

# ASLD Property

## Houghton Road and Valencia Road

### City of Tucson, AZ

# Environmental Resource Report

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## I. INTRODUCTION AND PURPOSE OF THIS REPORT

This Environmental Resource Report (ERR) has been prepared to address certain environmental resources present on a 2,590+/- acre property located within the Houghton Area Master Plan and owned by the Arizona State Land Department (ASLD). Please refer to *Exhibit A: Location Map*.

This report has been prepared in accordance with Section 4-02.0.0: Floodplain, Wash and ERZ Standards of the City of Tucson Unified Development Code. The overall purpose of this report is to accurately identify the areas on the site that qualify as riparian areas, or more specifically Protected Riparian Areas (PRA) as defined by the previously mentioned UDC section. Currently, the property contains the following environmental designation:

- Critical and Sensitive Wildlife Habitat as identified in the 1986 study (Critical and Sensitive Wildlife Habitats of Eastern Pima County) completed by Dr. William Shaw Riparian Area.

Please refer to *Exhibit B: Critical and Sensitive Wildlife Habitats of Eastern Pima County* (Dr. William Shaw 1986) for the location of this environmental designation on the property.

Based on initial site observations and current aerial photographs of the site, it was apparent that this designation may not accurately reflect the physical resources on the site. Also, it was observed that nearby subdivisions to the south have developed in areas designated as Shaw Critical and Sensitive Wildlife Habitat, further suggesting that this designation may not accurately address physical site conditions. As such, this report was prepared to more accurately identify PRA.

As a matter of background, this property has been identified by the Arizona State Land Department as ready for development and is currently being planned to allow for a mixture of land uses, including residential, commercial and employment. As such, the ASLD and their consultants have been working with the City of Tucson to develop a foundation for development of the site, which involves the preparation of a Planned Community Development (PCD) for the property which will govern its development. This is directly relevant to this ERR. It is the intent of the Arizona State Land Department to provide the regulatory standards for the treatment and mitigation of disturbed PRA in the PCD.

## II. PROPERTY INFORMATION

The 2,590+/- acre subject property is located as shown on *Exhibit A: Location Map* and *Exhibit C: Aerial Photograph* for the location of the property. The property lies completely within the City of Tucson incorporated limits. Pima County Assessor records show the subject property consists of the following tax parcel numbers: 141-01-005C, 141-02-0010, 141-01-0110, 141-01-007A, 141-01-0120, 141-02-0120, 141-01-0110, 141-17-001A, 141-17-011B, 205-64-6130 and 205-64-6170.

The subject property consists of the following sections or portions of sections:

Township 15 South, Range 15 East:

- All of Section 14.

- Portions of Sections 2, 11, 13, 24 and 25.

Township 15 South, Range 16 East:

- Portions of Sections 19 and 30.

### III. PROTECTED RIPARIAN AREA

According to Section 4-02.2.3 Protected Riparian Area (PRA) of the UDC:

*The protected riparian area (PRA) is the area that has riparian habitat that is to be preserved. Except for watercourses designated by ordinance as subject to ERZ and WASH regulations, the protected riparian area shall not exceed the 100-year floodplain. Protected riparian areas include areas that provide habitat structure, wildlife food and shelter, and that also aid in supporting wildlife connectivity, erosion control and help to improve stormwater quality. Riparian habitat may include the vegetative resources, mapped areas and wildlife habitat and corridors listed below where such habitat is riparian in nature and function.*

As per Section 4-02.2.3 Protected Riparian Area (PRA) of the UDC, the focus of this ERR was on the areas of the site located within 100-year floodplains, both FEMA and local. *Exhibit D: 100-Year Floodplains* identifies the areas on the site that are included within 100-year floodplains. These floodplains are inclusive of both designated and proposed W.A.S.H and ERZ watercourses and a FEMA floodplain and are described as follows:

- A FEMA Zone A floodplain associated with the Atterbury Wash is located in the subject property running the extent of the site from the southeast corner to the northwest corner. This floodplain is shown on FIRM (Flood Insurance Rate Map) panels #04019C2320L, 04019C2925L and #04019C2930L
- The Atterbury Wash is a designated ERZ regulatory watercourse throughout the extent of the project site.
- There are three tributary washes to the Atterbury Wash that are proposed ERZ watercourses within the subject property.
- There are portions of four tributary washes to the Atterbury Wash that are designated as proposed W.A.S.H. watercourses based on the Tucson Storm Water Management Study (TSMS) located in the subject property.
- Per City of Tucson data, local washes containing flows of 100 cfs or greater.

On May 10<sup>th</sup>, 22<sup>nd</sup> and 29<sup>th</sup>, 2019, staff from The WLB Group, Inc. conducted a field analysis of the subject property to assess the vegetation on the property with the intent of identifying areas on the site that meet the City of Tucson criteria for PRA. According to Section 4-02.2.3 Protected Riparian Area (PRA) of the UDC, there are certain criteria to be used to make this determination and as such

these criteria were used during our field analysis. Please refer to *Exhibit E: Protected Riparian Area (PRA)*. This exhibit identifies the location of PRA meeting the criteria on the subject property.

Please also refer to *Exhibit F: Photograph Location Key Map and Exhibit G: Ground Level Photographs* for photographs of the areas on site identified as PRA.

The following text contains excerpts from the technical standard containing these criteria. After each of the criteria, we have provided a response describing the conditions of the subject property.

## **A. Vegetative Resources**

Vegetative Resources are groups of three or more individual plants in close proximity to each other representing any of the plant species (and any combination of associated vegetative structure) listed below.

1. Mesoriparian plant species, including Arizona walnut, Fremont cottonwood, Goodding (black) willow, Arizona sycamore and Arizona ash.

*Results of Analysis: There are no Mesoriparian plant species on the subject property.*

2. Over-story vegetation consisting of closely spaced, perennial, woody (e.g., mesquite, foothill Palo Verde, Mexican Palo Verde, ironwood, Nettleleaf hackberry), that are generally six feet or more in total height, and where the distance between canopy margins of individuals of the predominant over-story plant species is less than two times the height of the tallest individuals.

*Results of Analysis: Please refer to Exhibit E: Protected Riparian Area which identifies area on the site which meets the City of Tucson criteria for PRA designation.*

3. Understory vegetation consisting of closely spaced, perennial woody plants (e.g., catclaw and whitethorn acacia) that are generally six feet in total height, or less, and where the distance between canopy margins of individuals of the predominant understory plant species is generally less than two times the height of the tallest individuals, excluding nearly pure stands of understory vegetation consisting of the following perennial woody plants: burrow bush, creosote bush, desert broom, or triangle-leaf bursage.

*Results of Analysis: Please refer to Exhibit E: Protected Riparian Area which identifies area on the site which meets the City of Tucson criteria for PRA designation.*

4. Combinations of overstory and understory vegetation that together constitute valuable habitat, and tobasa swales.

*Results of Analysis: Please refer to Exhibit E: Protected Riparian Area which identifies area on the site which meets the City of Tucson criteria for PRA designation.*

**B. Mapped Areas shown on the Critical and Sensitive Wildlife Habitat Maps which contain:**

1. Major segments of desert riparian habitat extending from public preserves.

*Results of Analysis: Not applicable since there are no public preserves located near or adjacent to the subject property.*

2. Major segments of desert riparian habitat not extending directly from a public preserve but containing a high density and diversity of plant and animal species.

*Results of Analysis: The density of vegetation is variable throughout the site. The northern areas of the site near Irvington Road contain washes that are more incised than other portions of the site. These areas of more incised washes contained greater densities of trees, primarily consisting of Mesquite trees and these areas are included in the PRA designated area. High density and diversity of animal species was not observed during site visits.*

3. Deciduous riparian woodlands.

*Results of Analysis: Not applicable since there are no deciduous riparian woodland areas on the property.*

4. Mesquite bosques.

*Results of Analysis: There are areas on the site containing more dense clusters of Mesquite trees. These areas are included in the PRA designated area.*

5. Lakes, ponds, or wetlands.

*Results of Analysis: There is an area in the northeast quadrant of Section 24 that contains a cattle drinking area (aka drinker) and it contained water during the May 10th site visit. It was not visited during the other site visits. A current Special Land Use Permit from the Arizona State Land Department is in place on this portion of the State Land property which allows for grazing, which includes a corral and cattle drinker. The area of the cattle drinker is surrounded by the PRA designated area.*

**C. Wildlife includes, but is not limited to, the wildlife and areas identified in the public draft or final City of Tucson Habitat Conservation Plan applicable to the regulated area.**

According to the City of Tucson Draft Habitat Conservation Plan (DHCP) the subject property does not fall within any of the permitted planning areas contained in the draft plan. No subsequent editions of the DHCP have been completed to date.

Based on the Arizona Game and Fish Department's Online Environmental Review Report, there are a variety of Special Status Species that have been documented within a three-mile radius of the subject property. Refer to *Appendix A* for the Environmental Review Report which lists the documented Special Status Species. This report is a tool to identify the potential for certain plant and animal species to occur on a property. The report does not necessarily mean that any particular species is present on the subject property.

The southernmost tip of the subject property is located approximately 6 miles from the Cienega Creek Natural Preserve. The Cienega Creek Corridor is one of six Critical Landscape Connections described in the Maeveen Marie Behan Conservation Lands System Plan (the Sonoran Desert Conservation Plan). These Critical Landscape Connections are broadly-defined areas where biological connectivity has been compromised yet opportunities still exist to preserve wildlife mobility through conservation.

#### **IV. ENVIRONMENTAL RESOURCE REPORT REQUIREMENTS**

The following information is provided in response to Section 4-02.2.3.B which addresses encroachment in regulated areas. This report identifies the regulated area (area within the 100-year floodplain) and PRA within this property. As such, the following information is being provided pursuant to the requirements of Section 4-02.2.3.B.

##### **A. The Location of the 100-Year Floodplain**

The location of 100-year floodplains on the subject property is shown on *Exhibit D: 100-Year Floodplains*. The 100-year floodplains on the property consist of the following:

- A FEMA Zone A floodplain associated with the Atterbury Wash located running the extent of the site from the southeast corner to the northwest corner. This floodplain is shown on FIRM (Flood Insurance Rate Map) panels #04019C2320L, #04019C2925L and #04019C2930L.
- Three tributary washes to the Atterbury Wash which are proposed ERZ watercourses lie within the 100-year floodplain.
- Two tributary washes to the Atterbury Wash which are designated as proposed W.A.SH. watercourses lie within the 100-year floodplain.
- Per City of Tucson data, local washes containing flows of 100 cfs or greater.

##### **B. Soil Conditions and Erosion Potential**

Based on the soil profiles defined in the National Resource Conservation Service Custom Soils Report and minimal slope throughout the property there is no indication of abnormal erosion potential. Please refer to *Appendix B* for the soils report.

### **C. Existing Rights-of-Way or Easement Dedications**

There are several existing right-of-way or easement dedications for washes within 500-feet either upstream or downstream of the subject property. They are described as follows:

- The Atterbury Wash is located within a 200-foot wide public drainage/access easement which was granted to the City of Tucson via final plat, which enters the Desert Willow Estates subdivision at roughly the midpoint of the subject property. The final plats for Desert Willow Estates (MP 57015 and 57016) identify this easement.
- The Mesquite Ranch Wash is located within a Natural Undisturbed Open Space (NUOS) common area dedicated and conveyed by the Final Plat for Saguro Trails Block 1 (Sequence #20182260575) to the Pima County Regional Flood Control District for maintenance and flood control.
- The Pantano Vista Mobile Home park lies to the north of the subject property, north of Irvington Road. This mobile home park is located on leased State Land. According to the Development Plan for the project (DP Book 15, Page 41), the Harrison Hills Wash and the Mesquite Ranch Wash travel through the mobile home park. These washes are located on land owned by the State of Arizona.

### **D. Existing Drainageway or Proposed Drainageways On or Adjacent to Site**

Currently, the property is not platted and there are no dedicated drainageways on the site.

Drainage areas required to convey surface water through the site will be dedicated to the City of Tucson via future final plats as public drainageways. This will certainly be the case for the Atterbury Wash which is located in public drainageways owned by City of Tucson further upstream and in the residential subdivisions north of Irvington Road. The exact location of such public drainageways will be determined in the future during the subdivision platting process.

### **E. Previous Hydraulic/Hydrology Studies Affecting the Site**

No hydraulic/hydrologic studies have been identified that are relevant to the subject property.

A portion of the subject property is located within FEMA (Federal Emergency Management Agency) FIRM (Flood Insurance Rate Map) panels #04019C2320L, #04019C2925L and #04019C2930L. The majority of the subject property falls within Zone X which is outside the 500-year floodplain. A large portion of the subject property associated with the Atterbury Wash is designated as Zone A. Please refer to *Exhibit D: 100-Year Floodplains*.

### **F. Groundwater Recharge**

This information is not being provided in this report since the site is being proposed for development and not groundwater recharge. It should be noted, however, that the

development of the subject property is likely to increase groundwater recharge potential due to the proposed use of infiltration via retention/water harvesting basins.

## **G. Sediment Transport**

This information is not being provided in this report since sediment transport is not relevant to the primary purpose of this report, which is identification of PRA.

## **H. Existing and Proposed Utilities**

### **A. Sewer**

#### *Existing Infrastructure*

The sewer infrastructure in the area of the subject property is public and owned and maintained by the Pima County Regional Wastewater Reclamation Department (PCRWRD).

- There is a 10-inch public sewer pipe consisting of Polyvinylchloride (PVC) located approximately ¼ mile east of Harrison Road crossing Irvington Road that runs south for approximately 1 mile through the subject property and into the southwest corner of the Saguaro Trails Planned Area Development.
- There is an 18-inch public sewer pipe consisting of PVC located in Valencia Road terminating approximately ¼ mile east of the intersection at Houghton Road and Valencia Road.
- There are two public 10-inch sewer pipes consisting of PVC extending south across Poorman Road from the Mesquite Ranch subdivision approximately 600 feet and 1,300 feet respectively, east of Houghton Road.
- There is an 8-inch public sewer pipe consisting of PVC extending south from within the Desert Willow Estates subdivision terminating at the center line of E Coyote Willow Trail approximately 1,200 feet east of Houghton Road.
- There is a 10-inch public sewer pipe in Rita Ranch Road terminating at the property boundary line.

#### *Proposed Infrastructure*

Future purchasers of the subject property, or portions of the subject property, will work with the Pima County Regional Wastewater Reclamation Department to plan and design for the extension of sewer infrastructure to serve future development.

## B. Potable Water

### *Existing Infrastructure*

Tucson Water owns and maintains water lines in the area of the subject property described as follows:

- There is a 24-inch cast in place concrete (CC) water main running along the west side of the Houghton Road right-of-way the extent of the subject property.
- There is a 12-inch ductile iron (DI) pipe connecting to the 24-inch Houghton Road main at the intersection of Poorman Road and Houghton Road. This 12-inch DI line is within a 15-foot utility easement south of the Poorman Road right-of-way.
- There is an 8-inch PVC water pipe along the south side of the Coyote Willow Trail right-of-way. This pipe connects directly to the 24-inch Houghton Road CC main.
- There is a 12-inch DI water line located in the south side of the Valencia Road right-of-way. This pipe terminates approximately 2,000 feet east of the intersection of Valencia Road and Houghton Road.
- There is a 12-inch Concrete Asbestos (CA) water line in the south side of the Irvington Road right-of-way that runs along a portion of the northern boundary of the subject property terminating approximately 1,500 feet west of Houghton Road.
- There is a 30-inch DI non-potable water main on the approximate center line of the Irvington Road right-of-way along a portion of the northern boundary of the subject property. This line extends south approximately ¼ mile east of the intersection of Harrison Road and Irvington Road. This main heads east at approximately Bilby Road where it leads into the Civano Planned Area Development.

### *Proposed Infrastructure*

Future purchasers of the subject property, or portions of the subject property, will work with Tucson Water to plan and design for the extension of water infrastructure to serve future development.

## C. Electric

### *Existing Infrastructure*

TEP owns and maintains overhead distribution lines along the south side of Irvington Road and overhead transmission lines along the north side of Irvington Road. There are overhead distribution lines along the east side of Houghton Road until Drexel Road where the distribution lines switch to the west side of Houghton road and continue to Interstate 10.

### *Proposed Infrastructure*

Future purchasers of the subject property, or portions of the subject property, will work with Tucson Electric Power to plan and design for the extension of electric infrastructure to serve future development.

## I. Other Watercourse Characteristics

The Atterbury Wash and the surrounding area has been grazed by cattle since the mid 1800's. Cattle ranching and farming were the predominant land uses in the Rincon Valley until the 1950's, and as a result, the ephemeral Atterbury Wash has been disturbed over time. More recently, the Atterbury Wash has been relatively undisturbed with the exception of the Desert Willow Estates subdivision at the intersection of Houghton and Valencia roads where flows were channelized along the perimeter of the development. The Atterbury Wash has been modified and channelized in the area north of Escalante Road and then north until it terminates and connects with the Pantano Wash at a point north of Golf Links Road.

## J. Boundary of Proposed Development

Refer to *Exhibit A: Location Map*.

## K. Aerial Photographs

Refer to *Exhibit C: Aerial Photograph*.

## L. Ground Level Photographs

Refer to *Exhibit F: Photograph Location Key Map and Exhibit G: Ground Level Photographs*.

## M. Basin Management Plan

There are no applicable basin management plans which recommend that watercourses on the site remain in a natural state.

## **N. Riparian Resources Map**

Please refer to *Exhibit B: Critical and Sensitive Wildlife Habitats of Eastern Pima County* (Dr. William Shaw 1986).

Plant inventories for the property will occur in the future after property is purchased by developers and when a Native Plant Preservation Plan is prepared in accordance with City of Tucson requirements.

## **O. Delineation of the Proposed Protected Riparian Area**

Please refer to *Exhibit E: Protected Riparian Area* for the location of Protected Riparian Area on the subject property. The total area of the Protected Riparian Area is approximately 396+/- acres. The regulated area (areas located within the 100-year floodplain of regulated watercourses) on the site consists of approximately 706+/- acres.

## **P. Delineation of Riparian Resources and Proposed Recreation Areas**

The Houghton Greenway extends south through the subject property along either side of Houghton Road until it reaches Valencia Road. At this point, the greenway only exists on the east side and extends approximately 1,800 feet south of Valencia Road. According to the Houghton Area Master Plan Parks and Trails Map, an urban trail is proposed along the Atterbury Wash in the north central portion of the site leading to the Chuck Huckleberry Loop multi-use path on the western boundary of the subject property. Throughout the central and southern sections of the subject property, urban pathways are proposed along the Atterbury Wash that continue 500-feet upstream of the subject property.

According to the Eastern Pima County Trail System Master Plan, the Cienega Creek candidate utility easement local trail number 277 is proposed to connect to the Houghton Greenway at Rita Ranch Road. This proposed candidate trail is within 500 feet of the subject property; however, no trail currently exists nor does the proposed trail follow a wash or other environmental resource.

Please refer to *Appendix C: Houghton Area Master Plan Parks and Trails Map and Appendix D: Eastern Pima County Trail System Master Plan Map*.

## **Q. Plant Inventory**

Plant inventories for the property will occur in the future after property is purchased by developers and when a Native Plant Preservation Plan is prepared in accordance with City of Tucson requirements.

## **R. Critical and Sensitive Habitats**

Please refer to *Exhibit B: Critical and Sensitive Wildlife Habitats of Eastern Pima County* (Dr. William Shaw 1986).

## **S. Significant Densities of Wildlife by Species**

This report did not address significant densities of wildlife species. Reports addressing this issue would be prepared, if required, by future purchasers of this property.

## **T. Description of the Impact on Protected Riparian Area**

The development of this property may impact the Protected Riparian Area. Requirements related to potential impacts and mitigation of impacts will be addressed in the Planned Community Development (PCD).

## **U. Statement from AZ Game and Fish**

Please see *Appendix A: Arizona Game and Fish Environmental Review Tool Report*.

## **V. Draft Mitigation Plan**

As previously mentioned in this report, mitigation standards for the disturbance of Protected Riparian Area on this property will be addressed in the Planned Community Development (PCD).

## **W. Other Landscaping Requirements**

Any other special landscaping requirements for this property will be addressed in the Planned Community Development (PCD).

## **BIBLIOGRAPHY**

*Balanced and Critical Basin Map*, Pima County

*Eastern Pima County Trail Systems Master Plan Map*, Pima County, Parks and Recreation Department. (1988)

*Map Guide*, Pima County Department of Transportation

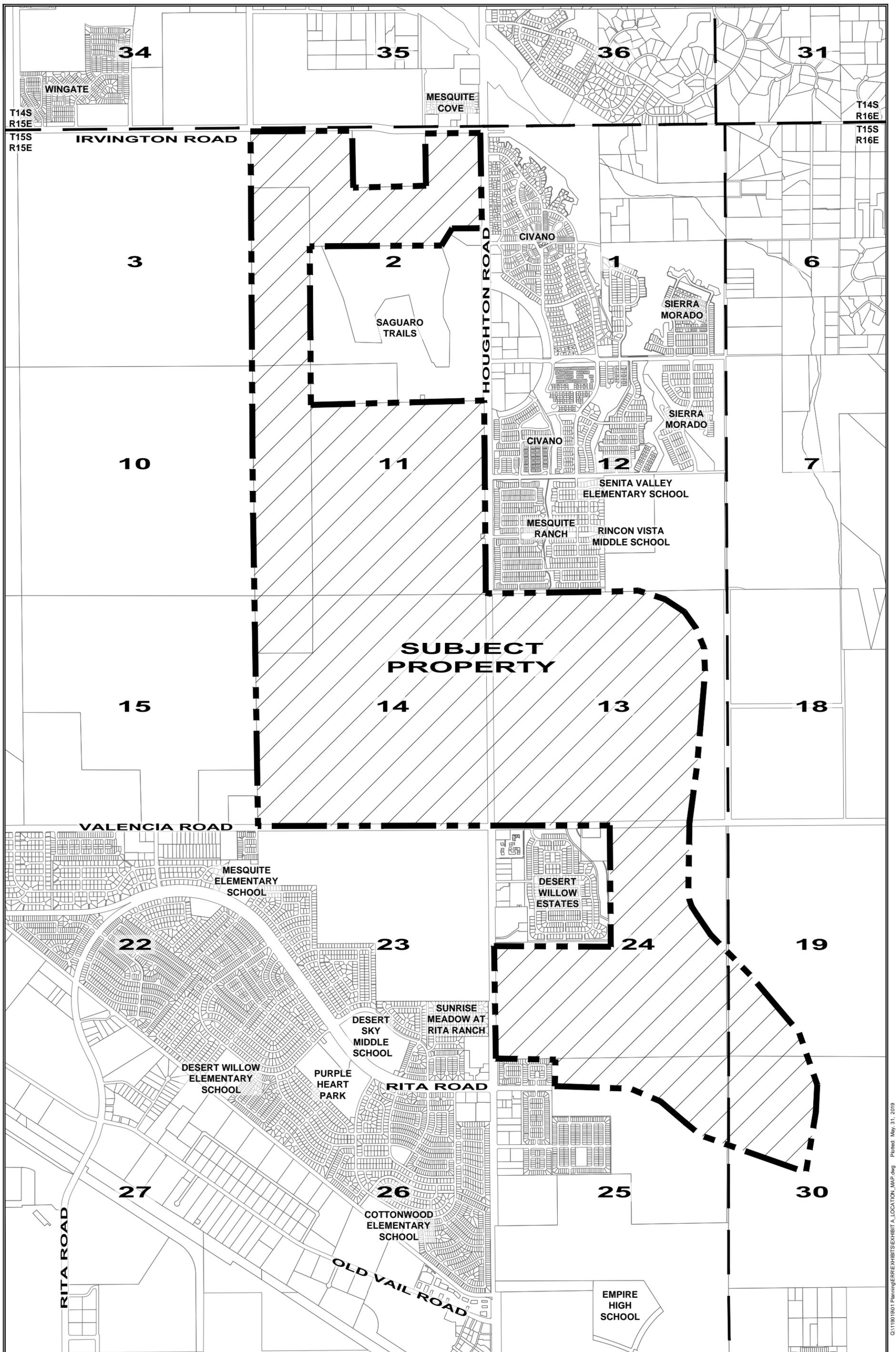
*Sonoran Desert Conservation Plan*, Pima County, Office of Sustainability and Conservation (2001)

*Technical Standards Manual, Supplement to the Unified Development Code (January 2013)*, City of Tucson

*Tucson Stormwater Management Study-Natural Riparian Habitat Inventory (March 1995)* City of Tucson

*Unified Development Code*, City of Tucson

## EXHIBITS

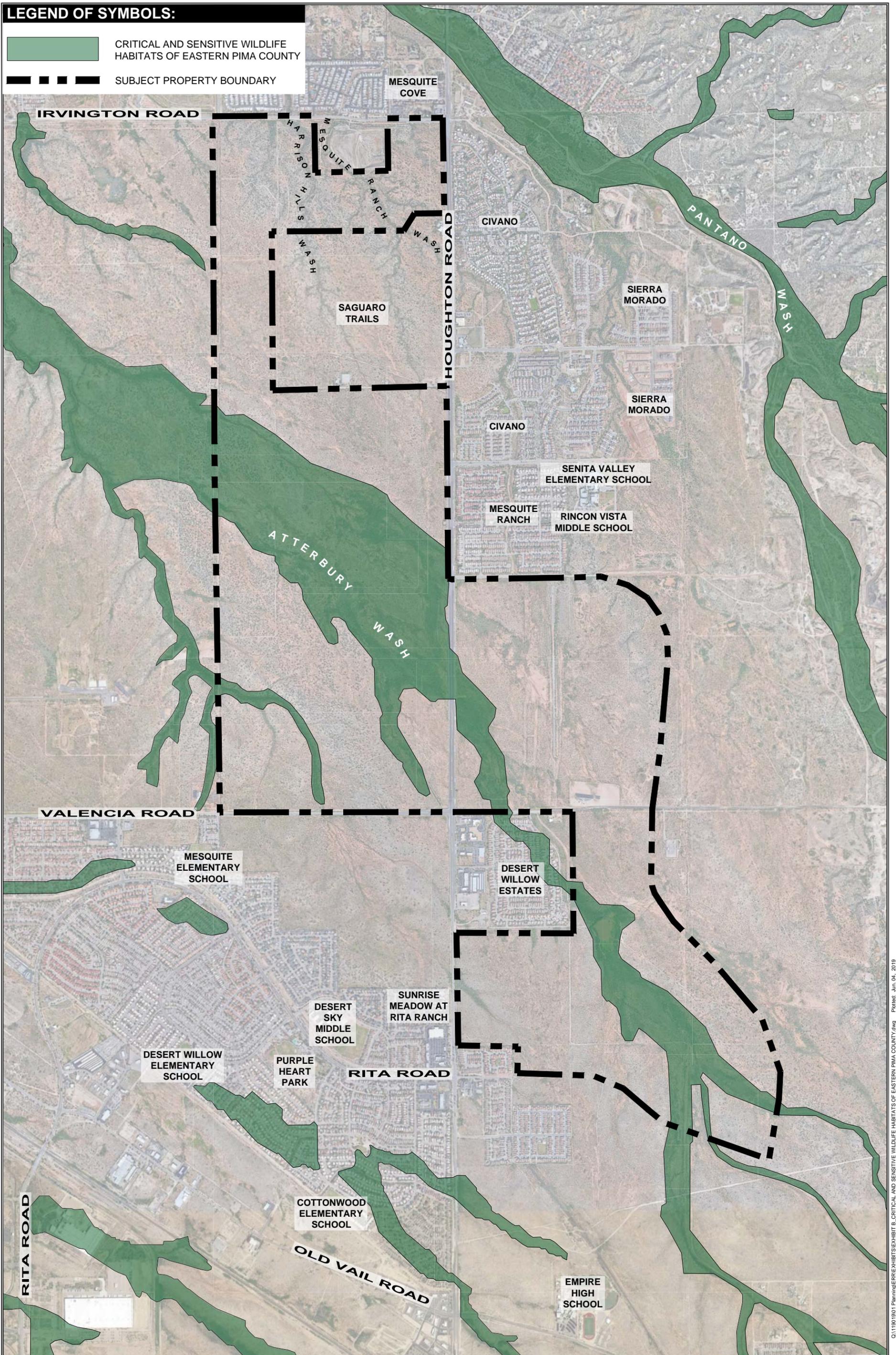


**Exhibit A: LOCATION MAP**



**LEGEND OF SYMBOLS:**

- CRITICAL AND SENSITIVE WILDLIFE HABITATS OF EASTERN PIMA COUNTY
- SUBJECT PROPERTY BOUNDARY



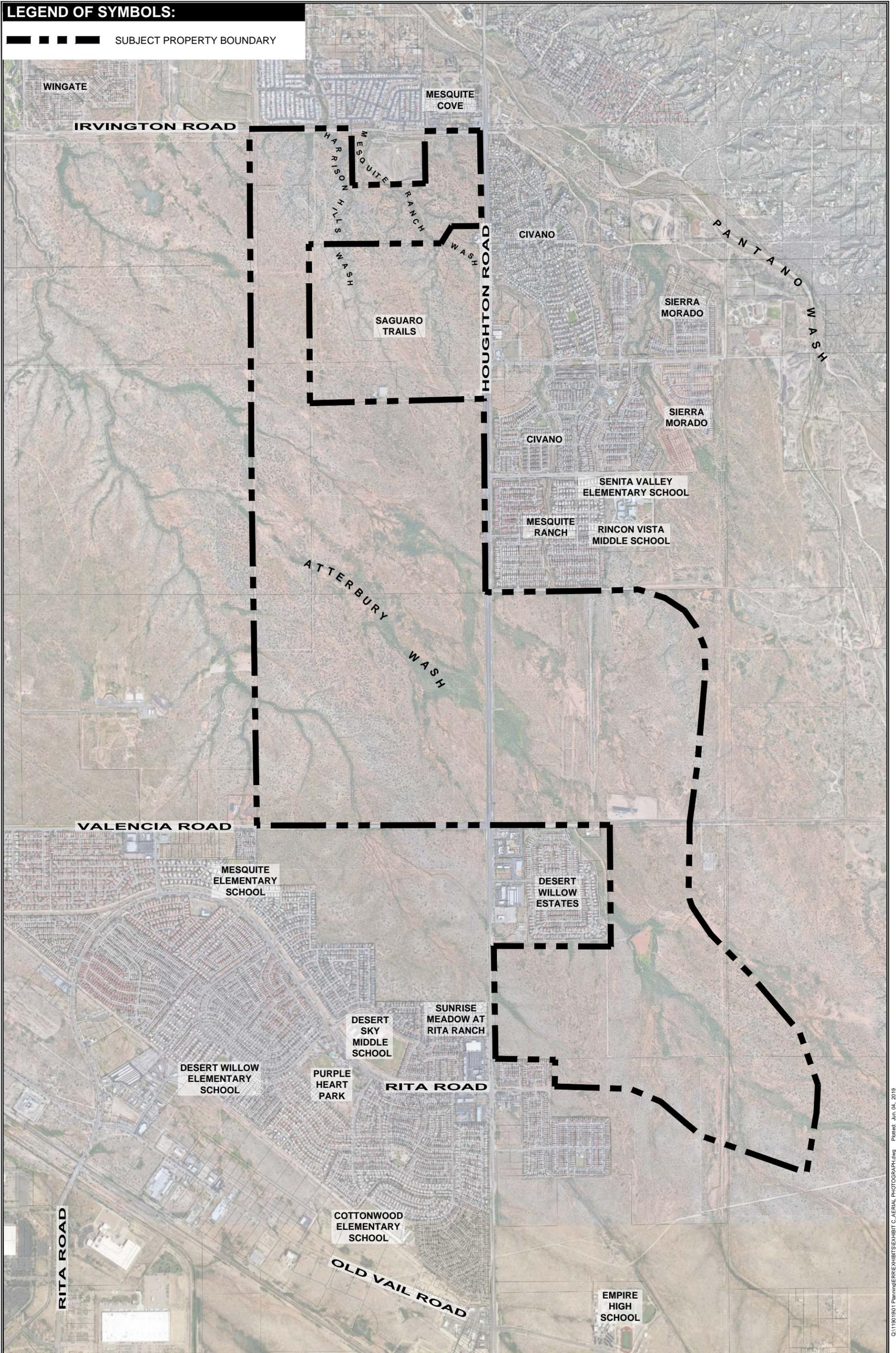
**Exhibit B: CRITICAL AND SENSITIVE WILDLIFE HABITATS OF EASTERN PIMA COUNTY**

Aerial Photo Date: 2017



**LEGEND OF SYMBOLS:**

— — — — — SUBJECT PROPERTY BOUNDARY



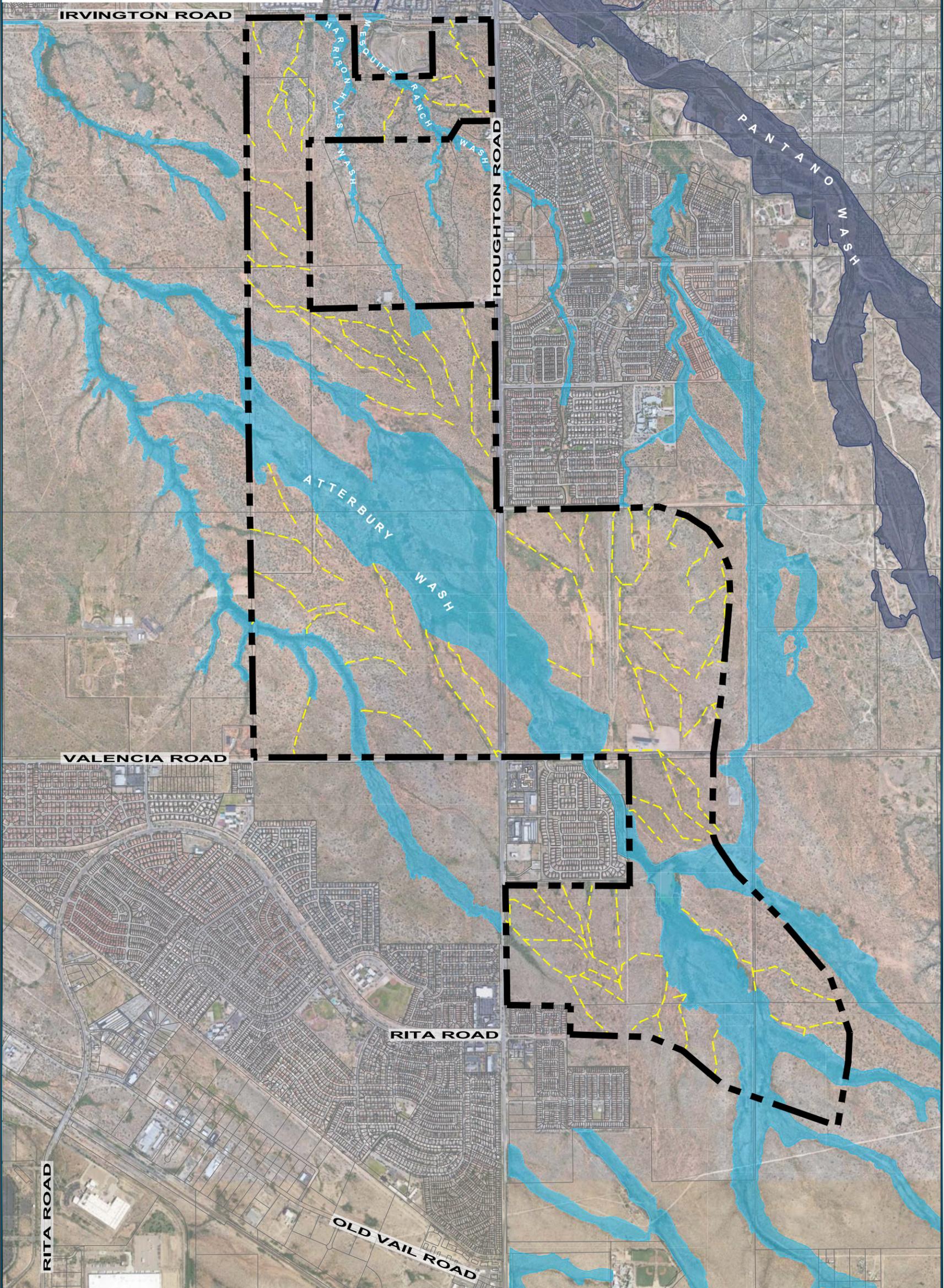
**Exhibit C: AERIAL PHOTOGRAPH**

Aerial Photo Date: 2017



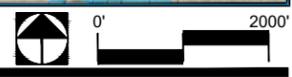
**LEGEND OF SYMBOLS:**

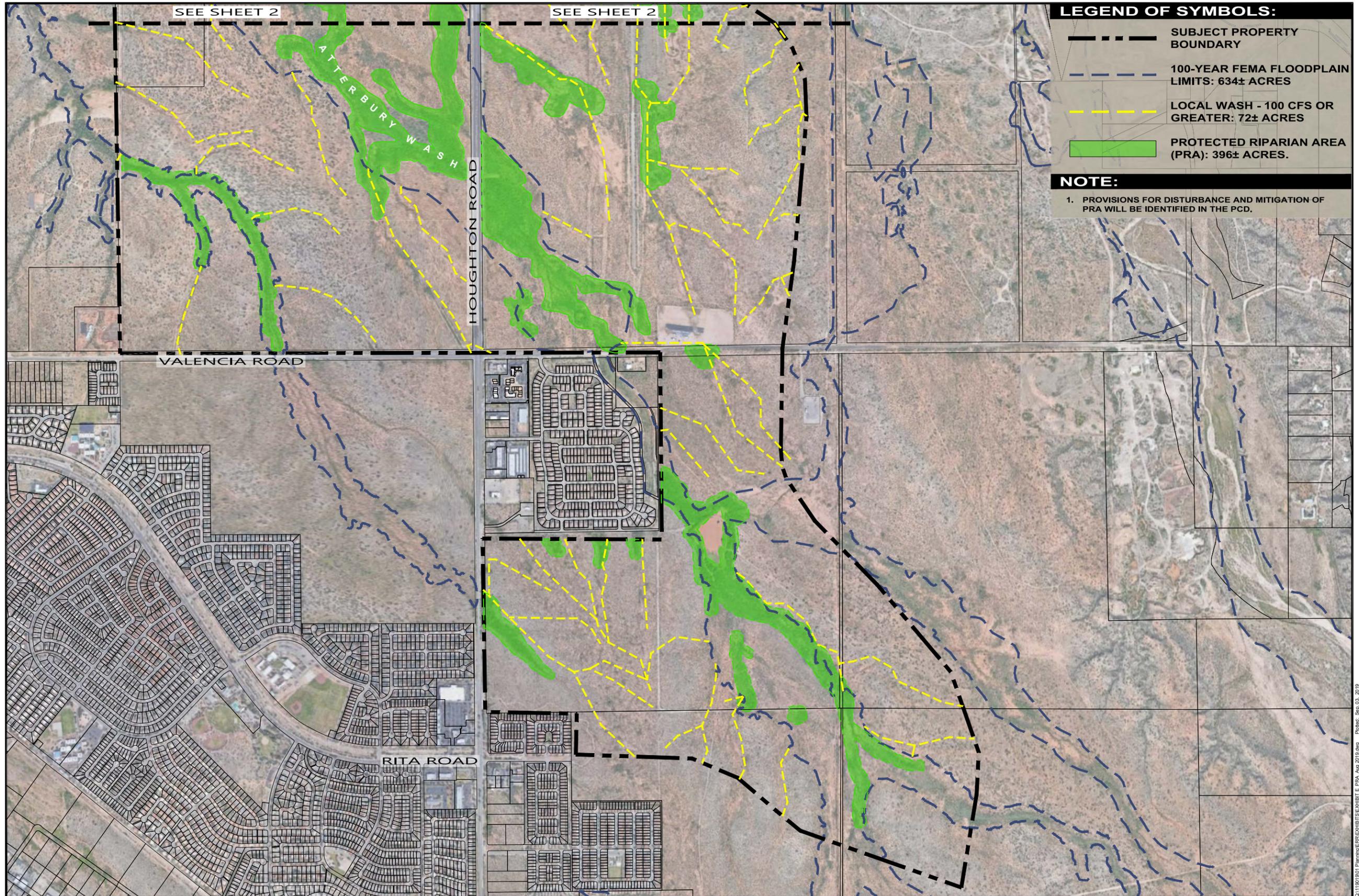
- FEMA 100-YEAR FLOODPLAIN ZONE A
- FEMA 100-YEAR FLOODPLAIN ZONE AE
- LOCAL WASH - 100 CFS OR GREATER
- SUBJECT PROPERTY BOUNDARY



G:\11901901 Planning\ER\RES\HBIT\_D\_100-YEAR\_FLOODPLAIN.dwg Plotter: Sep. 03, 2019

**Exhibit D: 100-YEAR FLOODPLAINS**

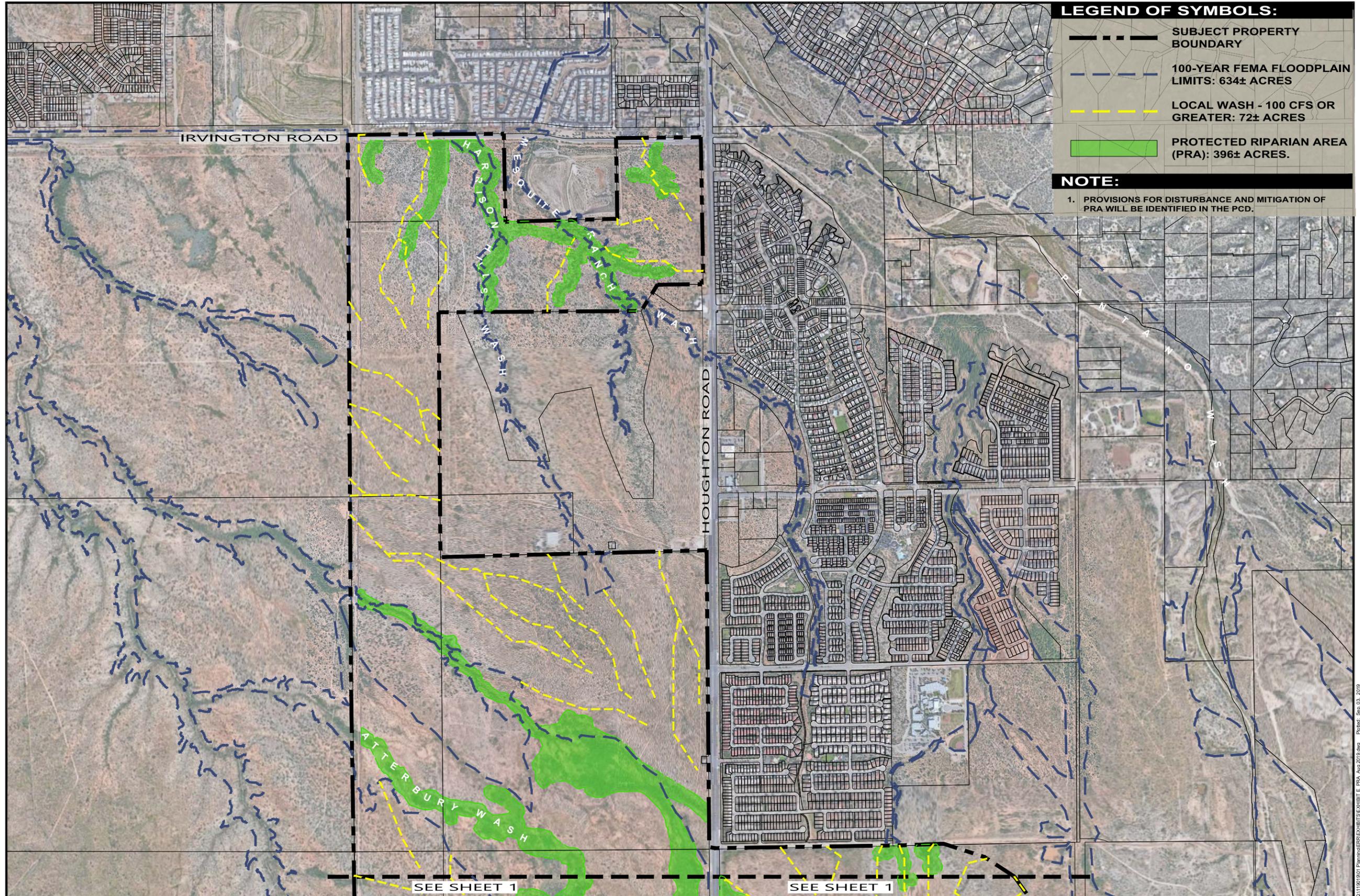




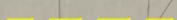
**Exhibit E: PROTECTED RIPARIAN AREA**

Aerial Photo Date: 2017 8.30.2019

C:\119019\001\_Plan\ERR\EXHIBITS\EXHIBIT E\_PRA\_Aug\_2019.dwg Plot: Sep 03, 2019



**LEGEND OF SYMBOLS:**

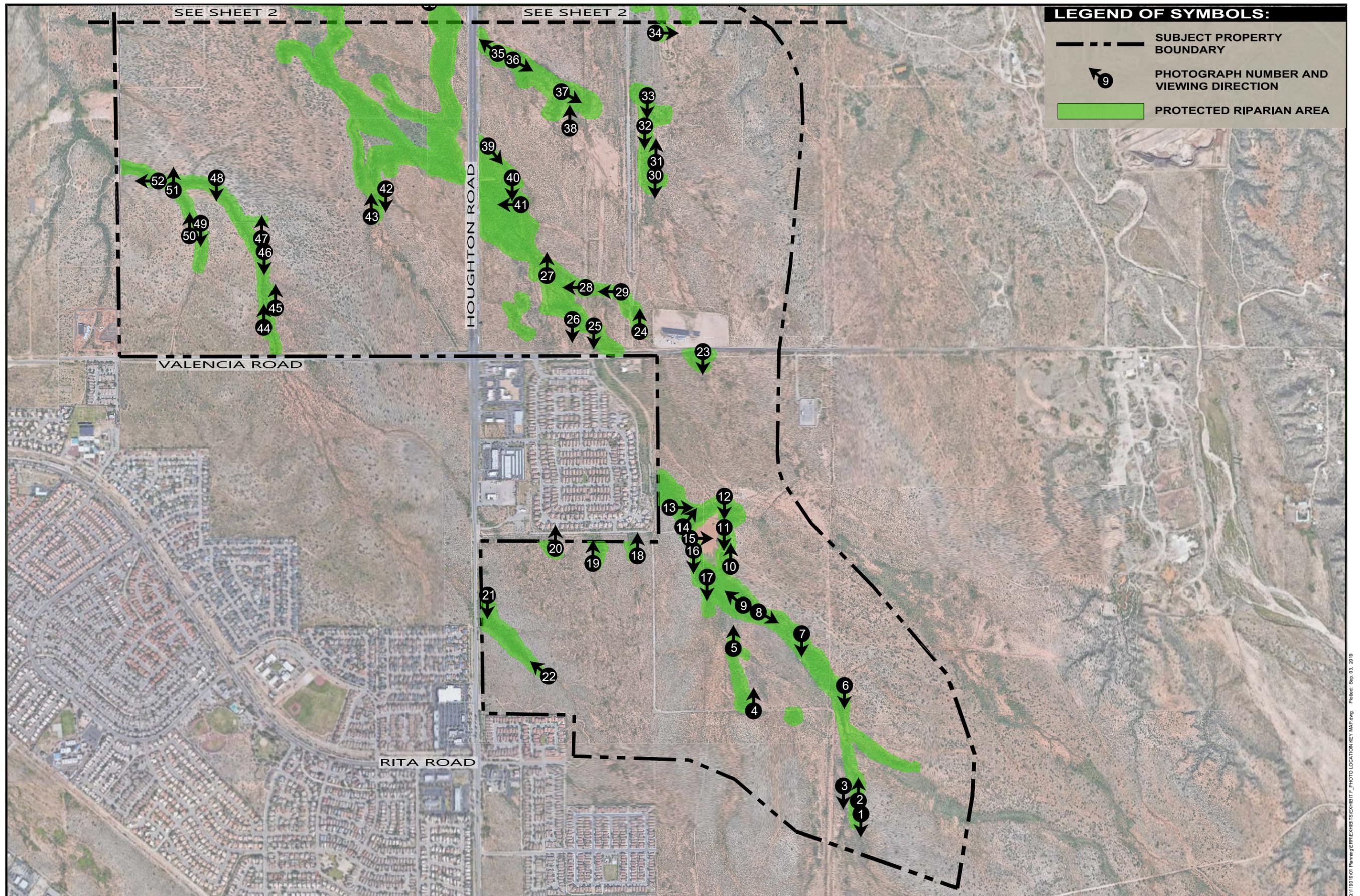
-  SUBJECT PROPERTY BOUNDARY
-  100-YEAR FEMA FLOODPLAIN LIMITS: 634± ACRES
-  LOCAL WASH - 100 CFS OR GREATER: 72± ACRES
-  PROTECTED RIPARIAN AREA (PRA): 396± ACRES.

**NOTE:**

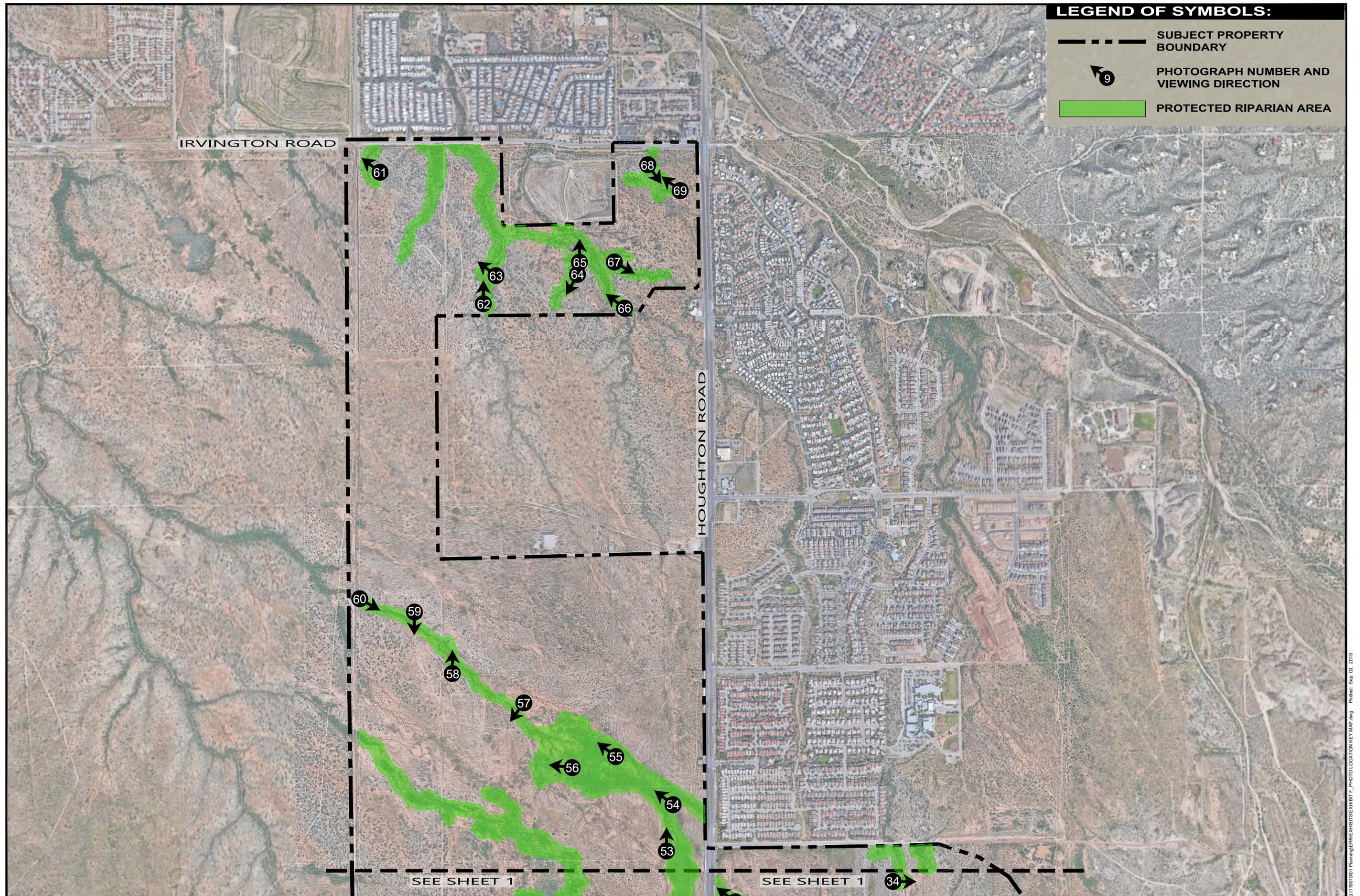
1. PROVISIONS FOR DISTURBANCE AND MITIGATION OF PRA WILL BE IDENTIFIED IN THE PCF.

**Exhibit E: PROTECTED RIPARIAN AREA**

Aerial Photo Date: 2017 8.30.2019  0' 500' 1000' 1500'



**Exhibit F: PHOTOGRAPH LOCATION KEY MAP**



0119019001 Planning/ER/RES/EXHIBIT F\_PHOTO LOCATION KEY MAP.dwg Plotted: Sep. 03, 2019

**Exhibit F: PHOTOGRAPH LOCATION KEY MAP**

Aerial Photo Date: 2017





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### Exhibit G: GROUND LEVEL PHOTOS



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### Exhibit G: GROUND LEVEL PHOTOS



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**Exhibit G: GROUND LEVEL PHOTOS**



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**Exhibit G: GROUND LEVEL PHOTOS**



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**Exhibit G: GROUND LEVEL PHOTOS**



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**Exhibit G: GROUND LEVEL PHOTOS**



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**Exhibit G: GROUND LEVEL PHOTOS**

## APPENDICES

**Appendix A**  
**Arizona Game and Fish Environmental Review Report**

# Arizona Environmental Online Review Tool Report



## *Arizona Game and Fish Department Mission*

*To conserve Arizona's diverse wildlife resources and manage for safe, compatible outdoor recreation opportunities for current and future generations.*

**Project Name:**

ASLD Houghton Road and Valencia Road ERR

**User Project Number:**

119019-A-002

**Project Description:**

Environmental Resource Report

**Project Type:**

Development Within Municipalities (Urban Growth), Residential single dwelling and associated infrastructure, New construction

**Contact Person:**

Chris Ortiz y Pino

**Organization:**

WLB Group, Inc.

**On Behalf Of:**

ASLD

**Project ID:**

HGIS-09228

***Please review the entire report for project type and/or species recommendations for the location information entered. Please retain a copy for future reference.***

**Disclaimer:**

1. This Environmental Review is based on the project study area that was entered. The report must be updated if the project study area, location, or the type of project changes.
2. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area. This review is also not intended to replace environmental consultation (including federal consultation under the Endangered Species Act), land use permitting, or the Departments review of site-specific projects.
3. The Departments Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there. HDMS data contains information about species occurrences that have actually been reported to the Department. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HabiMap Arizona data, specifically Species of Greatest Conservation Need (SGCN) under our State Wildlife Action Plan (SWAP) and Species of Economic and Recreational Importance (SERI), represent potential species distribution models for the State of Arizona which are subject to ongoing change, modification and refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate a refined assessment.

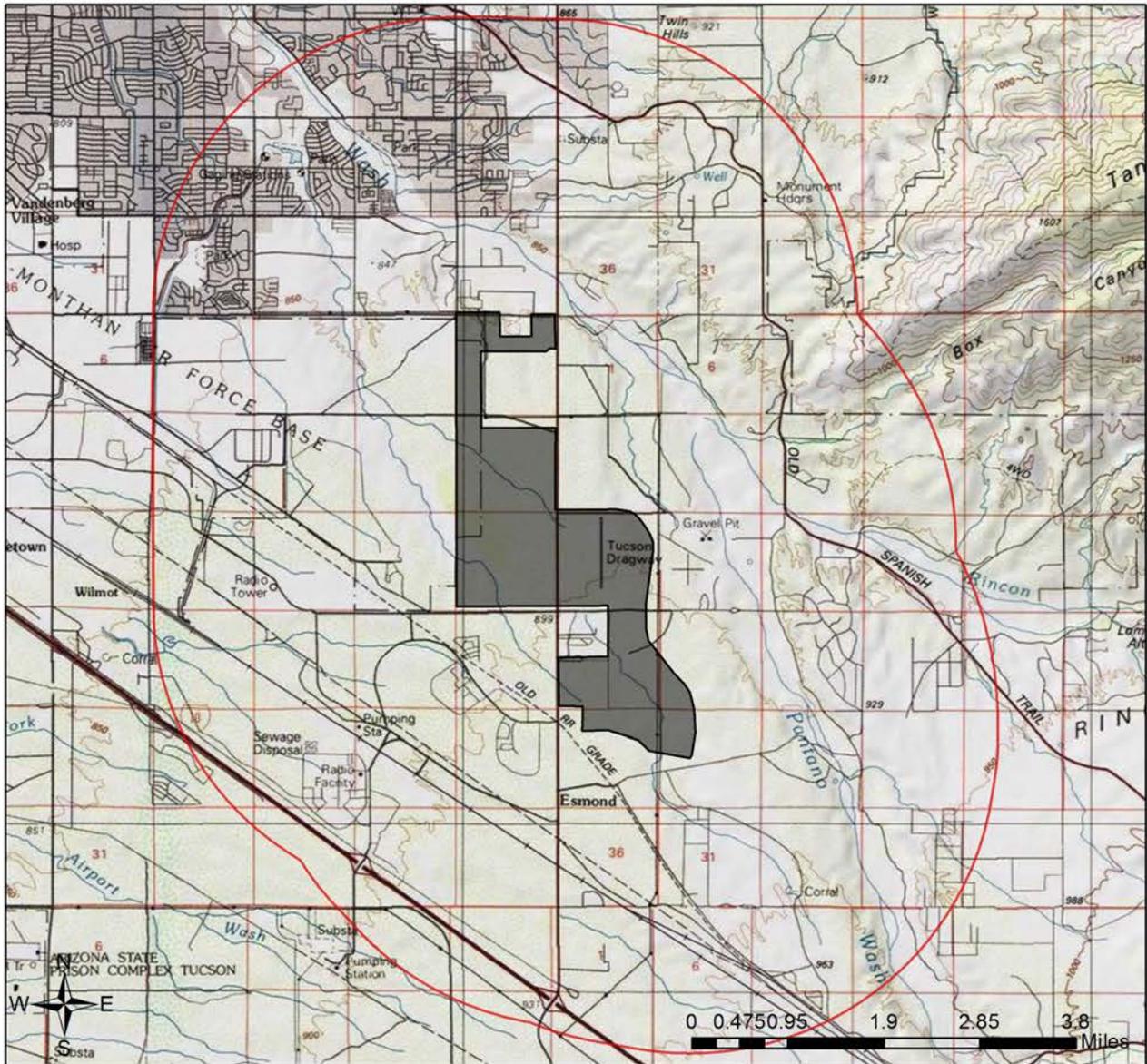
**Locations Accuracy Disclaimer:**

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Report is solely responsible for the project location and thus the correctness of the Project Review Report content.

**Recommendations Disclaimer:**

1. The Department is interested in the conservation of all fish and wildlife resources, including those species listed in this report and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.
2. Recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation).
3. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project. These recommendations are preliminary in scope, designed to provide early considerations on all species of wildlife.
4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.
5. Further coordination with the Department requires the submittal of this Environmental Review Report with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map). Once AGFD had received the information, please allow 30 days for completion of project reviews. Send requests to:  
**Project Evaluation Program, Habitat Branch**  
**Arizona Game and Fish Department**  
**5000 West Carefree Highway**  
**Phoenix, Arizona 85086-5000**  
**Phone Number: (623) 236-7600**  
**Fax Number: (623) 236-7366**  
**Or**  
[PEP@azgfd.gov](mailto:PEP@azgfd.gov)
6. Coordination may also be necessary under the National Environmental Policy Act (NEPA) and/or Endangered Species Act (ESA). Site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies

## ASLD Houghton Road and Valencia Road ERR USA Topo Basemap With Locator Map



- Project Boundary
- Buffered Project Boundary

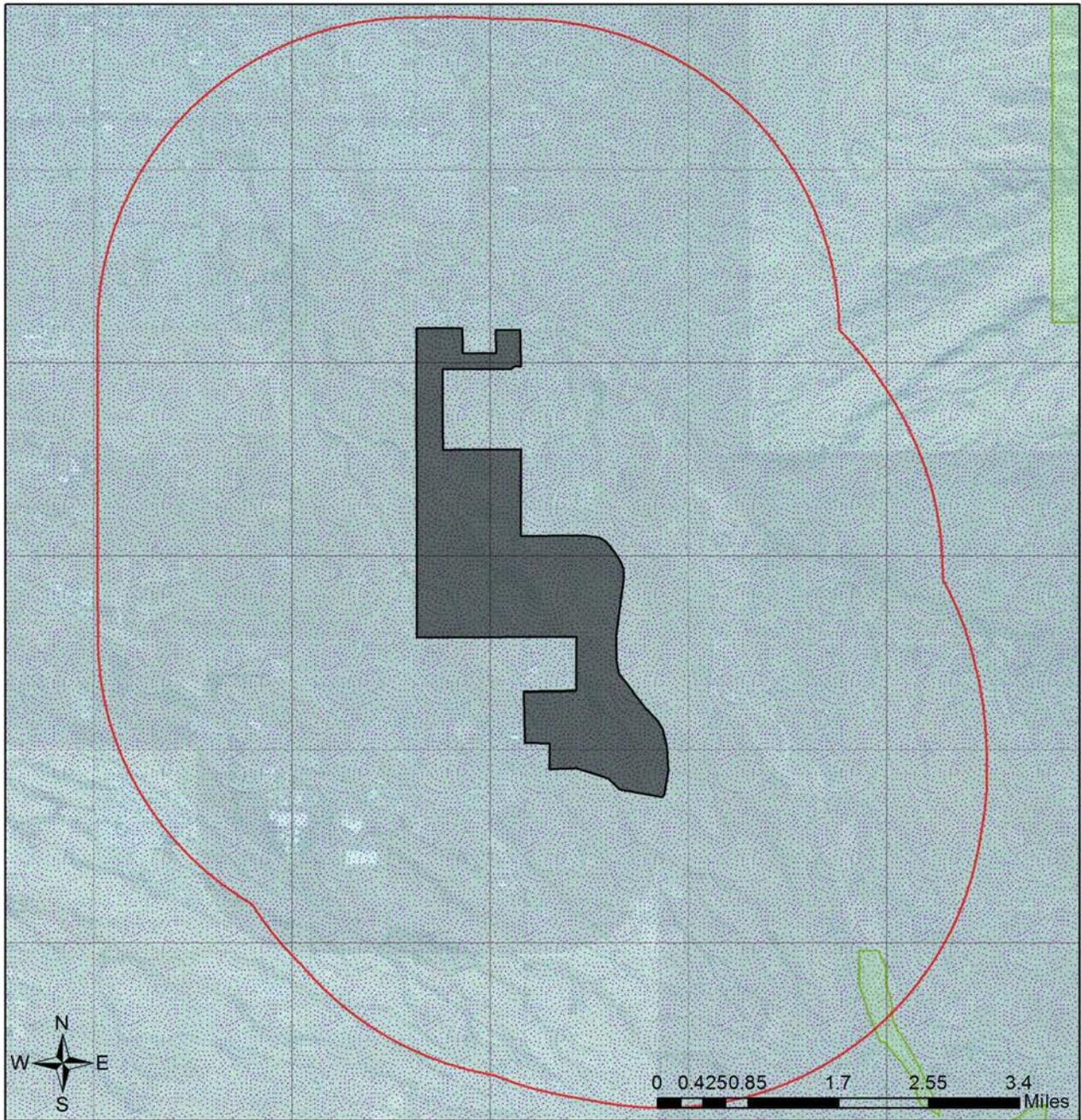
Project Size (acres): 2,806.74  
 Lat/Long (DD): 32.1268 / -110.7725  
 County(s): Pima  
 AGFD Region(s): Tucson  
 Township/Range(s): T15S, R15E; T15S, R16E  
 USGS Quad(s): TUCSON EAST; TUCSON SE +

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap



# ASLD Houghton Road and Valencia Road ERR

Web Map As Submitted By User



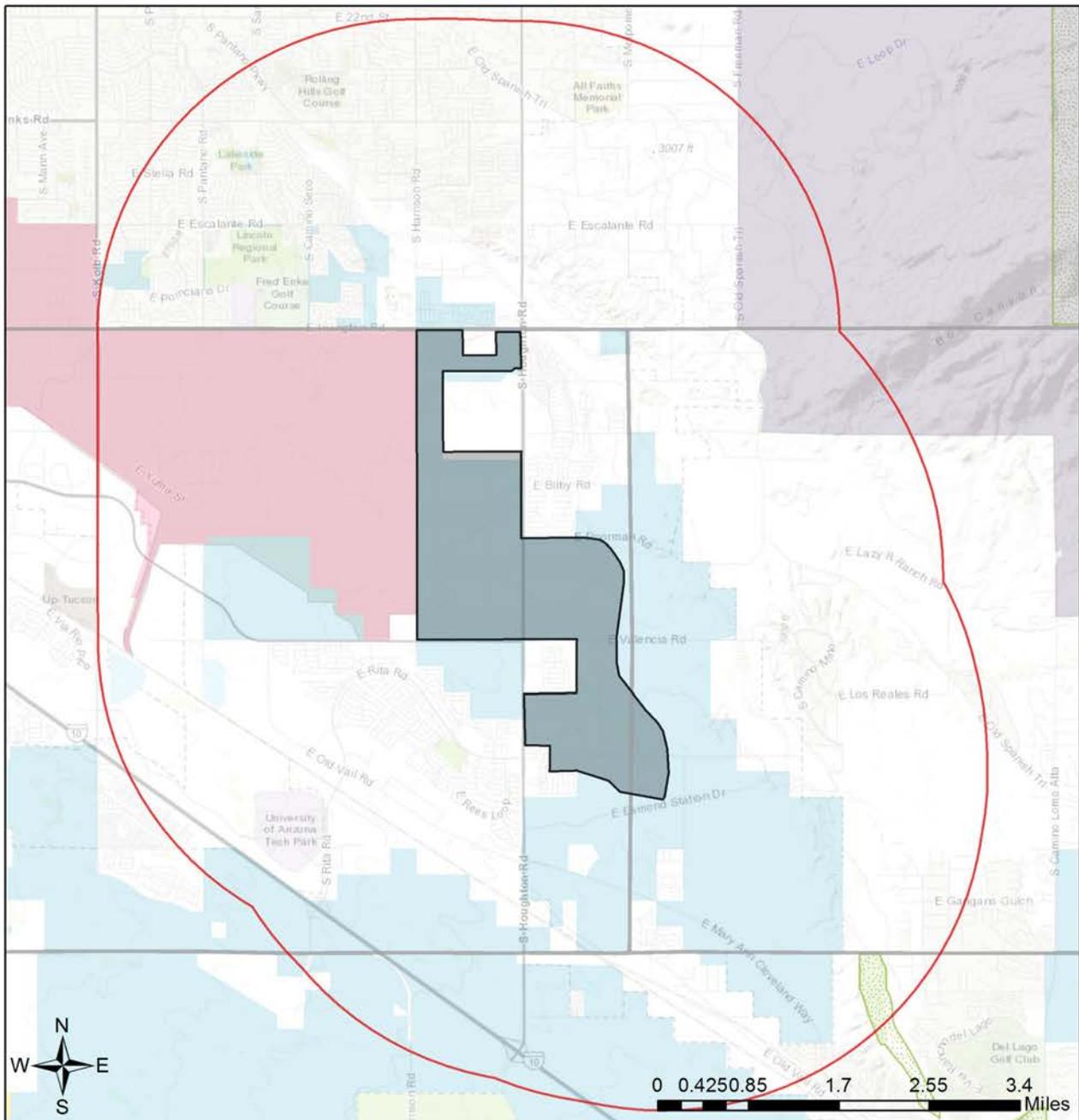
-  Project Boundary
-  Buffered Project Boundary
-  Critical Habitat
-  Special Areas
-  SGCN

Project Size (acres): 2,806.74  
Lat/Long (DD): 32.1268 / -110.7725  
County(s): Pima  
AGFD Region(s): Tucson  
Township/Range(s): T15S, R15E; T15S, R16E  
USGS Quad(s): TUCSON EAST; TUCSON SE +

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community  
Arizona Game and Fish Department

# ASLD Houghton Road and Valencia Road ERR

Topo Basemap with Township/Ranges, Land Ownership, Critical Habitats, Wildlife Corridors



Project Boundary	Indian Res.	Project Size (acres): 2,806.74
Buffered Project Boundary	Military	Lat/Long (DD): 32.1268 / -110.7725
Township/Ranges	Mixed/Other	County(s): Pima
Wildlife Corridors	National Park/Mon.	AGFD Region(s): Tucson
Critical Habitat	Private	Township/Range(s): T15S, R15E; T15S, R16E
<b>Land Ownership</b>	State & Regional Parks	USGS Quad(s): TUCSON EAST; TUCSON SE +
AZ Game & Fish Dept.	State Trust	
BLM	US Forest Service	
BOR	Wildlife Area/Refuge	

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

**Special Status Species and Special Areas Documented within 3 Miles of Project Vicinity**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Bat Colony						
Choeronycteris mexicana	Mexican Long-tongued Bat	SC	S	S		1C
Coryphantha scheeri var. robustispina	Pima Pineapple Cactus	LE			HS	
Falco peregrinus anatum	American Peregrine Falcon	SC	S	S		1A
Gopherus morafkai	Sonoran Desert Tortoise	CCA	S	S		1A
Heloderma suspectum suspectum	Reticulate Gila Monster					1A
Heloderma suspectum	Gila Monster					1A
Lasiurus xanthinus	Western Yellow Bat		S			1B
Leptonycteris yerbabuenae	Lesser Long-nosed Bat	SC				1A
Lithobates yavapaiensis	Lowland Leopard Frog	SC	S	S		1A
Lysiloma watsonii	Littleleaf False Tamarind				SR	
Myotis velifer	Cave Myotis	SC		S		1B
Notiosorex cockrumi	Cockrum's Desert Shrew					1B
Opuntia versicolor	Stag-horn Cholla				SR	
PCH for Thamnophis eques megalops	Northern Mexican Gartersnake Proposed Critical Habitat					
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Terrapene ornata luteola	Desert Box Turtle			S		1A

Note: Status code definitions can be found at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/statusdefinitions/>

**Species of Greatest Conservation Need  
 Predicted within 3 Miles of Project Vicinity based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Agosia chrysogaster	Longfin Dace	SC		S		1B
Aix sponsa	Wood Duck					1B
Amazilia violiceps	Violet-crowned Hummingbird		S			1B
Ammodramus savannarum perpallidus	Western Grasshopper Sparrow					1B
Ammospermophilus harrisii	Harris' Antelope Squirrel					1B
Anthus spragueii	Sprague's Pipit	SC				1A
Antrostomus ridgwayi	Buff-collared Nightjar		S			1B
Aquila chrysaetos	Golden Eagle	BGA		S		1B
Aspidoscelis stictogramma	Giant Spotted Whiptail	SC	S			1B
Aspidoscelis xanthonota	Red-backed Whiptail	SC	S			1B
Athene cunicularia hypugaea	Western Burrowing Owl	SC	S	S		1B
Botaurus lentiginosus	American Bittern					1B
Buteo regalis	Ferruginous Hawk	SC		S		1B

**Species of Greatest Conservation Need  
 Predicted within 3 Miles of Project Vicinity based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Buteo swainsoni</i>	Swainson's Hawk					1C
<i>Calypte costae</i>	Costa's Hummingbird					1C
<i>Catostomus clarkii</i>	Desert Sucker	SC	S	S		1B
<i>Chilomeniscus stramineus</i>	Variable Sandsnake					1B
<i>Cistothorus palustris</i>	Marsh Wren					1C
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo (Western DPS)	LT	S			1A
<i>Colaptes chrysoides</i>	Gilded Flicker			S		1B
<i>Coluber bilineatus</i>	Sonoran Whipsnake					1B
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend's Big-eared Bat	SC	S	S		1B
<i>Crotalus cerberus</i>	Arizona Black Rattlesnake					1B
<i>Crotalus tigris</i>	Tiger Rattlesnake					1B
<i>Cynanthus latirostris</i>	Broad-billed Hummingbird		S			1B
<i>Cynomys ludovicianus</i>	Black-tailed Prairie Dog	CCA		S		1A
<i>Cyrtonyx montezumae</i>	Montezuma Quail					1C
<i>Dipodomys spectabilis</i>	Banner-tailed Kangaroo Rat			S		1B
<i>Empidonax wrightii</i>	Gray Flycatcher					1C
<i>Euderma maculatum</i>	Spotted Bat	SC	S	S		1B
<i>Eumops perotis californicus</i>	Greater Western Bonneted Bat	SC		S		1B
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC	S	S		1A
<i>Glaucidium brasilianum cactorum</i>	Cactus Ferruginous Pygmy-owl	SC	S	S		1B
<i>Glaucidium gnoma gnoma</i>	Mountain Pygmy-owl					1B
<i>Gopherus morafkai</i>	Sonoran Desert Tortoise	CCA	S	S		1A
<i>Haliaeetus leucocephalus</i>	Bald Eagle	SC, BGA	S	S		1A
<i>Heloderma suspectum</i>	Gila Monster					1A
<i>Hypsiglena sp. nov.</i>	Hooded Nightsnake					1B
<i>Incilius alvarius</i>	Sonoran Desert Toad					1B
<i>Kinosternon sonoriense sonoriense</i>	Desert Mud Turtle			S		1B
<i>Lasiurus blossevillii</i>	Western Red Bat		S			1B
<i>Lasiurus xanthinus</i>	Western Yellow Bat		S			1B
<i>Leopardus pardalis</i>	Ocelot	LE				1A
<i>Leptonycteris yerbabuenae</i>	Lesser Long-nosed Bat	SC				1A
<i>Lepus alleni</i>	Antelope Jackrabbit					1B
<i>Lithobates yavapaiensis</i>	Lowland Leopard Frog	SC	S	S		1A
<i>Macrotus californicus</i>	California Leaf-nosed Bat	SC		S		1B
<i>Melanerpes uropygialis</i>	Gila Woodpecker					1B
<i>Meleagris gallopavo mexicana</i>	Gould's Turkey		S			1B
<i>Melospiza lincolni</i>	Lincoln's Sparrow					1B
<i>Melospiza aberti</i>	Abert's Towhee		S			1B

**Species of Greatest Conservation Need  
 Predicted within 3 Miles of Project Vicinity based on Predicted Range Models**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Micrathene whitneyi	Elf Owl					1C
Micruroides euryxanthus	Sonoran Coralsnake					1B
Myiarchus tyrannulus	Brown-crested Flycatcher					1C
Myotis occultus	Arizona Myotis	SC		S		1B
Myotis velifer	Cave Myotis	SC		S		1B
Myotis yumanensis	Yuma Myotis	SC				1B
Nyctinomops femorosaccus	Pocketed Free-tailed Bat					1B
Odocoileus virginianus	White-tailed Deer					1B
Oreoscoptes montanus	Sage Thrasher					1C
Oreothlypis luciae	Lucy's Warbler					1C
Panthera onca	Jaguar	LE				1A
Passerculus sandwichensis	Savannah Sparrow					1B
Peucaea botterii arizonae	Arizona Botteri's Sparrow			S		1B
Peucaea carpalis	Rufous-winged Sparrow					1B
Phrynosoma solare	Regal Horned Lizard					1B
Phyllorhynchus browni	Saddled Leaf-nosed Snake					1B
Poeciliopsis occidentalis occidentalis	Gila Topminnow	LE				1A
Progne subis hesperia	Desert Purple Martin			S		1B
Setophaga petechia	Yellow Warbler					1B
Sphyrapicus nuchalis	Red-naped Sapsucker					1C
Spizella atrogularis	Black-chinned Sparrow					1C
Spizella breweri	Brewer's Sparrow					1C
Sturnella magna	Eastern Meadowlark					1C
Tadarida brasiliensis	Brazilian Free-tailed Bat					1B
Terrapene ornata	Ornate Box Turtle					1A
Thomomys umbrinus intermedius	Southern Pocket Gopher					1B
Toxostoma lecontei	LeConte's Thrasher			S		1B
Troglodytes pacificus	Pacific Wren					1B
Vireo bellii arizonae	Arizona Bell's Vireo					1B
Vulpes macrotis	Kit Fox	No Status				1B

**Species of Economic and Recreation Importance Predicted within 3 Miles of Project Vicinity**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Callipepla gambelii	Gambel's Quail					
Callipepla squamata	Scaled Quail					1C
Odocoileus hemionus	Mule Deer					
Odocoileus virginianus	White-tailed Deer					1B

**Species of Economic and Recreation Importance Predicted within 3 Miles of Project Vicinity**

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Patagioenas fasciata	Band-tailed Pigeon					1C
Pecari tajacu	Javelina					
Puma concolor	Mountain Lion					
Zenaida asiatica	White-winged Dove					
Zenaida macroura	Mourning Dove					

**Project Type: Development Within Municipalities (Urban Growth), Residential single dwelling and associated infrastructure, New construction**

**Project Type Recommendations:**

Fence recommendations will be dependant upon the goals of the fence project and the wildlife species expected to be impacted by the project. General guidelines for ensuring wildlife-friendly fences include: barbless wire on the top and bottom with the maximum fence height 42", minimum height for bottom 16". Modifications to this design may be considered for fencing anticipated to be routinely encountered by elk, bighorn sheep or pronghorn (e.g., Pronghorn fencing would require 18" minimum height on the bottom). Please refer to the Department's Fencing Guidelines located on Wildlife Friendly Guidelines page, which is part of the Wildlife Planning button at <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife. Guidelines for many of these can be found at: <https://www.azgfd.com/wildlife/planning/wildlifeguidelines/>.

Consider impacts of outdoor lighting on wildlife and develop measures or alternatives that can be taken to increase human safety while minimizing potential impacts to wildlife. Conduct wildlife surveys to determine species within project area, and evaluate proposed activities based on species biology and natural history to determine if artificial lighting may disrupt behavior patterns or habitat use. Use only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, canted, or cut to ensure that light reaches only areas needing illumination.

Minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g., microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g., livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants, <https://agriculture.az.gov/>. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control, <http://www.usda.gov/wps/portal/usdahome>. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information <https://www.azgfd.com/hunting/regulations>.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

Based on the project type entered, coordination with State Historic Preservation Office may be required (<http://azstateparks.com/SHPO/index.html>).

Trenches should be covered or back-filled as soon as possible. Incorporate escape ramps in ditches or fencing along the perimeter to deter small mammals and herptefauna (snakes, lizards, tortoise) from entering ditches.

Based on the project type entered, coordination with Arizona Department of Water Resources may be required (<http://www.azwater.gov/azdwr/default.aspx>).

Based on the project type entered, coordination with U.S. Army Corps of Engineers may be required (<http://www.usace.army.mil/>)

Based on the project type entered, coordination with County Flood Control district(s) may be required.

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

**Project Location and/or Species Recommendations:**

HDMS records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area. Please contact:

Arizona Department of Agriculture  
1688 W Adams St.  
Phoenix, AZ 85007  
Phone: 602.542.4373

<https://agriculture.az.gov/environmental-services/np1>

HDMS records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project. The Endangered Species Act (ESA) gives the US Fish and Wildlife Service (USFWS) regulatory authority over all federally listed species. Please contact USFWS Ecological Services Offices at <http://www.fws.gov/southwest/es/arizona/> or:

**Phoenix Main Office**

2321 W. Royal Palm Rd, Suite 103  
Phoenix, AZ 85021  
Phone: 602-242-0210  
Fax: 602-242-2513

**Tucson Sub-Office**

201 N. Bonita Suite 141  
Tucson, AZ 85745  
Phone: 520-670-6144  
Fax: 520-670-6155

**Flagstaff Sub-Office**

SW Forest Science Complex  
2500 S. Pine Knoll Dr.  
Flagstaff, AZ 86001  
Phone: 928-556-2157  
Fax: 928-556-2121

HDMS records indicate that Western Burrowing Owls have been documented within the vicinity of your project area. Please review the western burrowing owl resource page at: <https://www.azgfd.com/wildlife/speciesofgreatestconservneed/burrowingowlmanagement/>.

HDMS records indicate that Sonoran Desert Tortoise have been documented within the vicinity of your project area. Please review the Tortoise Handling Guidelines found at: <https://www.azgfd.com/wildlife/nongamemanagement/tortoise/>

**Appendix B**  
**National Resources Conservation Service Custom Soils Report**



United States  
Department of  
Agriculture

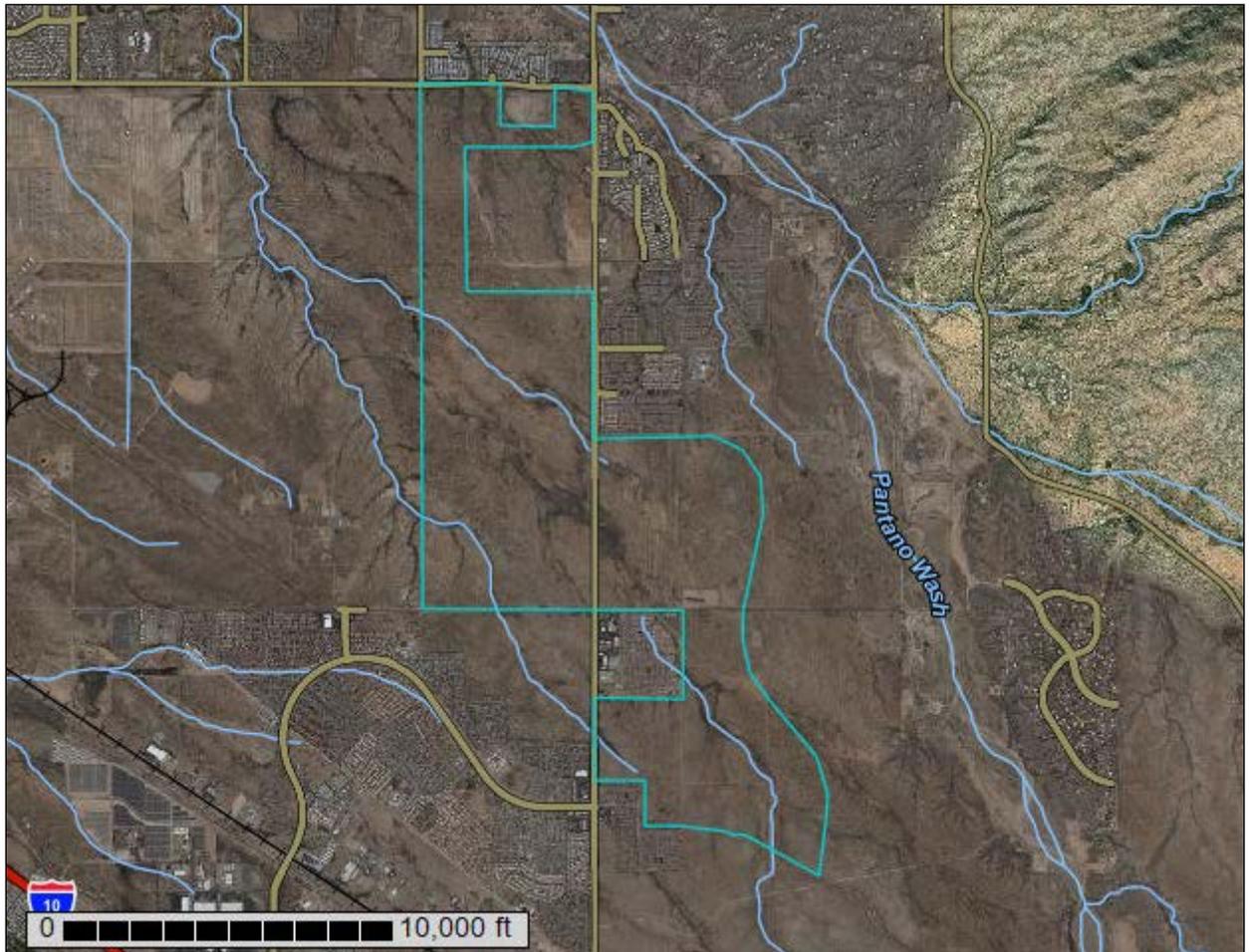
**NRCS**

Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for Pima County, Arizona, Eastern Part

## ASLD Houghton Road and Valencia Road Environmental Resource Report



# Preface

---

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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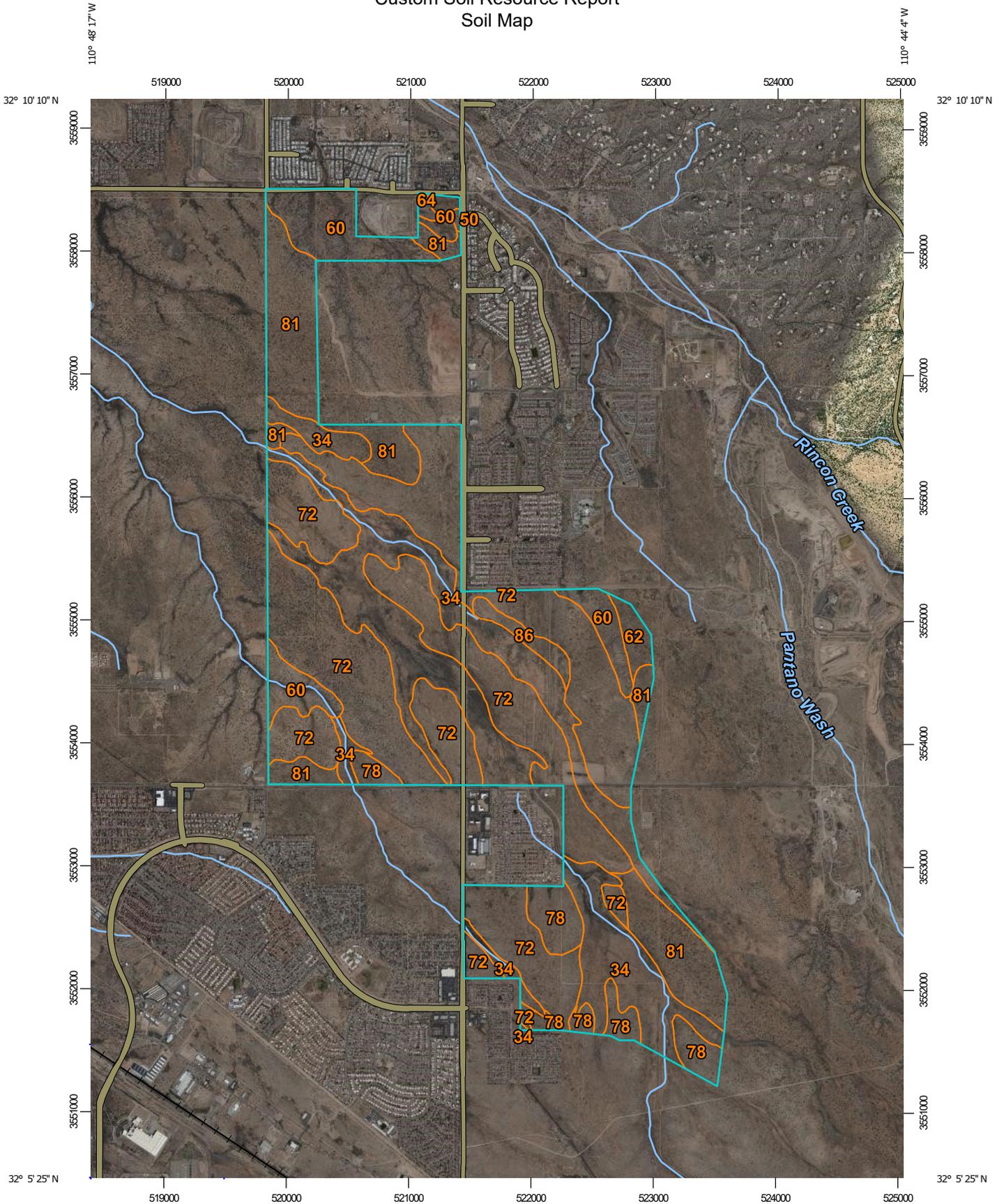
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

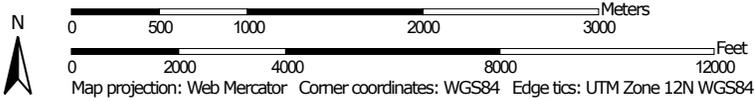
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The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map



Map Scale: 1:42,800 if printed on A portrait (8.5" x 11") sheet.



### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)

**Soils**

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

**Special Point Features**

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

**Water Features**

 Streams and Canals

**Transportation**

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pima County, Arizona, Eastern Part  
 Survey Area Data: Version 15, Sep 15, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2018—May 1, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
34	Hantz loam, 0 to 1 percent slopes	701.8	25.4%
50	Nahda very cobbly loam, 2 to 8 percent slopes	2.5	0.1%
60	Pinaleno-Stagecoach complex, 5 to 16 percent slopes	223.3	8.1%
62	Pinaleno very cobbly sandy loam, 1 to 8 percent slopes	27.9	1.0%
64	Pits, dumps	5.7	0.2%
72	Sahuarita soils, mohave soils and urban land, 1 to 5 percent slopes	1,248.0	45.2%
78	Stagecoach-Sahuarita association, 1 to 8 percent slopes	138.5	5.0%
81	Tubac gravelly loam, 1 to 8 percent slopes	379.8	13.8%
86	Yaqui fine sandy loam, 1 to 3 percent slopes	30.7	1.1%
<b>Totals for Area of Interest</b>		<b>2,758.2</b>	<b>100.0%</b>

## Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

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management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## Pima County, Arizona, Eastern Part

### 34—Hantz loam, 0 to 1 percent slopes

#### Map Unit Setting

*National map unit symbol:* 1t00

*Elevation:* 2,400 to 3,600 feet

*Mean annual precipitation:* 10 to 12 inches

*Mean annual air temperature:* 64 to 70 degrees F

*Frost-free period:* 220 to 280 days

*Farmland classification:* Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

#### Map Unit Composition

*Hantz and similar soils:* 80 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Hantz

##### Setting

*Landform:* Swales, flood plains, alluvial fans

*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread, dip

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Mixed alluvium

##### Typical profile

*A1 - 0 to 5 inches:* loam

*A2 - 5 to 12 inches:* clay loam

*C1 - 12 to 45 inches:* clay

*C2 - 45 to 60 inches:* clay

##### Properties and qualities

*Slope:* 0 to 1 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Runoff class:* Medium

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* Occasional

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 10 percent

*Gypsum, maximum in profile:* 4 percent

*Salinity, maximum in profile:* Nonsaline to moderately saline (0.0 to 8.0 mmhos/cm)

*Sodium adsorption ratio, maximum in profile:* 13.0

*Available water storage in profile:* Moderate (about 8.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 3w

*Land capability classification (nonirrigated):* 7w

*Hydrologic Soil Group:* C

*Ecological site:* Clayey Swale 10-13" p.z. (R040XA102AZ)

*Hydric soil rating:* No

## 50—Nahda very cobbly loam, 2 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 1t0y  
*Elevation:* 2,200 to 3,600 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 64 to 70 degrees F  
*Frost-free period:* 220 to 280 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Nahda and similar soils:* 85 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Nahda

#### Setting

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Alluvium derived from volcanic rock

#### Typical profile

*A - 0 to 5 inches:* very cobbly loam  
*Bt - 5 to 23 inches:* very gravelly clay  
*Btk - 23 to 29 inches:* very gravelly clay loam  
*Bkm - 29 to 60 inches:* cemented material

#### Properties and qualities

*Slope:* 2 to 8 percent  
*Depth to restrictive feature:* 20 to 40 inches to petrocalcic  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 60 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Available water storage in profile:* Very low (about 2.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* D  
*Ecological site:* Clay Loam Upland 10-13" p.z. (R040XA120AZ)

*Hydric soil rating:* No

## **60—Pinaleno-Stagecoach complex, 5 to 16 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 1t11  
*Elevation:* 2,200 to 3,600 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 64 to 70 degrees F  
*Frost-free period:* 220 to 280 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Pinaleno and similar soils:* 40 percent  
*Stagecoach and similar soils:* 35 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Pinaleno**

#### **Setting**

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

#### **Typical profile**

*A - 0 to 2 inches:* very cobbly sandy loam  
*Bt - 2 to 30 inches:* extremely cobbly sandy clay loam  
*Bk - 30 to 60 inches:* extremely gravelly sandy clay loam

#### **Properties and qualities**

*Slope:* 5 to 10 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 35 percent  
*Salinity, maximum in profile:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)  
*Available water storage in profile:* Low (about 3.7 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* Loamy Upland 10-13" p.z. (R040XA114AZ)  
*Hydric soil rating:* No

## Description of Stagecoach

### Setting

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Gravelly mixed alluvium

### Typical profile

*A/Bw - 0 to 10 inches:* very gravelly sandy loam  
*Bk1 - 10 to 19 inches:* very gravelly loam  
*Bk2 - 19 to 40 inches:* extremely gravelly loam  
*2C - 40 to 60 inches:* very gravelly loamy sand

### Properties and qualities

*Slope:* 5 to 16 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 35 percent  
*Gypsum, maximum in profile:* 5 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 13.0  
*Available water storage in profile:* Low (about 3.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A  
*Ecological site:* Limy Upland 10-13" p.z. Deep (R040XA106AZ)  
*Hydric soil rating:* No

## 62—Pinaleno very cobbly sandy loam, 1 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 1t1n  
*Elevation:* 2,200 to 3,450 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 64 to 70 degrees F  
*Frost-free period:* 220 to 280 days  
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Pinaleno and similar soils: 80 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Pinaleno**

**Setting**

*Landform: Fan terraces*

*Landform position (two-dimensional): Summit*

*Landform position (three-dimensional): Tread*

*Down-slope shape: Convex*

*Across-slope shape: Convex*

*Parent material: Mixed alluvium*

**Typical profile**

*A - 0 to 2 inches: very cobbly sandy loam*

*Bt - 2 to 30 inches: extremely cobbly sandy clay loam*

*Bk - 30 to 60 inches: extremely gravelly sandy clay loam*

**Properties and qualities**

*Slope: 1 to 8 percent*

*Depth to restrictive feature: More than 80 inches*

*Natural drainage class: Well drained*

*Runoff class: Medium*

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)*

*Depth to water table: More than 80 inches*

*Frequency of flooding: None*

*Frequency of ponding: None*

*Calcium carbonate, maximum in profile: 35 percent*

*Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)*

*Available water storage in profile: Low (about 3.7 inches)*

**Interpretive groups**

*Land capability classification (irrigated): None specified*

*Land capability classification (nonirrigated): 7s*

*Hydrologic Soil Group: C*

*Ecological site: Loamy Upland 10-13" p.z. (R040XA114AZ)*

*Hydric soil rating: No*

**64—Pits, dumps**

**Map Unit Composition**

*Pits: 40 percent*

*Dumps, stony: 20 percent*

*Dumps, tailings: 15 percent*

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Pits**

**Interpretive groups**

*Land capability classification (irrigated): None specified*

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*Land capability classification (nonirrigated): 8*  
*Hydric soil rating: No*

**Description of Dumps, Stony**

**Interpretive groups**

*Land capability classification (irrigated): None specified*  
*Land capability classification (nonirrigated): 8*  
*Hydric soil rating: No*

**Description of Dumps, Tailings**

**Interpretive groups**

*Land capability classification (irrigated): None specified*  
*Land capability classification (nonirrigated): 8*  
*Hydric soil rating: No*

**72—Sahuarita soils, mohave soils and urban land, 1 to 5 percent slopes**

**Map Unit Setting**

*National map unit symbol: 1t27*  
*Elevation: 2,200 to 2,800 feet*  
*Mean annual precipitation: 10 to 12 inches*  
*Mean annual air temperature: 64 to 70 degrees F*  
*Frost-free period: 220 to 280 days*  
*Farmland classification: Not prime farmland*

**Map Unit Composition**

*Mohave and similar soils: 0 percent*  
*Urban land: 0 percent*  
*Sahuarita and similar soils: 0 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Mohave**

**Setting**

*Landform: Fan terraces*  
*Landform position (two-dimensional): Summit*  
*Landform position (three-dimensional): Tread*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Parent material: Mixed alluvium*

**Typical profile**

*A - 0 to 3 inches: loam*  
*BA - 3 to 6 inches: sandy loam*  
*Btk - 6 to 40 inches: clay loam*  
*C - 40 to 60 inches: loam*

**Properties and qualities**

*Slope: 1 to 5 percent*

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*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 40 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 25.0  
*Available water storage in profile:* High (about 9.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7c  
*Hydrologic Soil Group:* C  
*Ecological site:* Loamy Upland 10-13" p.z. (R040XA114AZ)  
*Hydric soil rating:* No

### Description of Urban Land

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 8  
*Hydric soil rating:* No

### Description of Sahuarita

#### Setting

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

#### Typical profile

*A - 0 to 3 inches:* very gravelly fine sandy loam  
*Bk - 3 to 28 inches:* fine sandy loam  
*2Btkb - 28 to 45 inches:* sandy clay loam  
*2Btb - 45 to 60 inches:* very gravelly sandy clay loam

#### Properties and qualities

*Slope:* 1 to 5 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 35 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

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*Sodium adsorption ratio, maximum in profile:* 3.0  
*Available water storage in profile:* Moderate (about 8.3 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* Limy Fan 10-13" p.z. (R040XA108AZ)  
*Hydric soil rating:* No

## **78—Stagecoach-Sahuarita association, 1 to 8 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 1t2f  
*Elevation:* 2,200 to 3,200 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 64 to 70 degrees F  
*Frost-free period:* 220 to 280 days  
*Farmland classification:* Not prime farmland

### **Map Unit Composition**

*Stagecoach and similar soils:* 50 percent  
*Sahuarita and similar soils:* 25 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Stagecoach**

#### **Setting**

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

#### **Typical profile**

*A/Bw - 0 to 10 inches:* very gravelly sandy loam  
*Bk1 - 10 to 19 inches:* very gravelly loam  
*Bk2 - 19 to 40 inches:* extremely gravelly loam  
*2C - 40 to 60 inches:* very gravelly loamy sand

#### **Properties and qualities**

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None

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*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 35 percent  
*Gypsum, maximum in profile:* 5 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 13.0  
*Available water storage in profile:* Low (about 3.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A  
*Ecological site:* Limy Upland 10-13" p.z. Deep (R040XA106AZ)  
*Hydric soil rating:* No

### Description of Sahuarita

#### Setting

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

#### Typical profile

*A - 0 to 3 inches:* very gravelly fine sandy loam  
*Bk - 3 to 28 inches:* fine sandy loam  
*2Btkb - 28 to 45 inches:* sandy clay loam  
*2Btb - 45 to 60 inches:* very gravelly sandy clay loam

#### Properties and qualities

*Slope:* 1 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 35 percent  
*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 3.0  
*Available water storage in profile:* Moderate (about 8.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* Limy Fan 10-13" p.z. (R040XA108AZ)  
*Hydric soil rating:* No

## 81—Tubac gravelly loam, 1 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 1t2n  
*Elevation:* 2,400 to 3,200 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 64 to 70 degrees F  
*Frost-free period:* 220 to 280 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Tubac and similar soils:* 80 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Tubac

#### Setting

*Landform:* Fan terraces  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

#### Typical profile

*A1 - 0 to 2 inches:* gravelly loam  
*A2 - 2 to 14 inches:* loam  
*Bt - 14 to 31 inches:* clay  
*2Btk - 31 to 60 inches:* gravelly sandy clay loam

#### Properties and qualities

*Slope:* 1 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Medium  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 15 percent  
*Gypsum, maximum in profile:* 1 percent  
*Salinity, maximum in profile:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 10.0  
*Available water storage in profile:* Moderate (about 7.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C

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*Ecological site:* Loamy Upland 10-13" p.z. (R040XA114AZ)  
*Hydric soil rating:* No

### 86—Yaqui fine sandy loam, 1 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 1t2t  
*Elevation:* 2,200 to 3,600 feet  
*Mean annual precipitation:* 10 to 12 inches  
*Mean annual air temperature:* 64 to 70 degrees F  
*Frost-free period:* 220 to 280 days  
*Farmland classification:* Not prime farmland

#### Map Unit Composition

*Yaqui and similar soils:* 80 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Yaqui

##### Setting

*Landform:* Alluvial fans  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Mixed alluvium

##### Typical profile

*A - 0 to 4 inches:* fine sandy loam  
*Bw - 4 to 31 inches:* sandy clay loam  
*2Btb - 31 to 43 inches:* clay loam  
*2Bkb - 43 to 60 inches:* gravelly loam

##### Properties and qualities

*Slope:* 1 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Natural drainage class:* Well drained  
*Runoff class:* Low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.60 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Calcium carbonate, maximum in profile:* 20 percent  
*Gypsum, maximum in profile:* 1 percent  
*Salinity, maximum in profile:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)  
*Sodium adsorption ratio, maximum in profile:* 13.0  
*Available water storage in profile:* Moderate (about 8.9 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7c

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*Hydrologic Soil Group: C*

*Ecological site: Limy Fan 10-13" p.z. (R040XA108AZ)*

*Hydric soil rating: No*

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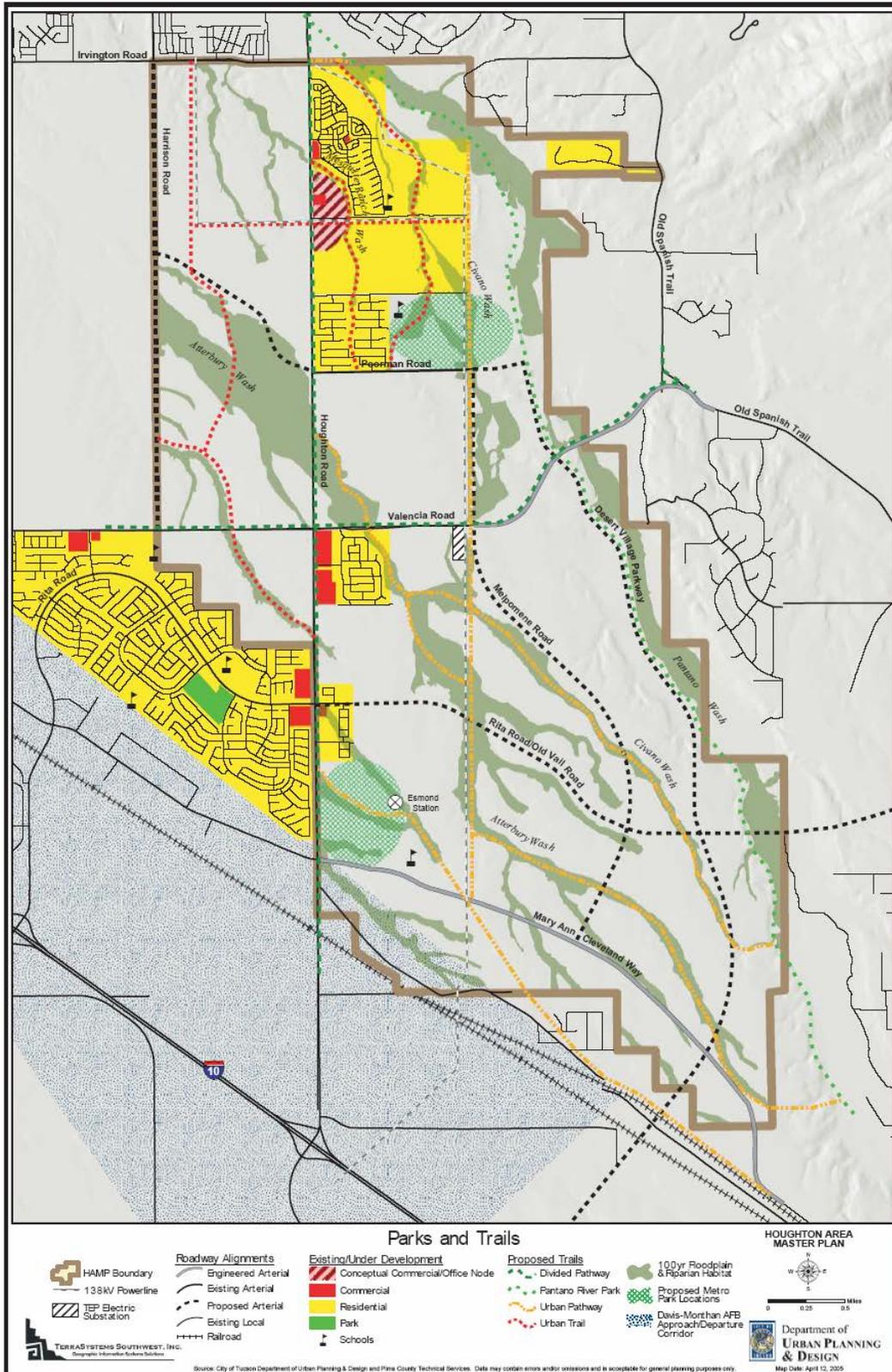
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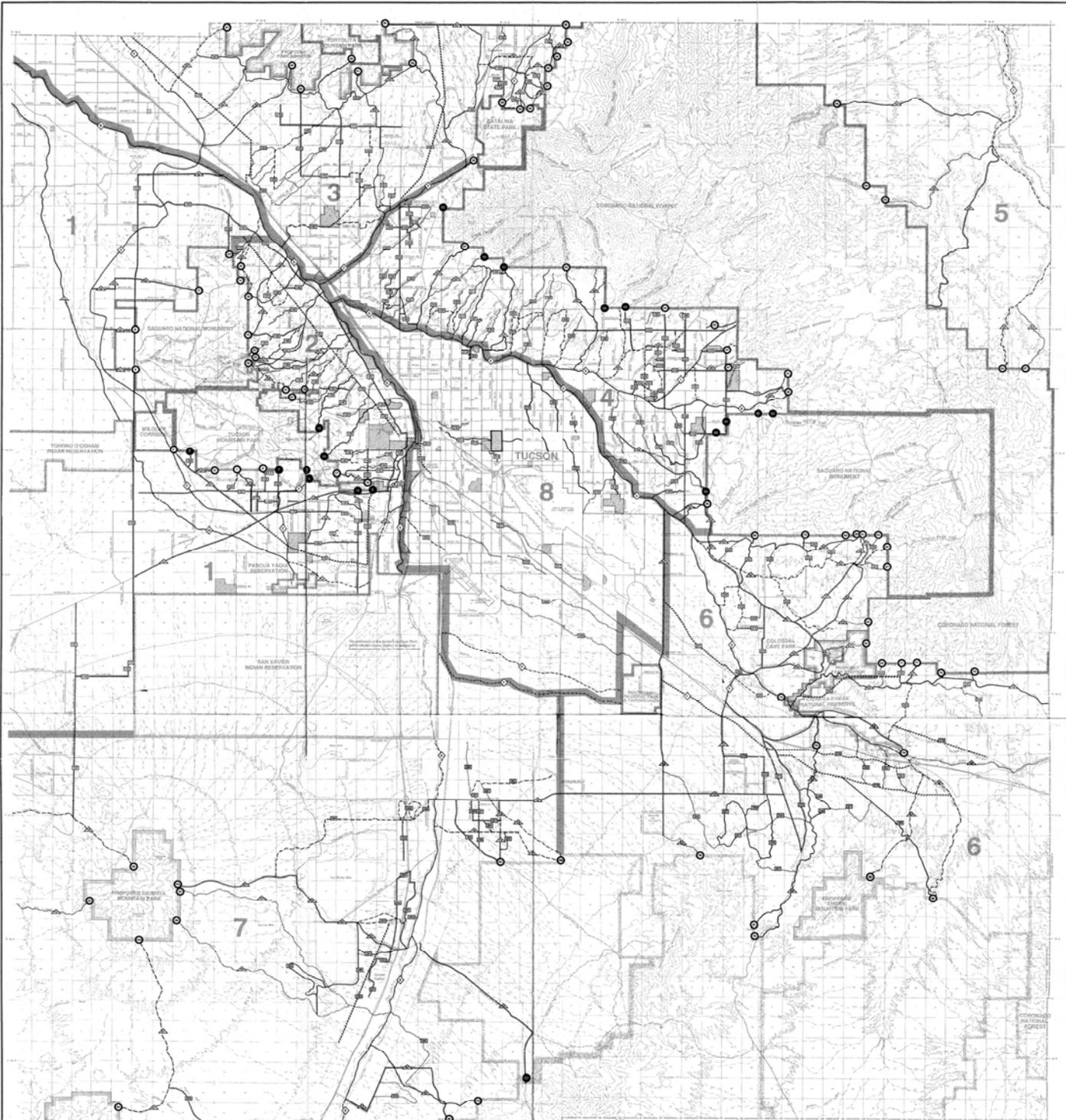
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**Appendix C**  
**Houghton Area Master Plan Parks and Trails Map**

### Exhibit 7 Parks and Trails Map



**Appendix D**  
**Eastern Pima County Trails System Master Plan Map**



Pocket Map #1  
**TRAIL PRIORITIES AND BOUNDARY ACCESS  
 POINTS SELECTED BY SUBREGIONAL PANELS\***

- First Priority Candidate Trail
- - - Second Priority Candidate Trail
- ..... Third Priority Candidate Trail
- - - - Candidate Road Right-of-Way Trail
- ..... Candidate Utility Easement Trail
- ◆ Primary Trail
- ▲ Connector Trail
- Local Trail
- Established
- Proposed
- ▬ Subregion Boundary  
(Numbers 1-8 designate Subregions)

**EASTERN PIMA COUNTY TRAIL SYSTEM MASTER PLAN**

Scale: 1 inch = 1 mile  
 Date: 10/2010  
 Prepared for: Pima County  
 Prepared by: [Firm Name]

NORTHEASTERN  
 BASS AND DEWEES BY  
 PAUL DEWEES  
 DEPARTMENT OF TRANSPORTATION  
 FLOOD CONTROL DISTRICT  
 1000 N. 1ST AVENUE, SUITE 100  
 TUCSON, AZ 85724