limited site reconnaissance. Based on the data reviewed, areas or groups of properties were determined to have significant findings that may warrant further investigation. The HTRW Framework Research is not intended to constitute an ASTM Phase I Environmental Site Assessment (ESA), rather it is a screening process to narrow the number of parcels within the Study Area for which further ESA would be recommended. Thus, sites with significant findings are those for which potential RECs exist. These sites are summarized in the following Table.

TABLE 8.1 SUMMARY OF FINDINGS

SITE ID	PIMA COUNTY ASSESSORS PARCEL NUMBER	SITE LOCATION	PHOTO NUMBER <i>Appendix A Figure 2</i>	FINDING
1. Columbus Landfill #1 & 2	110043340 11002031A	South bank of Rillito Creek, north of Columbus Blvd.	1,2 and 3	Closed City of Tucson Solid Waste Landfill
2. Cactus Landfill	112010160	Allen Road between Tucson Boulevard and Cactus Road.		Closed City of Tucson Solid Waste Landfill
3. Walnut Landfill	11003070D	South bank of Rillito Creek, north of Alvernon Way		Closed City of Tucson Solid Waste Landfill
4. River Road Nursery	108240110	2450 River Road	4 and 5	Unknown waste material disposal
5. Private property on north bank of Rillito Creek	11102036A	3605 N. Edith Road	6 and 7	Unknown waste material Junk automobiles and parts Potential for petroleum hydrocarbon and solvent contamination, disposal of automobile batteries
6. Private property on north bank of Rillito Creek	11102040A	3536 N. Edith Road	8	Heavy equipment and above ground storage tank (AST) Potential for petroleum hydrocarbon and solvent contamination
7. Private property on north bank of Rillito Creek	unknown	Unknown address	9	Large excavation of unknown origin Site operations unknown

8. Private property on north bank of Rillito Creek	Unknown	Unknown address	10	Construction debris Site operations unknown
9. Aggregate Materials (formerly Columbia Sand and Gravel)	11001007C	4326 River Road	11	Sand and gravel operation Historic waste disposal unknown Heavy equipment storage and AST Potential for petroleum hydrocarbon contamination
10. Kleindale Industrial District:		Area south of Rillito Creek, north of Kleindale Rd., west of Alvernon Way, and east of Kelvin Blvd.	12	City directories indicate historic occupants of concern, including a gas station, auto shops, and various manufacturing facilities Database listings include Federal CERCLIS, RCRA Generator, and underground storage tank (UST) sites
10a: Kleindale Industrial Park	11103042A 11103046B 11103046C	3419 E. Kleindale 3415 E. Kleindale 3415 E. Kleindale	12	Manufacturing operations with unknown chemical storage, handling and disposal operations CERCLIS site
10b. Truly Nolan	11103038B	3501 E. Kleindale	13	Unknown pesticide storage, handling and waste disposal practices RCRA Small Quantity Generator
10c. Tucson Electric Power Northeast Substation	11003031A 110030370 110030360 11003034A 11003029A	3567 E. Kleindale No Address 3513 E. Kleindale 3553 E. Kleindale 3535 E. Kleindale	13	Current or past use of PCB-containing equipment unknown
10d. Carson Concrete	1003022C	3475 N. Dodge	14	Unknown chemical use, storage or disposal practices

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10e. Factory Paint & Body	11003008C	3450 N. Dodge	15	Unknown solvent handling, storage, or disposal practices Paint booth stack emissions management unknown
10f. Pima County Flood Control District	11104096B 11104097C 11104103A	3325 N. Alvernon 3831 E. Farr Place 3822 N. Alvernon	16 17	Heavy equipment storage and AST Unknown operations Potential for petroleum hydrocarbon and solvent contamination
11. Various wildcat dump areas	Rillito channel, no parcel number	Throughout the Rillito channel in vicinity of Columbus Landfills	18, 19	Construction debris and potential asbestos-containing transite pipe
12. UA Campus Agricultural and Research Laboratories	10825017	Area adjacent to south bank of Rillito Creek, east of Campbell Ave., north of Roger Rd., west of Tucson Blvd.	20, 21, 22	RCRA Small Quantity Conditionally Exempt Generator ADEQ registered underground storage tank (UST) site Observed ASTs Unknown chemical storage, handling and disposal Fill piles of unknown origin

## 8.1 AREA LANDFILLS AND WILDCAT DUMPS

Four closed solid waste landfills and several wildcat dumps have been documented in the Study Area (PAG, 2000 and AJAY Environmental, 1996). URS reviewed reports of previous investigations and conducted a limited site reconnaissance of area landfills and wildcat dumps (Photographs 1, 2, 3, 18 and 19).

Previous investigations of the closed Columbus #1 and #2 Landfills and the closed Walnut Landfill indicated that the landfills had low potential to impact underlying groundwater in the Study Area, however, the reports also indicated that more data was needed to conclusively evaluate the existing and potential impact of the closed landfills. Data needs identified in reports reviewed included long term landfill gas monitoring, completion of monitoring wells in the shallow zone in the vicinity of the landfills and long term monitoring of groundwater quality (PAG, 2000, AJAY Environmental, 1996).

The closed Cactus Landfill was referenced in the Environmental Database (Section 3.0, Figure 2, Appendix B). More information is needed regarding the operational history, waste characteristics and physical boundaries of the Cactus Landfill to assess its potential impact on soils and groundwater in the Study Area.

URS observed evidence of scattered wildcat dumping in several locations of the Study Area during the site reconnaissance. A wildcat dump as defined by PAG is a "dump or undocumented landfill, which consists mostly of scattered surface litter that would at the most be equivalent to a few pickup truck loads of waste" (PAG, 1996). Wildcat dumps observed included various locations of scattered debris along the Rillito Creek channel, the area of the Columbus Landfills, and several properties along the north bank of the Rillito Creek. Properties along the north bank of the Rillito Creek are discussed in Section 8.4 of this report.

What appeared to be several sections of potentially asbestos-containing transite pipe were observed in the channel of Rillito Creek in the vicinity of the Columbus Landfill (Figure 2 and Appendix A, Photograph 18). Several piles of suspect Asbestos Containing Materials (ACM) were documented in the Rillito channel between Dodge and Swan Road during a 1993 Environmental Site Assessment (AJAY Environmental, 1993). URS observed minor amounts of construction debris in this area, near the closed Columbus Landfills. Based on the site reconnaissance, the potential HTRW of concern in wildcat dump areas in the Rillito Creek channel would be asbestos.

## 8.2 KLEINDALE INDUSTRIAL DISTRICT

For the purposes of this report, Kleindale Industrial District includes those properties south of Rillito Creek, north of Kleindale Rd., west of Alvernon Way, and east of Kelvin Blvd (Photograph 12, Figure 2). Historic City Directories and aerial photographs indicate occupation of this area by manufacturing and automotive industries since the early 1950's. According to the Pima County Land Information System (PCLIS) database, zoning for this area is Pima County multiple use (PCLIS, 1999).

Within the Kleindale Industrial District are several parcels identified as the Kleindale Industrial Park (Photograph 12, Figure 2). The Kleindale Industrial Park is a listed CERCLIS site (Appendix B). More information is needed to determine specific site operations and chemical storage, handling and disposal practices for commercial businesses within the Kleindale Industrial District, including the Kleindale Industrial Park.

Other properties of concern noted in the Kleindale Industrial District during the site reconnaissance included an auto body paint shop located on North Dodge Boulevard adjacent to the Rillito River (Photograph 15, Figure 2). A paint booth was visible from the bike trail. A very strong odor of paint and solvents was noticed in this area.

Heavy equipment and ASTs were observed at facility located 3325 N. Alvernon Way, south of Farr Place (Photograph 16, Figure 2) and at Carson Concrete located at 3475 N. Dodge Blvd adjacent to Rillito Creek (Photograph 14, Figure 2). A large amount of materials, heavy equipment and trucks were found stored on a facility located at 3831 E. Farr Place (Photograph 17) and at a facility located at 3822 N. Alvernon Way. Sites with heavy equipment storage and ASTs would be considered to have the potential for release of petroleum hydrocarbons, solvents and metals. The ADEQ UST database includes a listing for the address of 3832 Farr Place (Table 6.1).

Other current occupants of the Kleindale Industrial District include a pest control company and the Tucson Electric Power North East Substation, both located adjacent to south bank of Rillito Creek, north of Kleindale Rd., and west of Dodge Blvd. The Truly Nolan pest control company at 3501 E Kleindale is listed in the environmental database as RCRA Small Generator (Photograph 13, Appendix B). The Tucson Electric Power site is comprised of five Pima County parcels and extends from 3513 through 3567 E. Kleindale (Photograph 13, Figure 2). More information is needed to determine whether PCB-containing equipment has been used on site.

In addition to properties identified during the site reconnaissance, directory searches indicated historical occupation of this area by a gas station, fiberglass manufacturer, several auto repair

and paint shops, woodworking and metals finishing facilities. Further, four registered UST sites are located within the Kleindale Industrial District. Based on current and historical occupation, there is a potential for HTRW from these properties to have impacted the Study Area. Potential chemicals of concern include solvents, petroleum hydrocarbons, pesticides, PCBs, asbestos and metals.

### **8.3 UNIVERSITY OF ARIZONA CAMPUS AGRICULTURAL CENTER**

The U of A Campus Agricultural Center extends from the south bank of Rillito Creek, east of Campbell Ave., north of Roger Rd., and west of Tucson Blvd. Several research laboratories/facilities are currently located in this area. Historic aerial photographs show that the property was developed sometime between 1954 and 1980. During the site reconnaissance URS observed fill piles and what appear to be fuel or chemical storage areas, including above ground storage tanks at several of the research facilities. The facility is a listed RCRA generator and UST facility (Appendix B). Photographic documentation of U of A facilities adjacent to Rillito Creek is in Appendix A, Photographs 20, 21 and 22.

Information regarding current and historic operations including chemical use and waste disposal are needed to assess the potential impact of the U of A facilities on the Study Area. Potential chemicals of concern include but are not limited to solvents, petroleum hydrocarbons, pesticides, PCBs, and nitrates.

### **8.4 SELECTED PROPERTIES NORTH OF RILLITO CREEK**

Several properties of concern were identified adjacent to the north bank of Rillito Creek during the site reconnaissance. These included a sand and gravel operation, plant nursery and four private properties. Photographs documenting waste disposal or materials storage at these sites are in Appendix A.

Aggregate Materials (formerly Columbia Sand and Gravel) is located at 4326 East River Road (Photograph 11, Figure 2). City directories indicate the historic operation of the sand and gravel site since 1960. Potential environmental concerns for the sand and gravel site include possible historic waste disposal in excavated areas and petroleum hydrocarbon contamination associated with operation and maintenance of heavy equipment.

Several areas of dumping were noted during the site reconnaissance on private property bordering the north bank of Rillito Creek. Used automobiles, an automobile gas tank and miscellaneous automobile parts, wood and metal scrap materials are stored on the south boundary of the private property at 3605 N. Edith (Photographs 6 and 7). Heavy equipment

storage and an aboveground storage tank were observed on the property at 3536 N. Edith (Photograph 8).

Miscellaneous plastic, wood and metal debris and containers were stored along the south fence line of the River Road Nursery (Photographs 4 and 5). A large pit lined with boulders adjacent to a large metal building was observed on one property (Photograph 9), and a large amount of construction debris was observed on another property (Photograph 10), both with unknown addresses.

The source of waste material observed at the properties north of Rillito Creek is unknown. Facilities with heavy equipment storage and ASTs should be evaluated for potential release of petroleum hydrocarbons, solvents and metals. Properties with construction debris should be evaluated for the presence of ACM. Overall, the potential occurrence of HTRW at select properties of concern adjacent to the north bank of Rillito Creek include but are not limited to solvents, pesticides, petroleum hydrocarbons and asbestos.

## 9.0 CONCLUSIONS AND RECOMMENDATIONS

URS conducted HTRW Framework Research for PCDOT&FCD of a four-mile section of the Rillito Creek and surrounding land between Craycroft Road and Campbell Avenue in Tucson, Arizona (Figure 1). The investigation is part of the USACE Feasibility Study for the proposed El Rio Antiguo Ecosystem Restoration Project.

The HTRW Framework Research was conducted as a screening level assessment to summarize HTRW occurrences within and nearby the project area. Existing and past land use was evaluated, based on a review of the historical records and other public documentation, to evaluate the potential presence of HTRW sites in and around the Study Area.

URS followed selected guidelines of ASTM Standard 1527 to identify properties with the potential presence of RECs. The information collected during the HTRW Framework Research was evaluated with respect to known or suspect environmental conditions. For the purposes of this study, properties with visual or historical evidence of HTRW storage or disposal; properties listed in the regulatory environmental databases with one or more recorded releases of hazardous materials; or properties with current or historical operations known to be associated with use, storage or disposal of HTRW were determined to have potential RECs. Further investigation in accordance with ASTM Standard 1527 is needed to document RECs at properties identified during the initial screening phase of work. URS did not conduct interviews with property owners or occupants, review City of Tucson Fire Department Records, sewer records, or building permits, or conduct detailed field reconnaissance of individual properties.

The results of the HTRW Framework Research indicated twelve areas within the Study Area with significant findings warranting further investigation. These areas include three closed solid waste landfills, scattered “wildcat dumps”, properties within an area described as the Kleindale Industrial district, the University of Arizona (U of A) Campus Agricultural Center, and six commercial and private properties located along the north bank of Rillito Creek (Figure 2).

Potential contaminants of concern identified during the HTRW Framework Research investigation included solvents, petroleum hydrocarbons, polychlorinated biphenyls (PCBs), pesticides, metals and asbestos. URS recommends that Phase I ESAs be conducted for properties identified in each of the areas listed above in order to determine whether RECs are present, and if so, to evaluate the potential impacts of any contamination in the absence of response actions.

## 10.0 REFERENCES

- AJAY Environmental Consultants, 1993. *Environmental Assessment Report for Rillito River Right-Of-Way Between Dodge Boulevard and Swan Road, Pima County, Arizona*. Prepared for Pima County Department of Transportation and Flood Control District by AJAY Environmental Consultants, INC., Tucson AZ, August 9, 1993.
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