

Wilmot Park Rezoning

Site Inventory and Land Use Proposal

September 2016
Second Submittal



Wilmot Park Rezoning

Site Inventory and Land Use Proposal

Submitted To:

**Pima County Development
Services Department**
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Tucson, Arizona 85701

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INTRODUCTION

This document has been prepared on behalf of Andrada Wilmot 180 LLC and provides a comprehensive evaluation of the proposed development in relation to the policies and ordinances of Pima County, including the policies of the Pima County Comprehensive Plan and particularly those relating to smart growth and sustainability.

The project meets all requirements and therefore, the Site Analysis will follow the County guidelines for a Large Project.

This property is located in the southeast metropolitan Tucson area which is currently an area in transition due to recent widening of Sahuarita Road, pending paving improvements to Wilmot Road and the designation of Pima County's Sonoran Corridor as a "High Priority Corridor" on the National Highway System.

The property is situated on the east side of Wilmot Road approximately one mile north of Sahuarita Road. The report documents existing conditions and provides a detailed analysis of our proposed development, consisting of a total of 359 acres. The proposed development is consistent with other recent developments and current development trends in the area.

The County's Comprehensive Plan shows the entire property as Low Intensity Urban 3.0.

The rezoning requested for the property is from Rural Homestead (RH) to CR-5 Multiple Residence Zone (CR-5) with the Small Lot Option. This is consistent with the concept envisioned within the Comprehensive Plan designation of Low Intensity Urban 3.0.

An analysis of recent area rezonings shows several parcels south of this property but north of Sahuarita Road which have all been rezoned to GR-1. All of them have fulfilled all zoning requirements except for the 150-acre Sahuarita Corners project (Co9-07-20) which still has conditional zoning.

The work contained herein is a result of detailed research of the most current information available, numerous site visits and research and analysis from various sources. This report has been prepared following Pima County Development Services' current requirements for a Site Analysis and follows the guidelines outlined in the Rezoning Procedures in Chapter 18.91 of the Pima County Zoning Code.

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INVENTORY AND ANALYSIS

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PART I - EXISTING CONDITIONS

I-A. EXISTING LAND USES

Site Location

This property is in the Southeastern portion of Metropolitan Tucson. The property is on the east side of Wilmot Road and one mile north of Sahuarita Road.

The property consists of a total of four parcels, all of which are owned by Andrada Wilmot 180 LLC, which are subject to this application.

Table 1: PARCEL DATA

Parcel	Acreage	Location
Parcel 305-23-018A	50.01 acres	Section 6 T 17 S, R 15 E
Parcel 305-23-018C	53.31 acres	Section 6 T 17 S, R 15 E
Parcel 305-23-0260	185.64 acres	Section 6 T 17 S, R 15 E
Parcel 305-23-027B	70.00 acres	Section 6 T 17 S, R 15 E
	358.96 acres	

The four parcels combine for a total of approximately 359 acres. These parcels are identified on FIGURE 1.A.1. The portion of Parcel 305-23-018A that extends up to Andrada Road is approximately six acres, is not a part of this rezoning request and will remain under RH zoning. During the initial platting phase, the northern extension of Parcel 305-23-018A will be split into a separate parcel. A surveyable zoning boundary has been included on the PDP.

The current Pima Prospers Comprehensive Plan was amended in 2015 and shows these parcels as Low Intensity Urban 3.0 to Low Intensity Urban 3.0 (LIU-3.0).

Regional Context

This southeastern portion of the Tucson region is one that has been growing over the past couple of decades and has been targeted by Pima County for future growth. There are significant employment centers just eight miles north along Interstate 10. The Tucson Commerce Corridor has been established from Alvernon Way to Houghton Road along Interstate 10 and is being developed to create commercial and industrial growth opportunities with access to interstate, rail and air service. The University of Arizona Science & Technology Park, Tucson's preeminent research park, is located at Rita Road and I-10 as are Arizona Canning Company/La Costeña and the Target Fulfillment Center within Interstate Commerce Park. At Wilmot Road and I-10 there are both federal and State of Arizona prisons as well as the City of Tucson Public Safety Training Academy.

In addition, transportation corridors have been going through a major upgrade to provide better access within the region. Sahuarita Road has been widened to a four lane divided roadway all the way from Interstate 10 to Country Club Road. Pima County is beginning construction of major improvements to Wilmot Road which will create a paved roadway all the way from Interstate 10 to Sahuarita Road. Pima County is also in the planning stage of the development of the Sonoran Corridor which has been recommended to receive designation as a "High Priority Corridor" on the National Highway System. The Corridor lies along the Old Vail Road alignment which is only about 5.5 miles north of the

property and is projected to create a \$32.2 billion annual impact to the regional economy and directly and indirectly support as many 189,000 jobs.

Residential projects such as La Estancia and Sycamore Park have been developed to the north along Interstate 10. Sycamore Springs, Sycamore Canyon, Sycamore Hills, New Tucson and the Santa Rita projects have been developed along Sahuarita Road over the last several decades. At this time, Richmond American Homes, D.R. Horton and Sombra Homes are all working along the Sahuarita corridor between Wilmot and Houghton Roads.

The Wilmot Park property is within the Vail School District. Growth in the area is being driven because of the strength of the district's academic program. Families are choosing to raise their children within this district which is causing a demand that makes Vail School District one of the fastest growing districts in the state. Sycamore Elementary and Corona Foothills Middle School are located in the Santa Rita area, south of Sahuarita Road.

There is a wealth of recreation opportunities in the area. The Pima County Fairgrounds are located just three miles north of the site on Houghton. The Santa Rita Mountains lie to the south with many hiking trails.

UniSource Energy Services (UES) has identified the Wilmot Corridor as an approved route for an upgraded 138-kilovolt (kV) transmission line that will help meet southern Arizona's growing electric needs. The Vail to Valencia Transmission Line will establish a 138kV link between Tucson Electric Power's Vail Substation and UES' Valencia Substation in Nogales.

Significant commercial/retail growth has occurred in the area, which include the following businesses:

- Vista Feed & Supply; 2052 W Sahuarita Road
- American Legion Post #109; 15921 S Houghton Road
- Argenziano's Italian Restaurant; 16251 S Houghton Road
- Roadrunner Deli and Market; 16121 S Houghton Road
- Corona de Tucson Fire Station 181; 99 E Tallahassee Drive
- Corona Commercial Center; 53 E Tallahassee Drive
 - Danzone
 - Hair-A-Zona
 - Arizona Insurance Managers
 - Wallace Rumsey DO
 - Saguaro Physicians
- Corona de Tucson Satellite Office; 16449 S. Houghton Road
- Connie's Cut Above; 16355 S. Houghton Road
- Ace Hardware; 16335 S. Houghton Road
- US Post Office Substation; 16335 S. Houghton Road
- U-Haul; 16355 S. Houghton Road

Existing Land Uses

The property in question is undeveloped. The land adjacent to this site is either vacant and undeveloped or has been developed as unregulated low density home sites. The

adjacent home sites are approximately 80% manufactured homes and 20% conventional housing.

There is an access easement over the westerly sixty feet of the property which includes the current Wilmot Road roadway. In addition, an existing overhead power line is located along the west side of the property in a one hundred-foot wide easement located on the east side of Wilmot Road. There is also a seventy five-foot ingress/egress easement along the southerly boundary line that provides access to residential properties to the east. The approximate locations of these are shown on FIGURE I-A.1a/b.

The property is undeveloped as shown on FIGURE I-A.2a/b and is currently being used for grazing.

Comprehensive Plan Compliance

The entire Property is located within areas that Pima County designated in Pima Prospers as Low Intensity Urban 3.0. This rezoning is for a gross density of less than three homes per acre and therefore complies with the current Plan designation.

Special Policies

The proposed development must comply with:

- Special Area Policy *S18 FLOODPLAIN MANAGEMENT* (Section E-Lee Moore Wash Basin only)
- Rezoning Policy *RP-118 S. Wilmot Road (RS/SR)* (Parcel 305-23-0260 only)

S-18 Floodplain Management

General Location: There are several sites within eastern Pima County designated as Floodplain Management Special Areas by the Pima County Regional Flood Control District. They are: (A) Upper Santa Cruz River; (B) Rillito Creek Overbank Storage; (C) Cienega Creek; (D) Wakefield and Anderson Washes and (E) Lee Moore Wash, including eight tributaries: Gunnery Range Wash, Sycamore Canyon Wash, Fagan Wash, Cuprite Wash, Petty Ranch Wash, Franco Wash, Flato Wash and Summit Wash.

Policies

E. Lee Moore Wash Basin Special Area Policy: Development shall be regulated per the Lee Moore Wash Basin Management Study. This study provides hydrology and hydraulics to ensure consistency between land uses, identifies permanent natural flow corridors, and establishes Development Criteria in addition to those contained within Floodplain and Erosion Hazard Management Ordinances. This policy adopts by reference the entire Study including floodplain maps, flow corridor maps, flood hazard data, and development criteria as described in Development Criteria for the Lee Moore Wash Basin Management Study, as adopted by the Pima County Regional Flood Control District Board of Directors on June 1, 2010 (Resolution 2010-FC6).

RP-118 S. Wilmot Road (SE) [applies to 305 23 0260 parcel only]

General Location: On the east side of S. Wilmot Road, approximately 2,400 feet south of E. Andrada Road, in Section 6, Township 17 South, Range 15 East (Ref. Co7-07-25).

Policies

-
- A. The planning and development of the subject site shall occur such that transportation, wastewater, recreational, and other major infrastructure, and the protection of riparian areas and other natural resources are integrated and coordinated.
 - B. The property shall be developed at an overall density of four residences per acre.
 - C. A mix of housing types shall be provided to insure a diverse community. Residential densities shall support multi-modal transportation opportunities including public transit even if such transit facilities are not currently in close proximity.
 - D. Lands subject to this Comprehensive Plan amendment will be surveyed for presence of the Pima pineapple cactus and its habitat. Surveys shall be conducted by an entity qualified to perform biological surveys. Surveys shall be done according to the most recent protocol approved by the U.S. Fish and Wildlife Service. A report containing the results of these surveys and copies of any data collected shall be provided to Development Services as part of any subsequent rezoning application(s). The date of the survey should not exceed one year prior to the submittal of any subsequent rezoning. If Pima Pineapple cacti are found to be present on the project site, a copy of the report shall also be sent to the Arizona Game and Fish Department's Heritage Data Management System.
 - E. To the best extent possible, the northwest and southwest quadrants of the subject property, outside of the land impacted by the Important Riparian Areas, shall be developed at a minimum density of five residences per acre to promote transit opportunities, with adequate buffers to the south, which will be determined during the rezoning/specific plan phase.
 - F. The developer will cooperate with Vail School District to formulate mutually beneficial and acceptable agreements addressing the needs of the District.
 - G. The developer shall submit a Master Traffic Impact Study that identifies existing conditions and capacity, needed construction and expansion to achieve necessary infrastructure. Phasing, implementation and the regional impacts of this development shall also be addressed. The Study shall be submitted with the Rezoning Site Analysis.
 - H. Wastewater policies:
 - 1. The owner/developer shall construe no action by Pima County as a commitment to provide sewer service to any new development within the plan amendment area until Pima County executes an agreement with the owner/developer to that effect.
 - 2. The owner/developer shall prepare a study of the sewer basin at his or her sole expense for the purposes of determining the routing and sizing of all off-site and on-site public sewer facilities necessary to provide both conveyance and treatment capacity and service to the plan amendment area and any tributary properties upstream or downstream of the rezoning area. (This requirement may be waived by the Pima County Wastewater Management Department if it determines that an acceptable study of the sewer basin has been recently completed.) The sewer basin study must be approved by the Pima County Wastewater Management Department before any rezonings may be approved within the plan amendment area.
 - 3. Upon approval of the basin study, the owner/developer shall enter into a master sewer service agreement with Pima County that specifies the improvements to be made to Pima County's public sewerage system and their timing.
 - I. The owner/developer shall fund, design and construct the necessary wastewater collection, conveyance and treatment facility improvements necessary to serve the

plan amendment area, as determined by the basin study, and in accordance with the area wide basin study that is to be prepared for the Swan Southlands project.

- J. A cultural resources survey shall be conducted for any area where one has not been done, with mitigation measures developed for any identified cultural resources, as necessary. If required, a cultural resources mitigation plan will be submitted to the Pima County Cultural Resources Office – at the time of, or prior to, the submittal of any tentative plat or site specific development plan – fulfilling the requirements prescribed by the Pima County Cultural Resources Office.

Existing Zoning

The southeast region of Tucson is clearly an area in transition. The Wilmot Road paving project, the designation of the Sonoran Corridor to the north, and the attractiveness of the Vail School District all signal this area to be an emerging development area. In addition, the City of Tucson has annexed the State Land area between Wilmot and Houghton Roads down to Andrada Road and has classified this area as a *Master Planning Area*. The Town of Sahuarita has also recently completed their *Sahuarita East Conceptual Area Plan* which projects area growth all the way to Kolb Road.

The area south of the Andrada Road alignment and north of Sahuarita Road is within unincorporated Pima County and falls into three Comprehensive Plan categories: Low Intensity Urban, Low Intensity Rural and Medium Intensity Rural. South of Sahuarita Road there is some Medium Intensity Urban as well as neighborhood and community activity centers around the Houghton Road intersection. Pima County Comprehensive Plan categories are shown on FIGURE I-A.2.c.

The land south of the property, between the site and Sahuarita Road and north of the site between the property and Andrada Road consists of unsubdivided, large lot, unregulated lot-split neighborhoods. East of the site the property is undeveloped and vacant and owned by the United States Bureau of Land Management. The property to the west of Wilmot Road is also undeveloped and vacant and is owned by the Arizona State Land Trust (ASLD).

Zoning in the area is generally Rural Homestead (RH) both within the City of Tucson and unincorporated Pima County areas. Nearby properties in unincorporated Pima County lying north of Sahuarita Road are zoned Rural Homestead (RH) and Rural Residential (GR-1). Properties in the area of Sahuarita and Houghton Roads are zoned General Business (CB-2), Single Family Residential (CR-3), and Transitional (TR).

Existing land use in the area is shown in *Table 2: EXISTING ZONING AND LAND USE* and on FIGURE I-A.4b/c.

Table 2: EXISTING ZONING AND LAND USE

Parcel Number	Pima Prospers	Current Zoning	Land Use	Ownership	Density (approx.)	Building Height
1	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet
2	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet
3	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet
4	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet
5	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet
6	LIU 3.0	RH	Vacant	Private		
7	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet
8	LIU 3.0	RH	Residential	Private	.25 RAC	15 to 30 feet

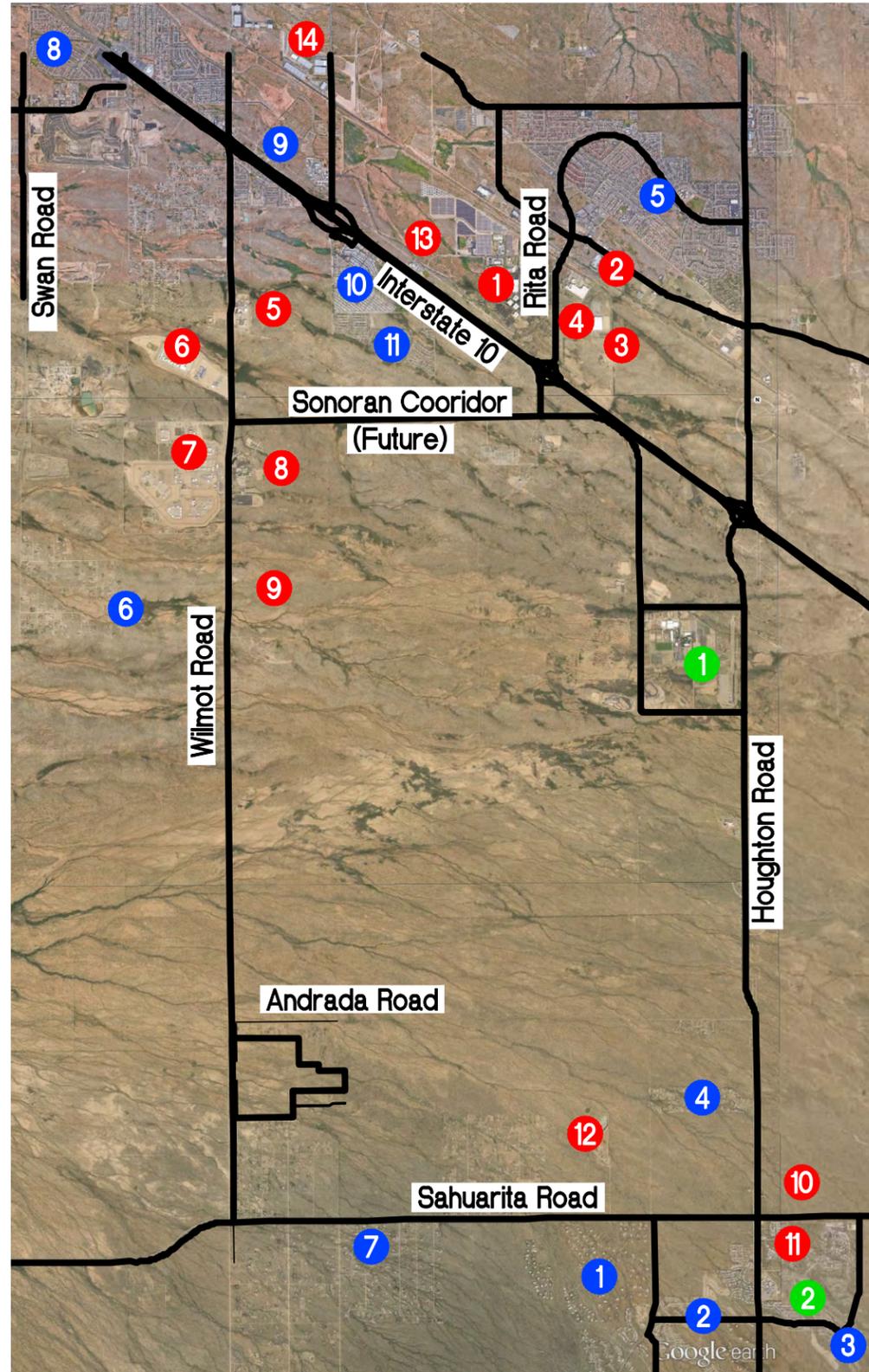


FIGURE I-A.1 LOCATION AND REGIONAL CONTEXT

Legend

Services & Employment Centers

1. U of A Science and Technology Center
2. Arizona Canning/La Costena
3. Target Fulfillment Center
4. Interstate Commerce Park
5. Federal Corrections Facility
6. U.S. Penitentiary
7. Arizona State Prison
8. City of Tucson Public Safety Academy
9. City of Tucson Fire Station #6
10. American Legion Post #109
11. Corona de Tucson Commercial area and Corona de Tucson Fire Station 181
12. Corona de Tucson Wastewater Treatment Facility
13. U of A Science & Technology Park
14. Century Park

Residential Development

1. Sycamore Canyon/Springs
2. New Tucson
3. Santa Rita
4. Corona de Tucson Unit #14
5. Rita Ranch
6. Verano (proposed)
7. Sycamore Canyon Estates
8. Rancho Valencia
9. La Estancia
10. Voyager Resort
11. Sycamore Park

Recreation Areas

1. Pima County Fairgrounds, Shooting Range and Tucson Raceway Track
2. The Challenge at Santa Rita Golf Course and Tin Can Lounge



not to scale

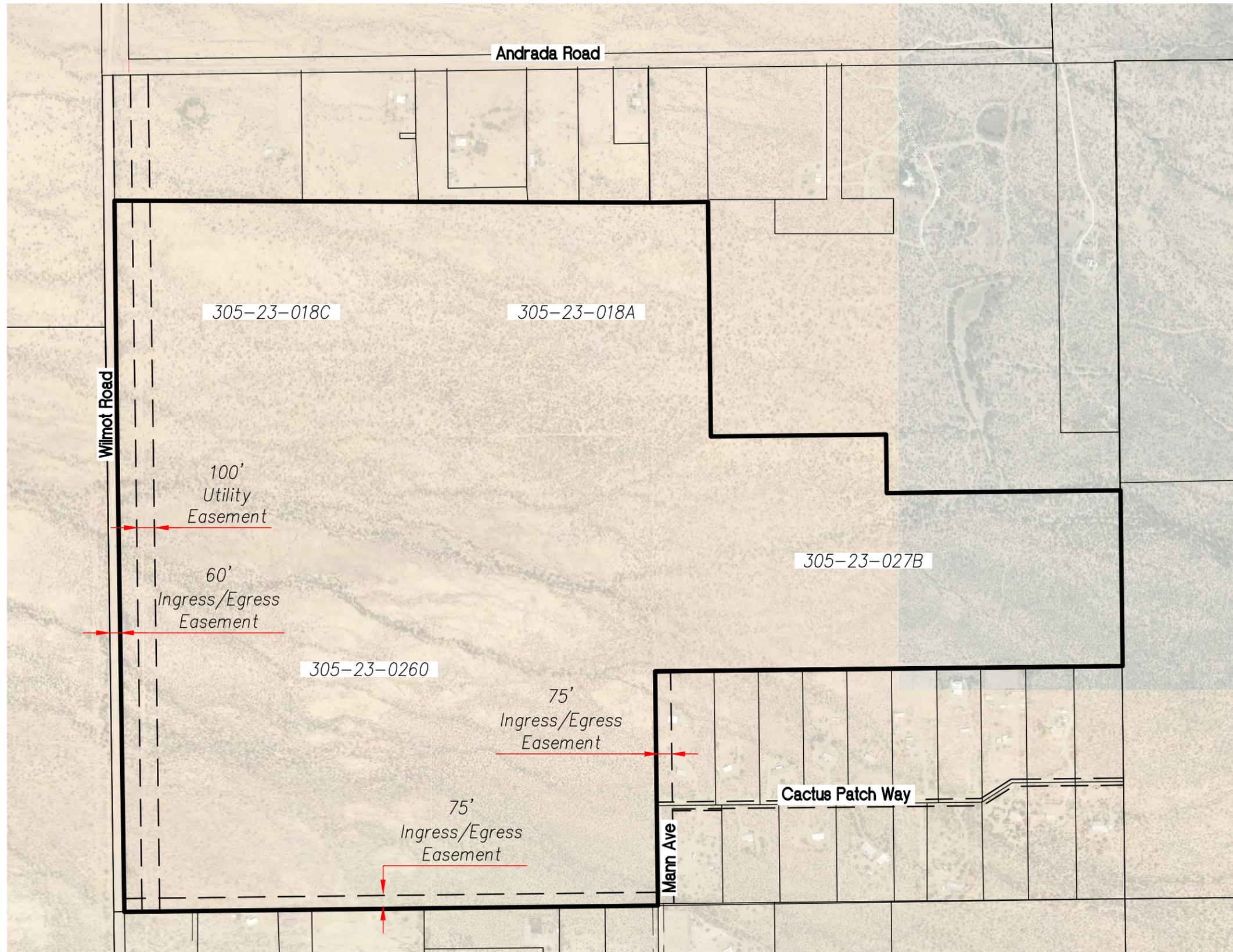
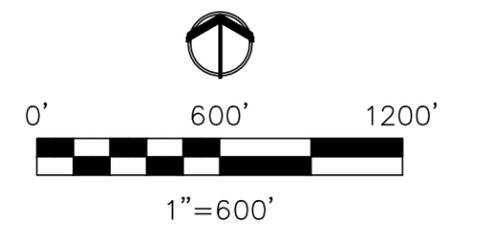


FIGURE I-A.2a/b
EXISTING
LAND USES/EASEMENTS



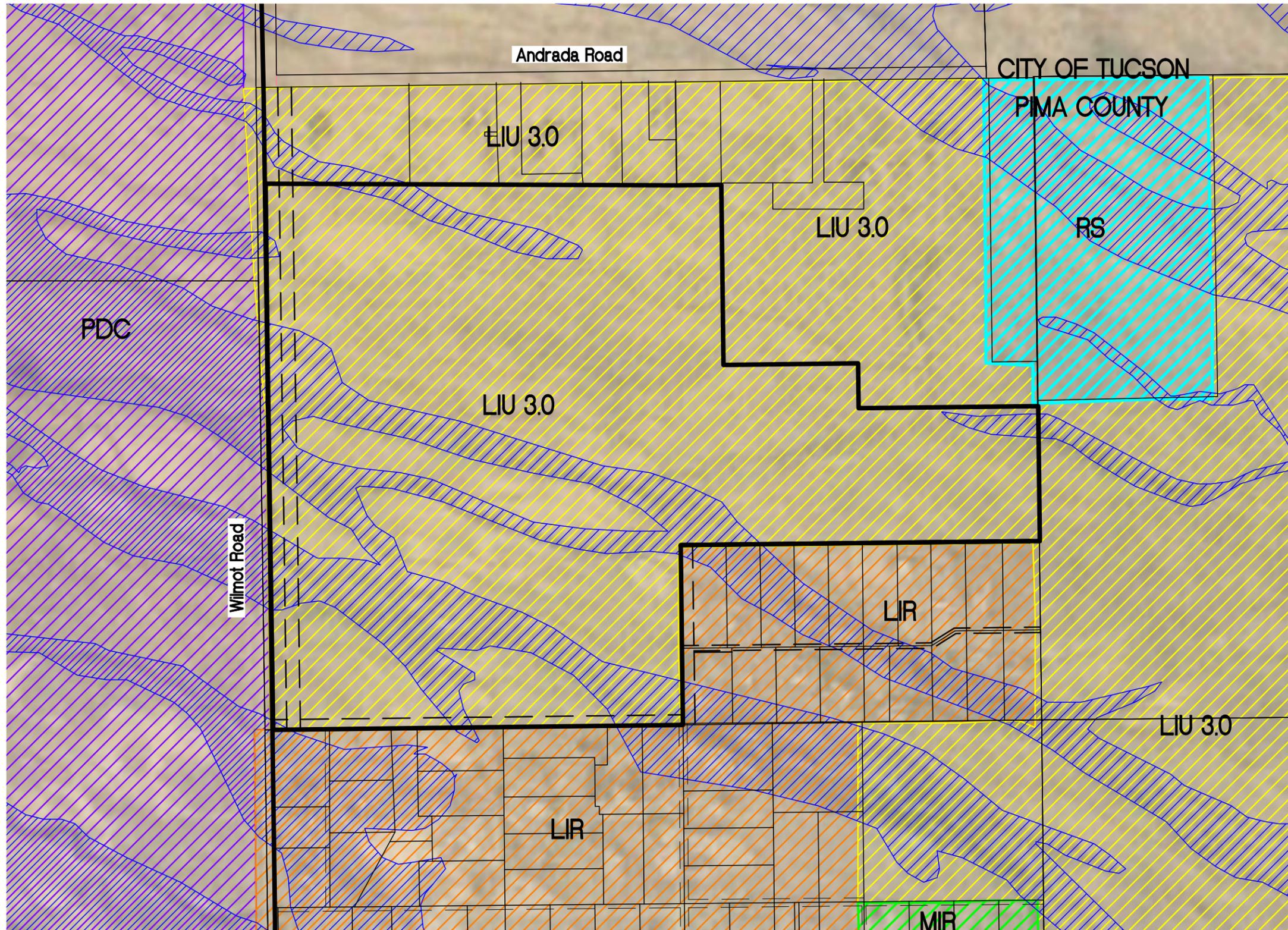


FIGURE I-A.2c COMPREHENSIVE PLAN

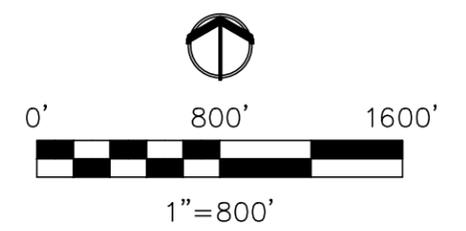
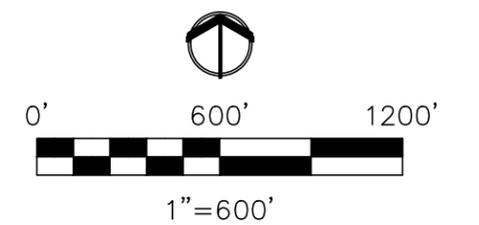
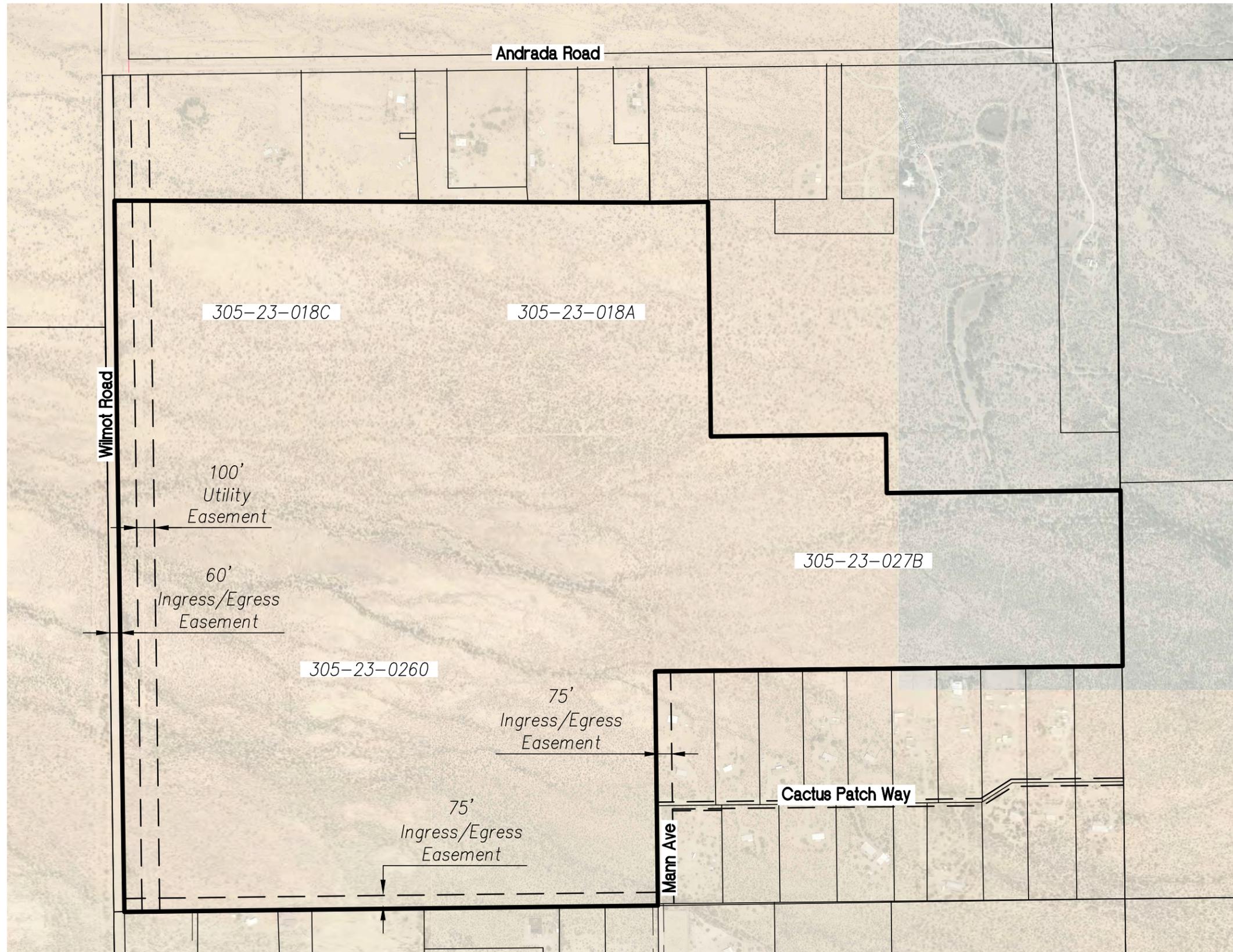


FIGURE I-A.3 AERIAL PHOTO



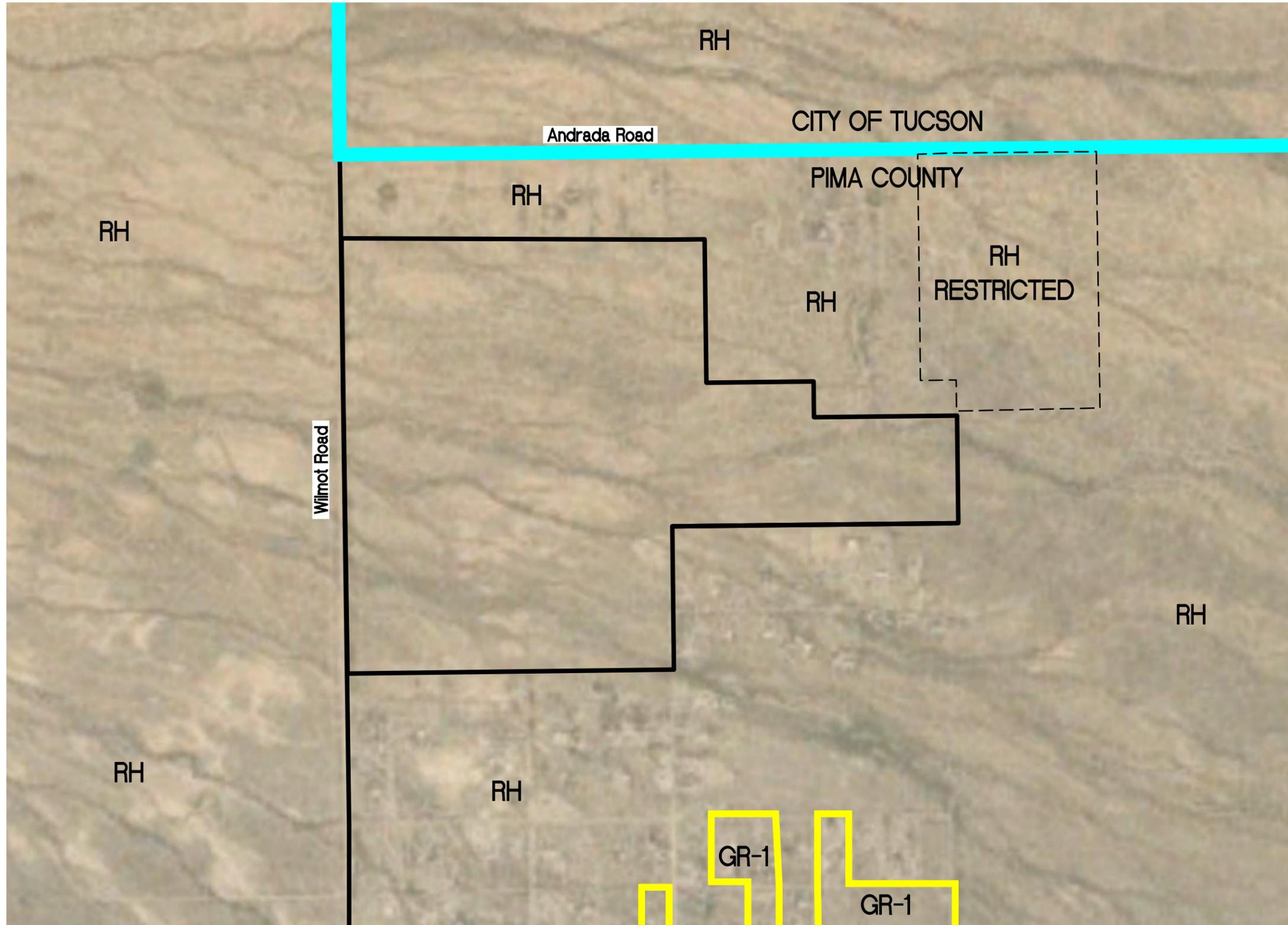
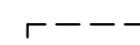
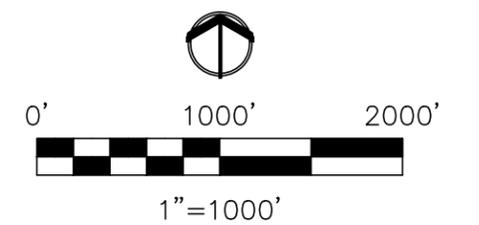


FIGURE I-A.4a SURROUNDING ZONING

ZONING LEGEND

-  RH (PIMA COUNTY)
-  RH (CITY OF TUCSON)
-  GR-1
-  RH RESTRICTED



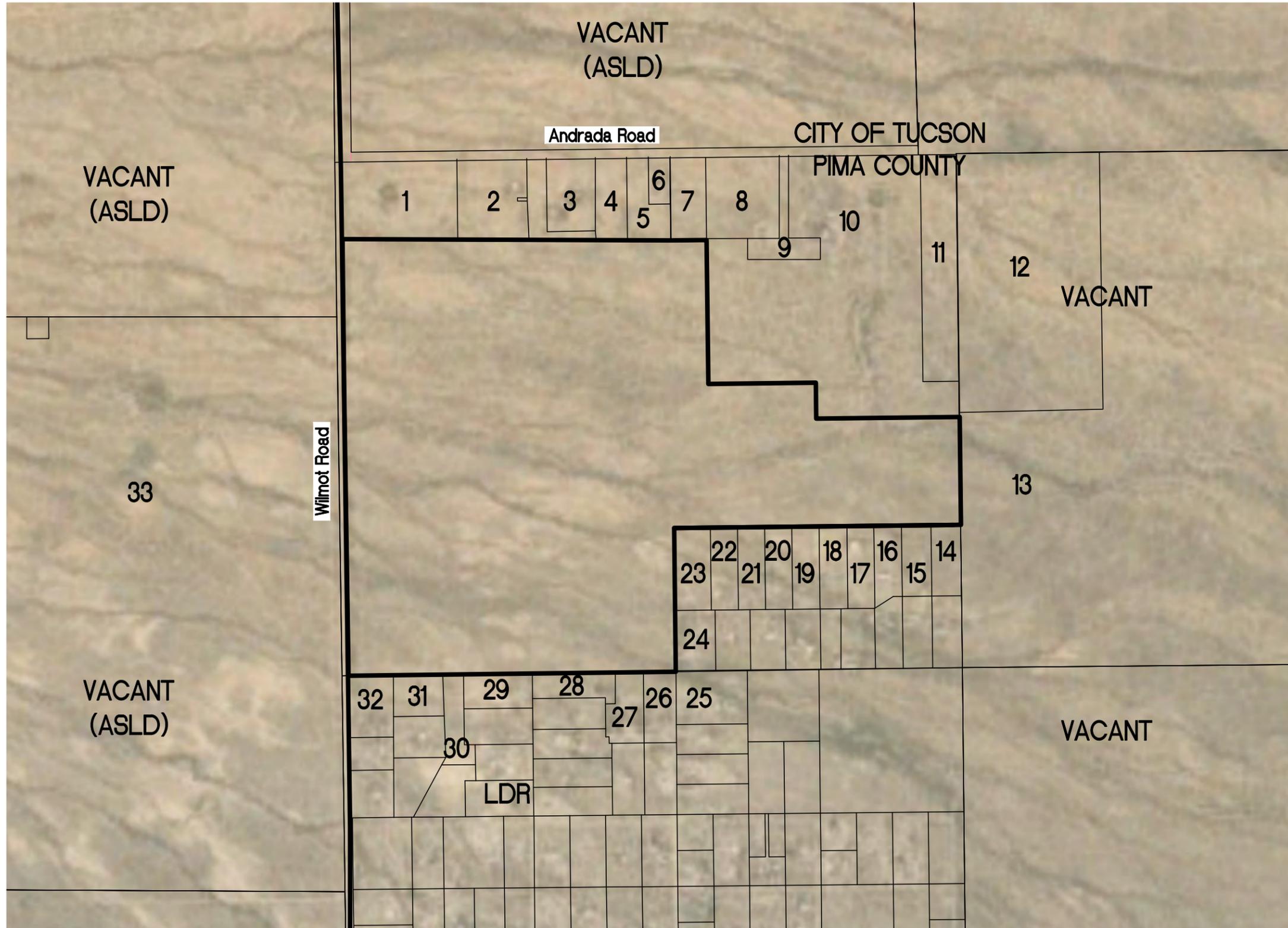
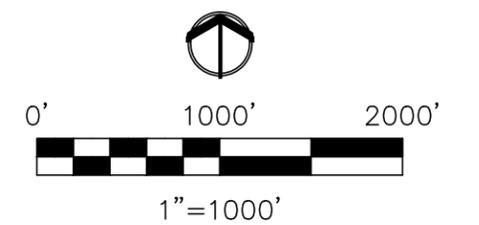


FIGURE I-A.4b/c

SURROUNDING
LAND USE

NOTE:

All homes are single story



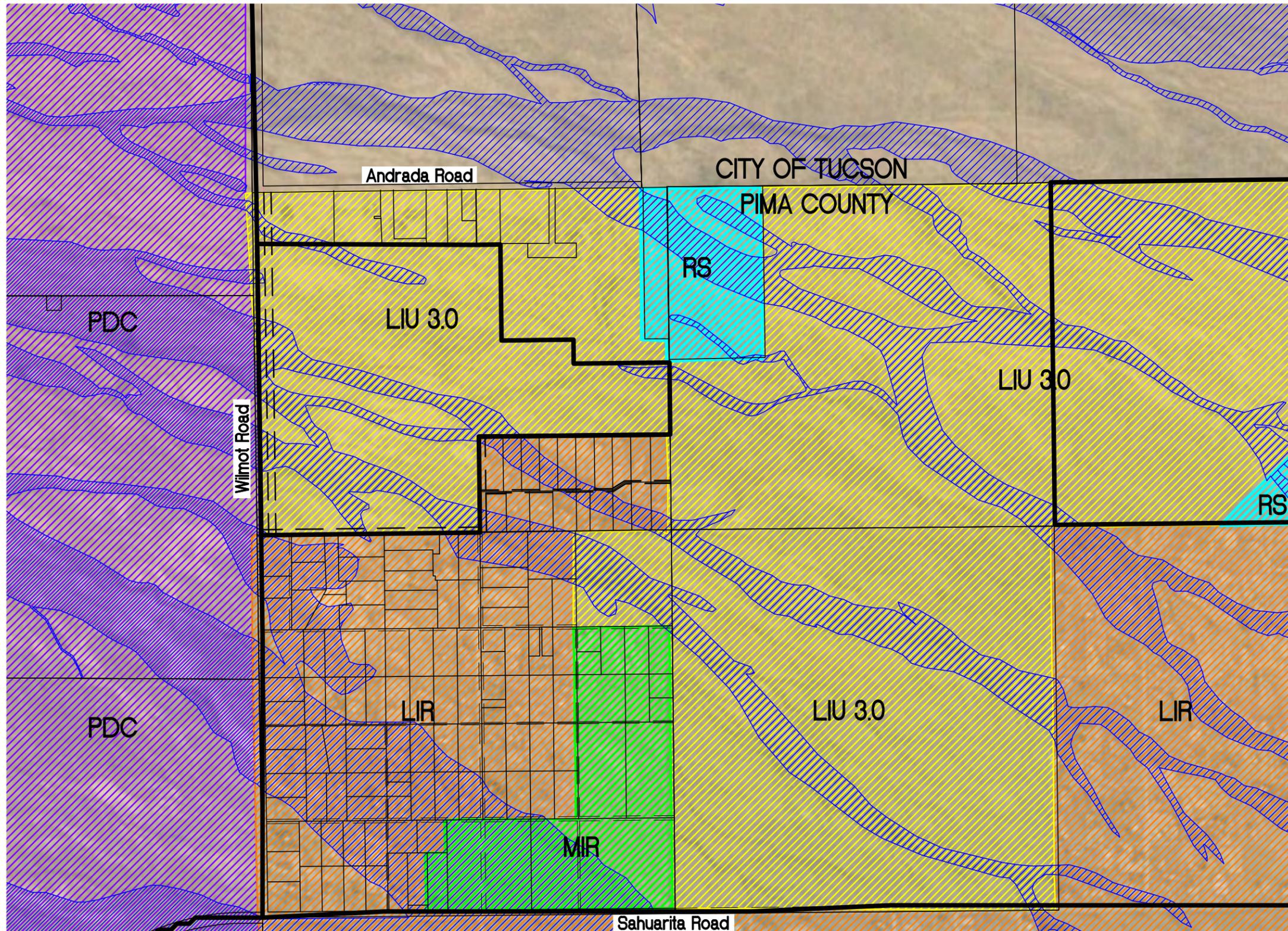
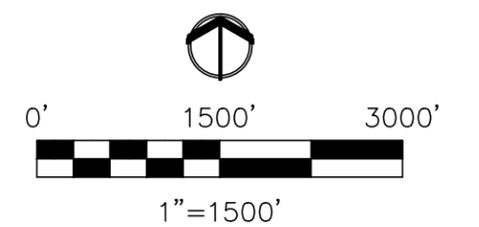


FIGURE I-A.4e

SURROUNDING
COMPREHENSIVE PLAN



I-B. TOPOGRAPHY AND GRADING

Topographic Characteristics

Analysis of existing area topography indicates that the area has relatively flat terrain, sloping from southeast to northwest at approximately one to one and a half percent. Total elevation variation is approximately 75 feet from the southeasternmost point to the northwest corner at Wilmot Road.

A review of the site topography shows that the site does not contain any:

- Restricted peaks and ridges;
- Rock outcrops or talus slopes;
- Slopes exceeding 15%;
- Any other significant topographic features; or
- Significant grading which has previously occurred on this property.

Average Cross Slope Calculation

The Average Cross Slope is calculated as:

$$\text{Average Cross Slope} = \frac{C \times L \times 0.0023}{A}$$

$$= 6.57 \%$$

where: C (Contour Interval) = 1 foot
 L (length) = 1,028,100 feet
 A (parcel area) = 360 acres

The analysis of the average cross slope shows that the property does not fall under the regulations of Pima County’s Hillside Development Zone.

Soils Characteristics

Soils in this area are predominately Bucklebar-Sahuarita complex, which is a deep, well-drained soil. The surface tends to be sandy loam with subsoil being sandy clay loam down to 60 inches or more. The characteristics of the other soils in the area are very similar to the Bucklebar-Sahuarita complex.

The soil types on this property are moderately well suited to home site development. Primary concerns are potential for wind erosion and moderate shrink-swell potential. Revegetation will alleviate concerns of wind erosion and potential for shrinking/swelling can be alleviated by using proper engineering designs.

Table 3: SOIL DATA

	Natural drainage class	Runoff class	Percent of Area
Bucklebar-Sahuarita Complex	Well drained	Low	46.6
Tubac Gravelly Loam	Well drained	Medium	29.3
Yaqui Fine Sandy Loam	Well drained	Low	15.3
Arizo-Riverwash Complex	Excessively drained	Very low	4.7
Hatz Loam	Well drained	Medium	4.1

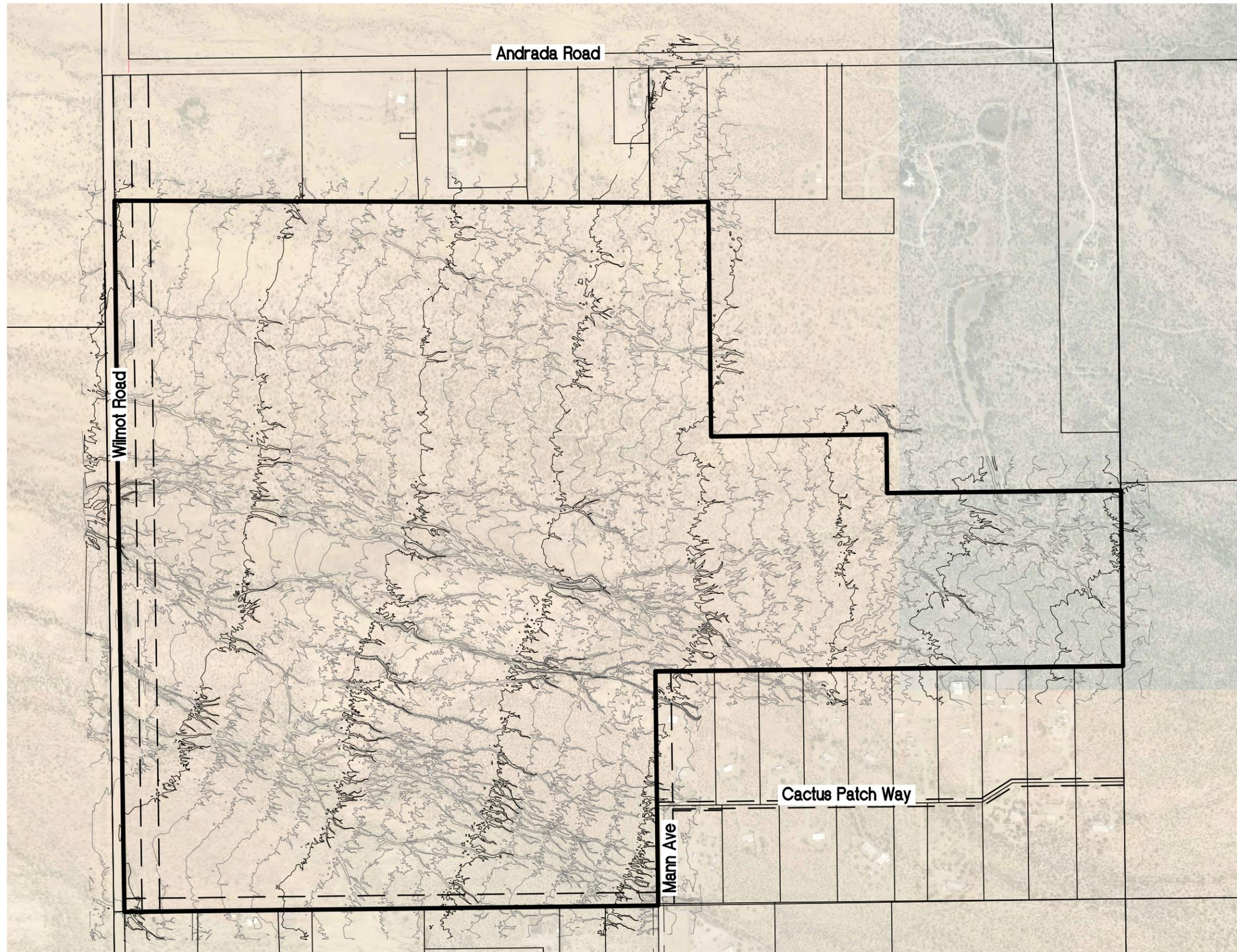
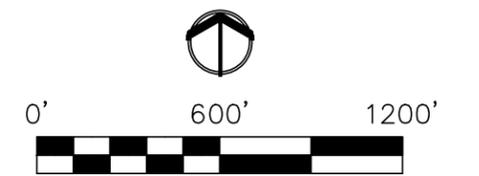


FIGURE I-B.1

TOPOGRAPHIC CHARACTERISTICS

AVERAGE CROSS SLOPE	OVERALL
Area (s.f.)	15684499.70
Area (acres)	360.07
Length of contours	1028100
Contour Interval	1
Average Cross Slope (%)	6.57



I-C. HYDROLOGY

This area of southeastern Tucson has been studied in great detail as a part of the *Lee Moore Wash Basin Management Study*, which was completed in 2008. This study delineated all off-site watersheds, determined flow volumes, performed 100 year floodplain analyses, established designated flow corridors, accounted for any upstream man-made or natural features and developed the *Development Criteria for the Lee Moore Wash Basin Management Plan* (Revised December 2009). This document sets out the criteria for future growth within the area.

Off-Site Characteristics and Downstream Issues

Off-site drainage will have a large impact to this development as the property is in an area which is predominantly distributary channel networks comprised of numerous, ill-defined channels and alluvia fans. Flow corridors within this area are to be established and set aside to allow the discharge to flow through the property. Due to the complexity of the drainage patterns, the results of the Lee Moore Wash Basin Management Study were used as the basis for runoff discharges in this site analysis.

The subject property and offsite watersheds are located within the Fagan Wash Watershed, which produces two concentration points along the east property boundary. The downstream (western) edge of the property is Wilmot Road and results in three concentration points. The area west of Wilmot is undeveloped and is owned by the Arizona State Land Trust. The property is primarily natural desert vegetation. Offsite Watersheds are depicted on FIGURE I-C.1

Discharges below are taken from the Lee Moore Wash Basin Management Study. Inflow and outflow runoff values of the property, under existing, undeveloped conditions are included in the following table.

Table 4: EXISTING CONDITIONS RUNOFF

Concentration Point	Existing Q100 (c.f.s.)	
	Property Inflow	Property Outflow
Southeast	2290	
East	350	
Northeast	310	
Southwest		1170
Middle-West		1320
Northwest		130

Pima County had the Lee Moore Wash Study prepared to create a comprehensive floodplain management tool for this area. The study established 100-year floodplains and flow depths. This information for the property has been included in FIGURES I-C.4a and I-C.4b.

On-Site Characteristics

The property within the zoning request is currently undeveloped and covered with typical desert vegetation.

The Lee Moore Wash Study conceptually delineated flow corridors within each basin. These corridors were selected to serve both as riparian corridors and to be the primary

analysis, onsite flows have been further analyzed with updated and more detailed topographic mapping and the resulting flow corridors are depicted on FIGURE I-C.4c. The corridors are intended to be left predominately in their natural state.

There is an erosion hazard setback of 25 – 50 feet (per County Ordinance 16.28.020) depending on the discharge of each flow corridor.

There are no FEMA-designated flood hazard areas or floodways within the subject property, per the current Flood Insurance Rate Maps (FIRM) consequently the Wilmot Park property will not require Federal Flood Insurance.

All homes will be elevated a minimum of one foot from the adjacent flow corridor water surface elevation. Any encroachments into the riparian and flow corridors will comply with local floodplain ordinances. Specifically, no increases in the floodplain elevation greater than 0.1 feet will be permitted at the property boundaries nor will velocity increases exceed 10%. In addition, any fill will be protected from erosion through the use of measures such as riprap.

The downstream property is undeveloped and owned by the State of Arizona. Paving of Wilmot Road is imminent and the paving will maintain the existing grades within the current unpaved roadway. Consequently, the downstream conditions will not remain for the foreseeable future as they are today and the runoff leaving this property will not negatively impact the downstream conditions.

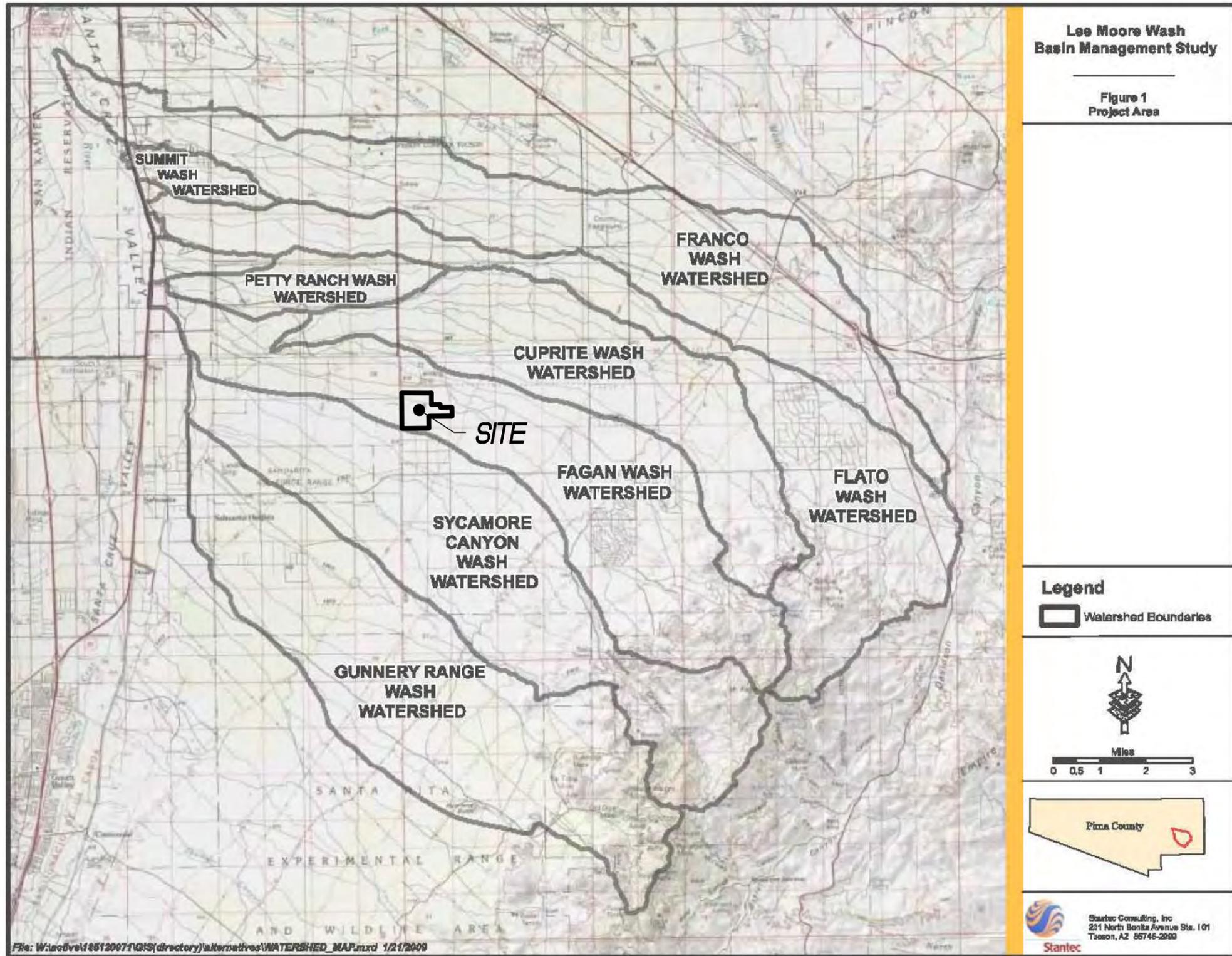


FIGURE I-C.1 OFFSITE WATERSHEDS

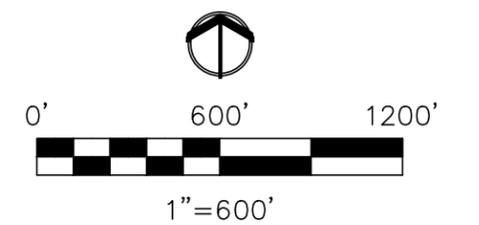
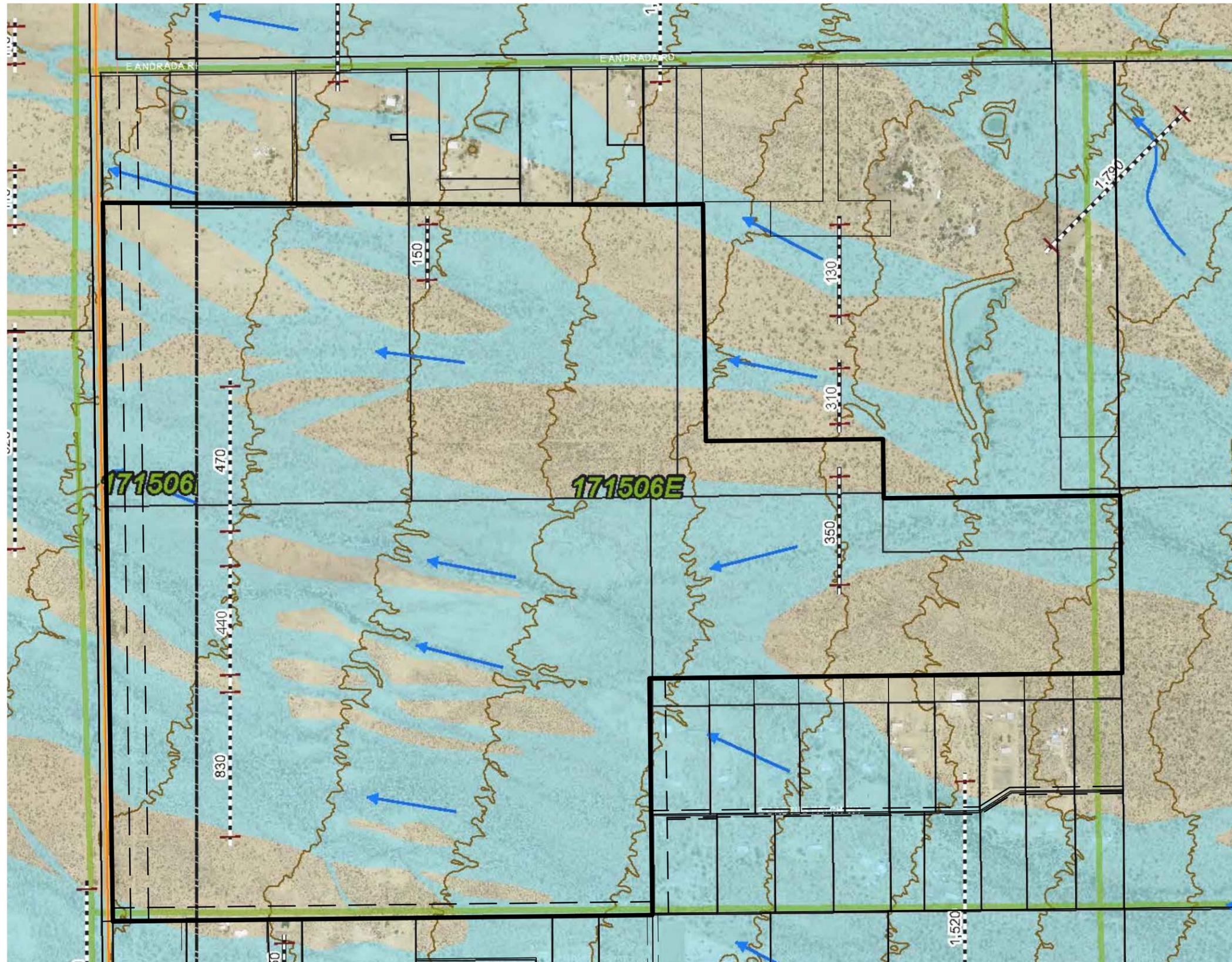
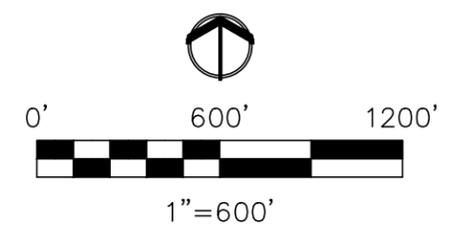


FIGURE I-C.4a LEE MOORE WASH
100-YEAR FLOODPLAINS



LEGEND

- Unmodeled Breakout Potential
- Flow arrow
- Sheet line
- Streets (major)
- 10-ft Contours (NAVD 88)
- FLO-2D Flow Recording Cross Sections (discharge in c
- CLS Designation Boundary
- Concentration Point (HEC-HMS model)
- 100-yr FLD-2D Flood Limits ($Q_p > 100$ cfs)
- 100-yr HEC-RAS Flood Limits ($Q_p > \pm 1000$ cfs)
- Section Line
- Parcels (approximate)



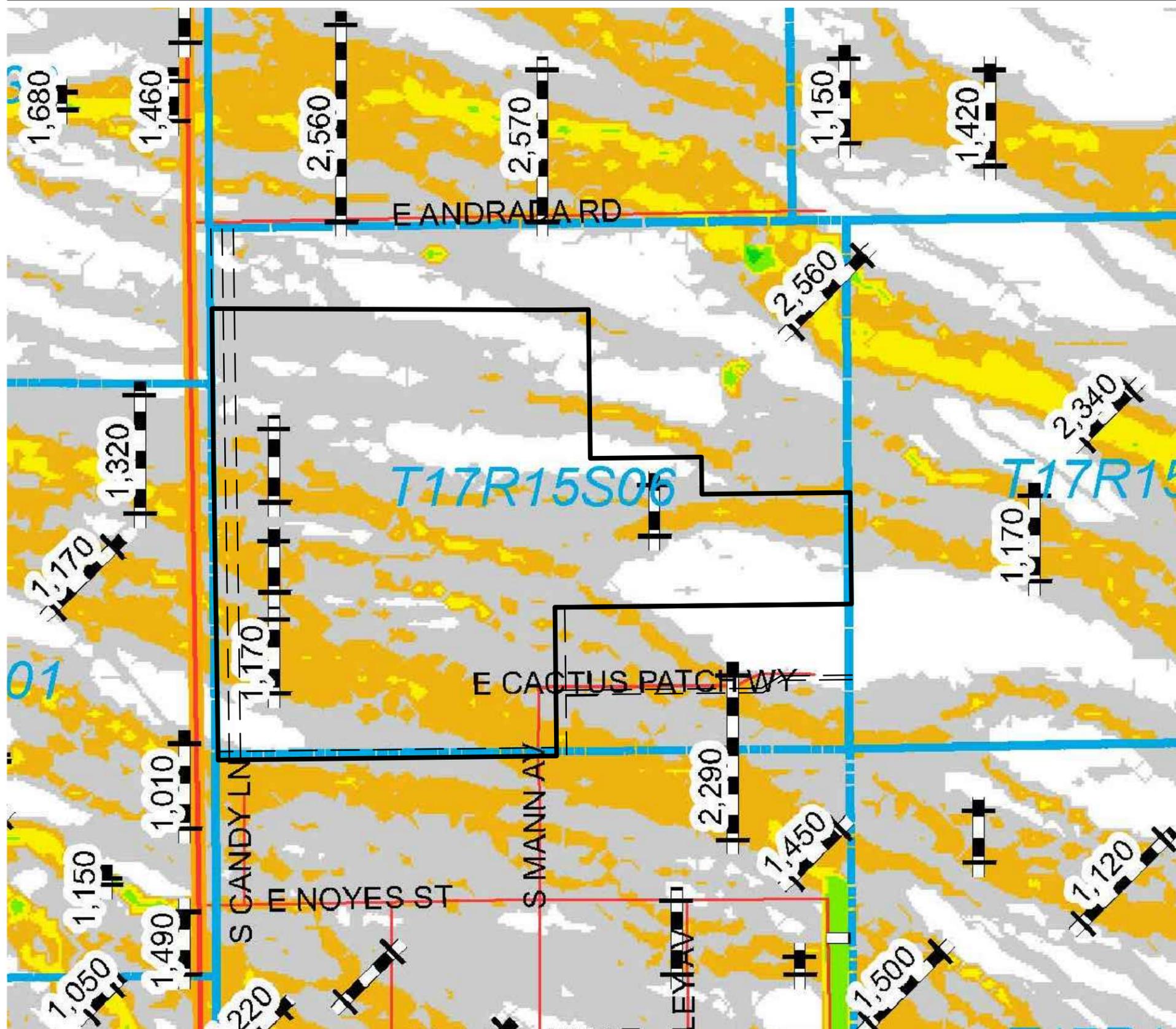
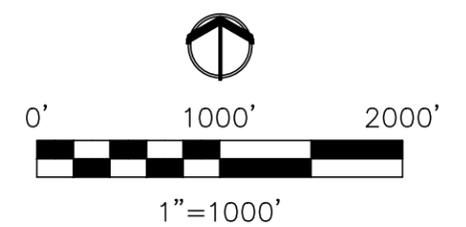
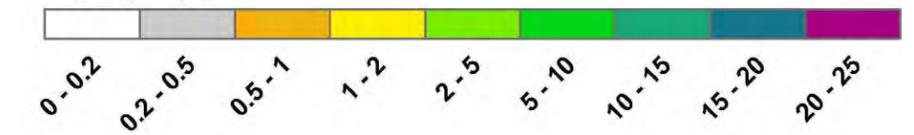


FIGURE I-C.4b LEE MOORE WASH
100-YEAR FLOOD DEPTHS

LEGEND

-  Flow Recording Cross Sections (Q-100>500 cfs)
-  Streets (major)
-  Streets (all)
-  100-ft Resolution FLO-2D Model Boundary

Flow depth (ft)



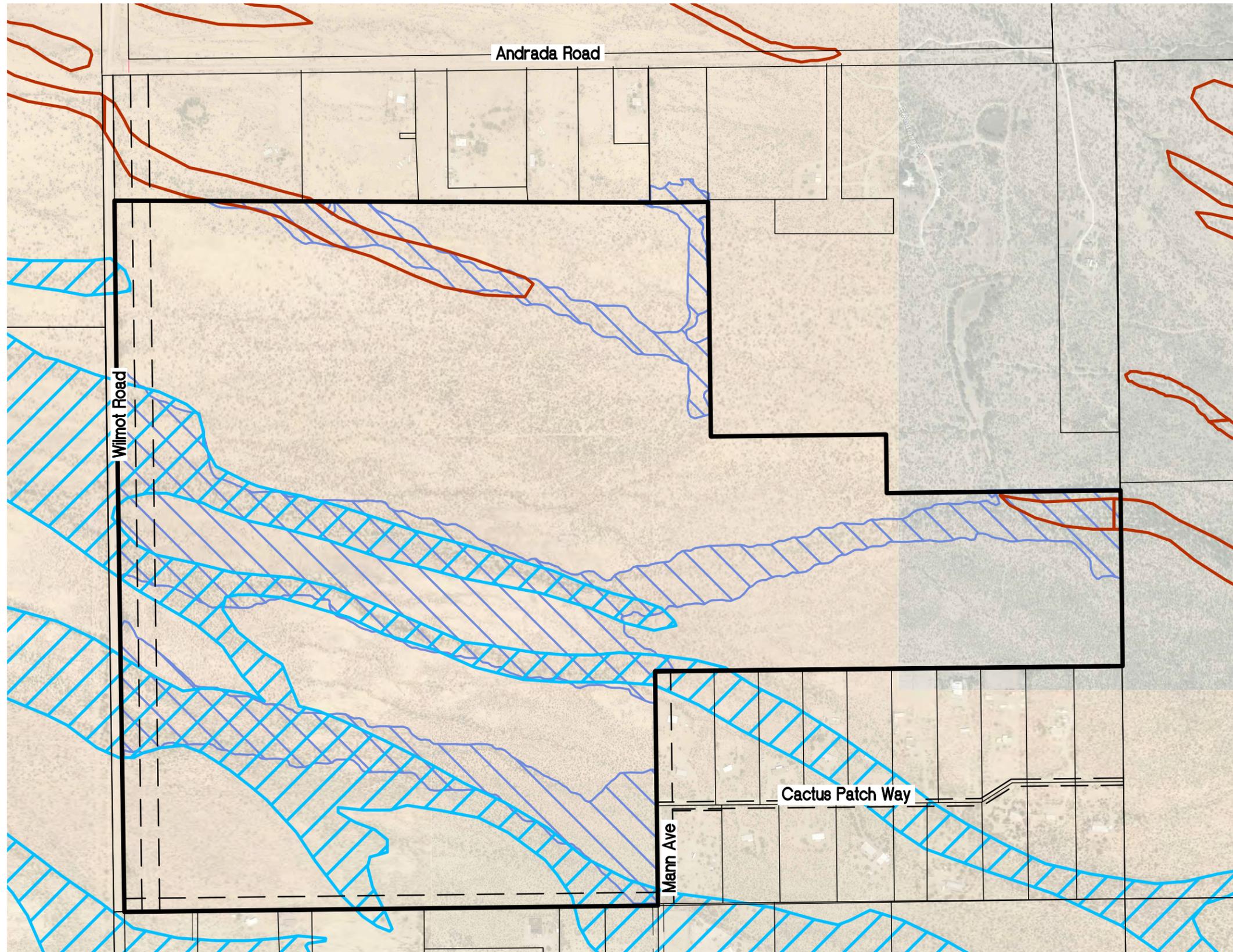
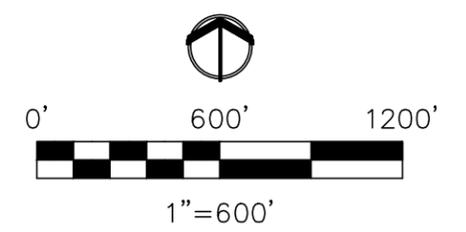


FIGURE I-C.4c

LEE MOORE WASH
FLOW CORRIDORS

LEGEND

-  100-year Floodplain
-  Important Riparian Areas
-  Xeroriparian Areas



I-D. BIOLOGICAL RESOURCES

Conservation Land Systems

The parcels involved in this rezoning fall entirely outside either the Biological Reserve or the Multiple Use Management Area as defined in the Pima County Conservation Lands System (CLS). There are no Special Species Management Areas or Scientific Research Areas identified on this site. There are no Critical Landscape Connections identified on or near this property. There are three wash threads on the property which are all part of the braided Lee Moore Wash system which are classified as Important Riparian Areas. These are shown on FIGURE I-D.1.

Priority Conservation Area

The entire site (as well as the surrounding region) lies within the Priority Conservation Area (PCA) for the Pima Pineapple Cactus and the PCA #2 for the Lesser Long-Nosed Bat. There are no other Priority Conservation areas associated with or near this property. The property does not fall within a PCA for the needle-spined pineapple cactus, the cactus ferruginous pygmy-owl or the western burrowing owl.

Pima County has mapped several riparian areas on the property. The northernmost mapped area is Xeroriparian D. The other three areas have been classified as Important Riparian Areas. These areas are depicted on FIGURE I-D.10

Community Open Space

The property is not designated as either a Habitat Protection or Community Open Space priority acquisition property.

Arizona Game & Fish Department Special Status Species

The property has been analyzed with the Arizona Game and Fish Department Heritage Data Management System (HDMS). The results show the special status species identified on Table 5 below. Four species have been documented to occur within a three mile radius of the project vicinity.

Table 5: ARIZONA GAME & FISH DEPARTMENT SPECIAL STATUS SPECIES

Name	Common Name	Agency				
		FWS	USFS	BLM	NPL	SGCN
Coryphantha scheeri var. robustispina	Pima Pineapple Cactus	LE			HS	
Echinocereus fasciculatus	Magenta-flower Hedgehog-cactus				SR	
Tumamoca macdougallii	Tumamoc Globeberry		S	S	SR	
Gastrophryne olivacea	Western Narrow-mouthed Toad			S		1C

Source: Arizona Game and Fish Department, Heritage Data Management System, 2014

Status Definitions:

S - Sensitive	HS - Highly Safeguarded, no collection allowed
SR - Salvage Restricted	
LE - Listed Endangered	1c - Unknown Status Species

Vegetative Surveys

A plant survey has been completed on the property in the last several years. The entire property was surveyed in two separate studies, one in August 2013 and the other in July 2015. Both studies were prepared by GRS Landscape Architects. Results of these surveys are presented below. A complete copy of each study is included in APPENDIX A.

Pima Pineapple Cactus (PPC)

As a result of the two studies, three Pima Pineapple Cactus (*Coryphantha scheeri* var. *robustispina*) were found. While US Fish and Wildlife protocol was not followed, the search was done by two people, each walking transects, generally east-west across the site with more concentrated searches in areas where plant specimens were likely to be found.

Of the three plants that were found, the siting on the east side of the property was actually the remnants of a dead PPC. It was not attached to the ground and likely was dislodged by an animal or flooding. The two found in the northwest corner of the site are in good condition and quite large. The locations of these cacti are shown on FIGURE I-D.3

Saguaro Cactus

A site inventory for saguaro cactus (*Carnegie gigantean*) was performed in conjunction with the Pima Pineapple cactus survey. The saguaro locations have been recorded and are shown on FIGURE I-D.7

The saguaro population density is consistent with the area. Cattle grazing has likely had an impact on the population by degrading the understory plantings.

The saguaros are not a dominant element on the site and the population will likely continue to decline while grazing is present on the property.

Ironwood Trees

Ironwood Trees are not found in this area.

Vegetative Communities and Associations

Overview

The vegetation on the site has been impacted by long term grazing on the property. This has resulted in the prominent understory vegetation being Cholla, both *Opuntia fulgida* and *Opuntia bigelovii*. Mesquites have been impacted as well and tend not to reach mature heights.

In general, the drainage crosses the site from southeast to northwest. In general, the property has braided stream flows where flows combine and then break away and recombine. This has caused a general decline in much of the riparian habitat on the site. This is caused by continually shifting riparian areas, which prevent long term riparian area vegetative growth.

Pima County has identified two vegetative zones on the site and these have been mapped on FIGURE I-D.10.

I – Riparian Vegetation

This vegetation typically occurs as a linear corridor along washes and floodplains. As indicated above, the riparian habitat is in generally poor condition. This is in part due to the braided drainage patterns, which can orphan the existing riparian vegetation. It is also due to the effects of grazing. The riparian areas are characteristic of the Sonoran Desertscrub Xeroriparian biome and consist primarily of mesquite. Other plant species occurring in this community are:

- Blue Palo Verde (*Parkinsonia florida*)
- Catclaw Acacia (*Senegalia greggii*)
- Seep Willow (*Baccharis salicifolia*)
- Tree Tobacco (*Nicotiana glauca*)
- Desert Broom (*Baccharis sarothrae*)
- Desert Hackberry (*Celtis pallida*)

II - Upland Habitat

The upland habitat is generally a Sonoran Desertscrub biome that has been significantly altered by cattle grazing. These areas contain the most diversity of species but still show impact to the ground plane caused by grazing. Grasses and forbs are limited on the site, with many areas completely void of grass. The most common vegetative material in this area consists of:

- Velvet Mesquite (*Prosopis velutina*)
- Foothill Palo Verde (*Cercidium microphylla*)
- Saguaro (*Carnegiea gigantea*)
- Cholla (*Opuntia spinosior*, *O. fulgida*, *O. leptocaulis*, *O. arbuscula*)
- Prickly Pear Cactus (*O. engelmannii*, *O. phaeacantha*)
- Barrel Cactus (*Ferocactus wislizenii*),
- Pinkflower Hedgehog Cactus (*Echinocereus fendleri*)
- Creosote Bush (*Larrea tridentata*)
- Triangle-Leaf Bursage (*Ambrosia deltoidea*)
- Burroweed (*Isocoma tenuisecta*)
- Desert Zinnia (*Zinnia acerosa*)
- Pima Pineapple Cactus (*Coryphantha scheeri* var. *robustispina*)
- Three-awn grass (*Aristida* spp.)
- Lehman's lovegrass (*Eragrostis lehmanniana*)
- Grama grass (*Bouteloua* sp.)

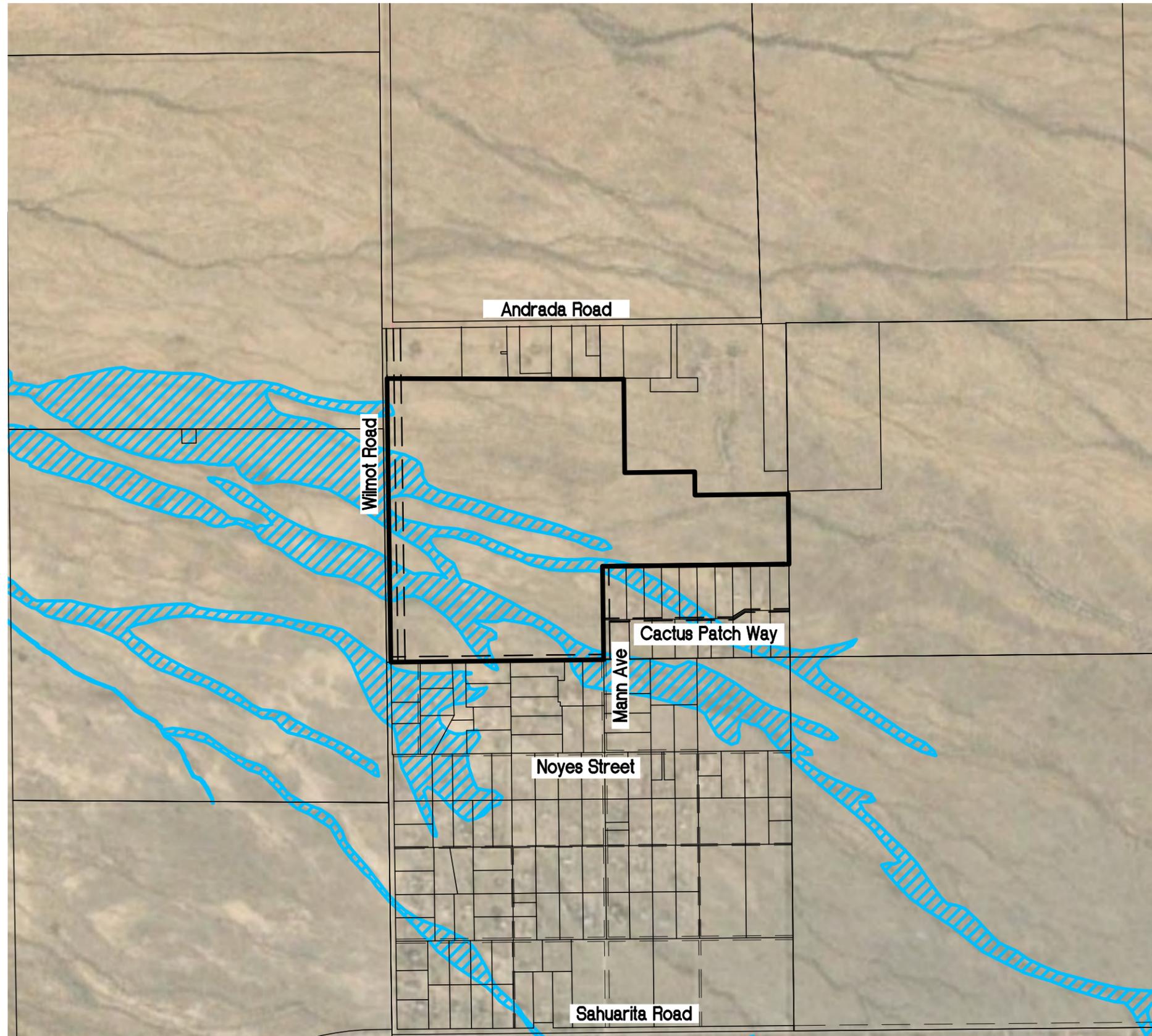
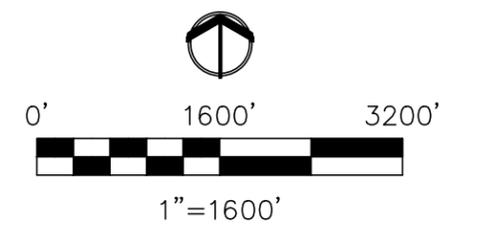


FIGURE I-D.1 CONSERVATION LANDS SYSTEM (CLS)

CLS CATEGORY

 Important Riparian Areas



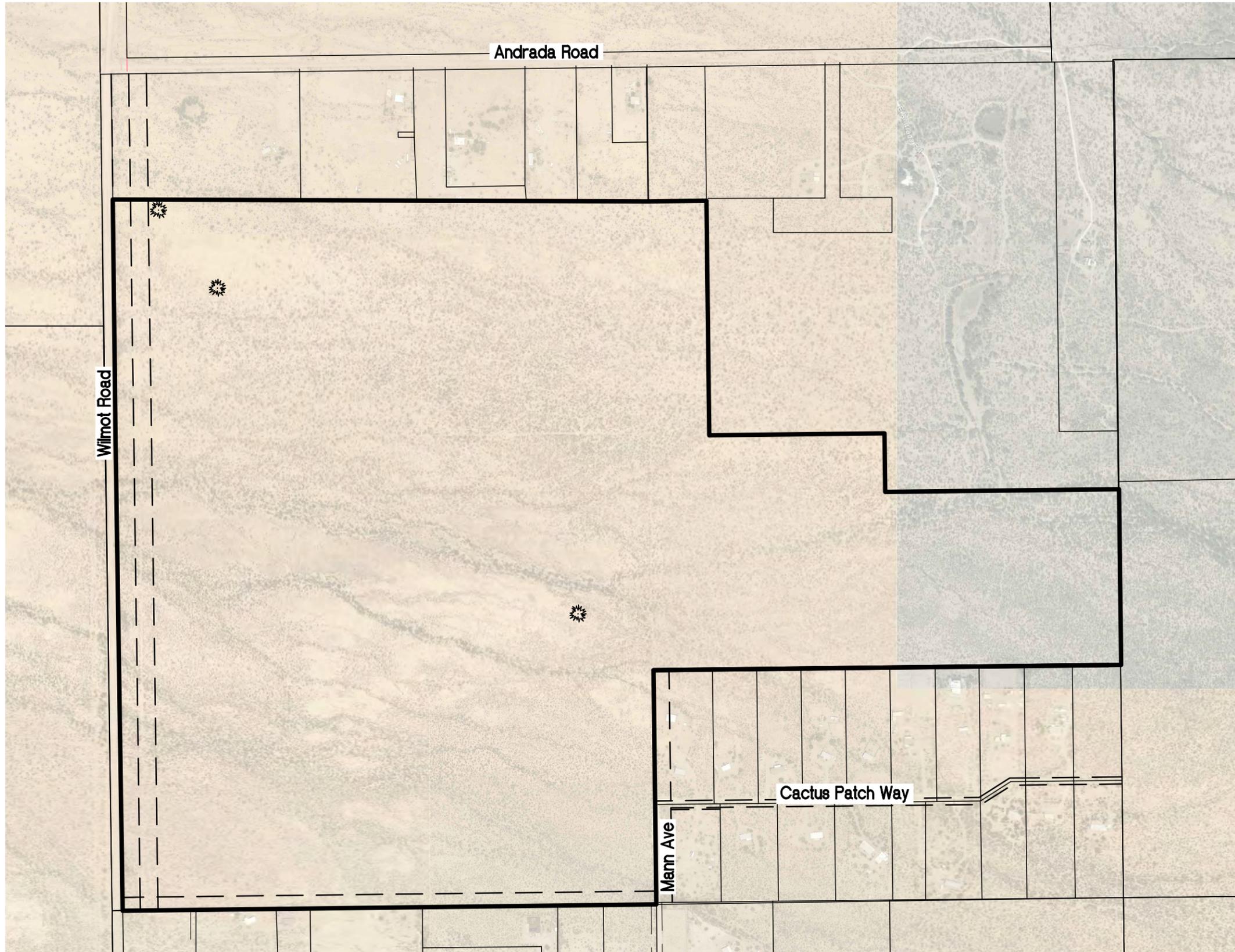


FIGURE I-D.3

PIMA PINEAPPLE CACTUS INVENTORY

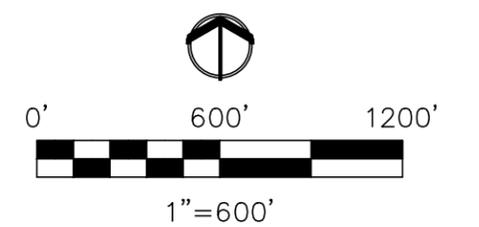
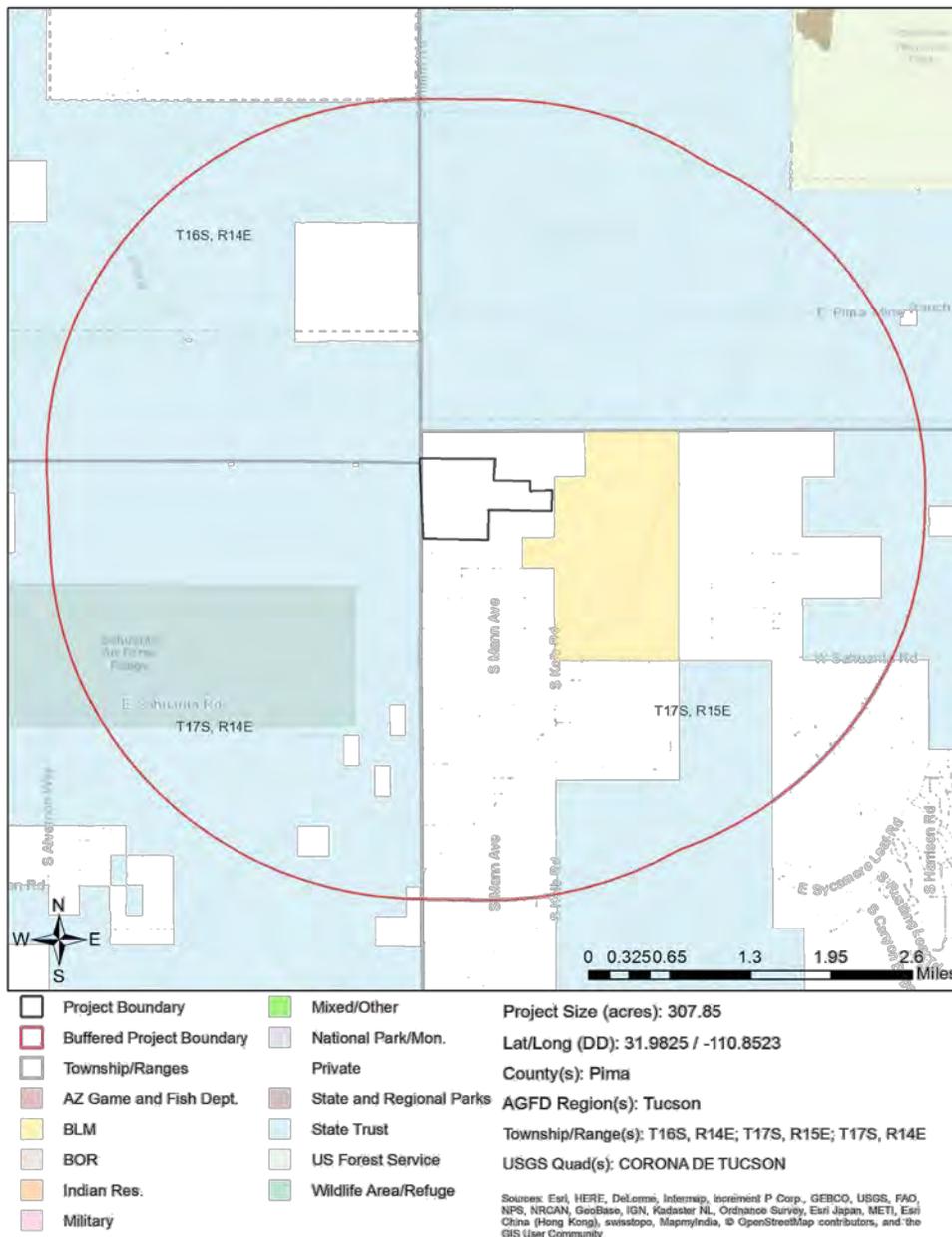


FIGURE I-D.6 SPECIAL STATUS SPECIES

Topo Basemap With Township/Ranges and Land Ownership



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

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
Coryphantha scheeri var. robustispina	Pima Pineapple Cactus	LE			HS	
Echinocereus fasciculatus	Magenta-flower Hedgehog-cactus				SR	
Gastrophryne olivacea	Western Narrow-mouthed Toad			S		1C
Tumamoca maddougallii	Tumamoc Globeberry	S		S	SR	

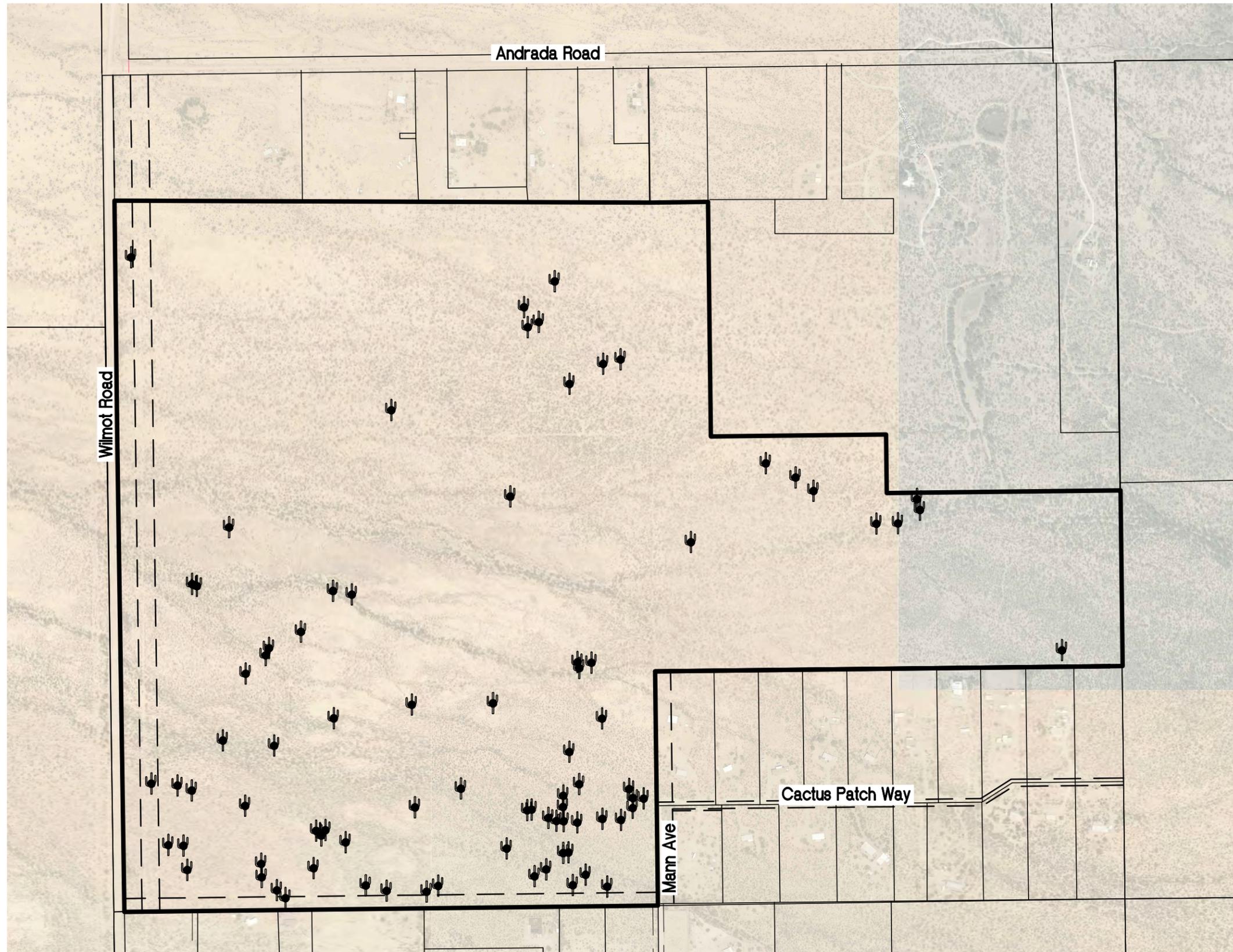
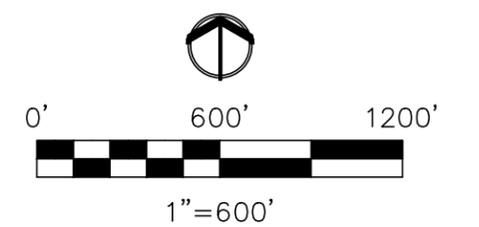


FIGURE I-D.7 SAGUARO CACTUS INVENTORY



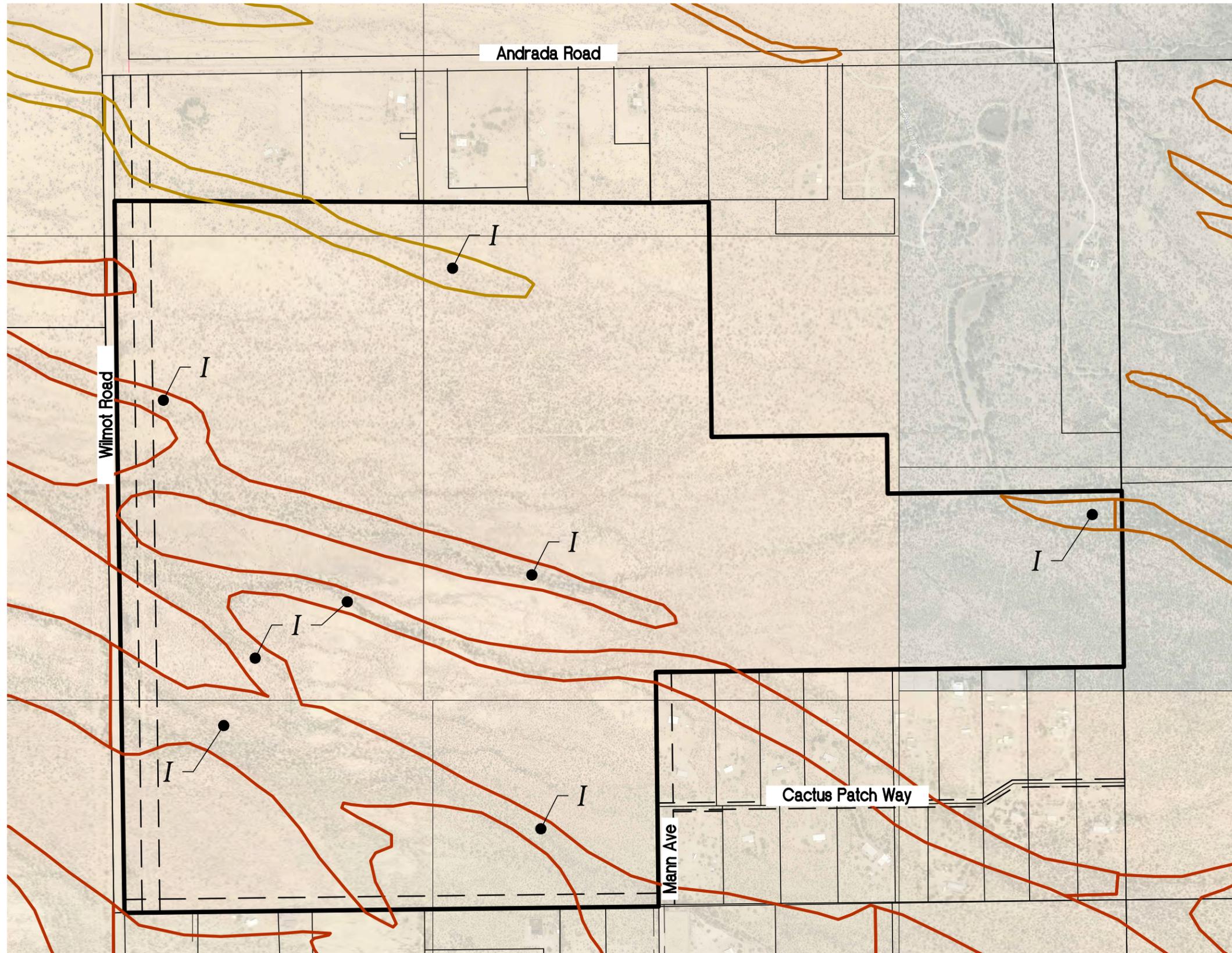


FIGURE I-D.10

VEGETATIVE COMMUNITIES AND ASSOCIATIONS

LEGEND

- Zone I Riparian Vegetation
- Zone II Sparse Vegetation
- Zone III Grazed Upland Vegetation

I-E. VIEWSHEDS

The area surrounding the property is either low density rural residential or undeveloped properties.

Photos of both the area within and to the exterior of the property were taken during a site visit and provide a general sense of the area.

FIGURE I-E.1 provides a key to the locations that the photos in FIGURE I-E.2 were taken.

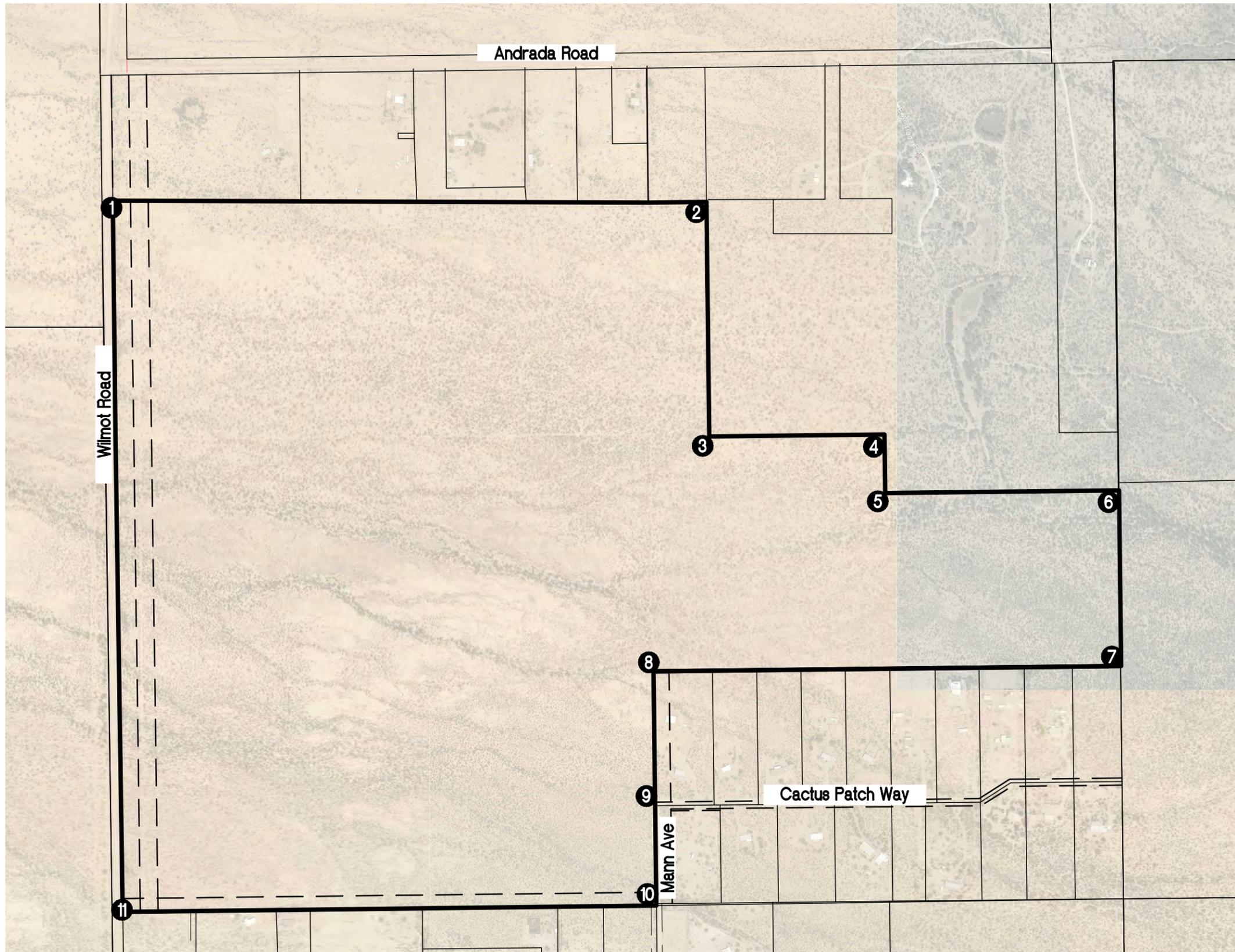


FIGURE I-E.1 VIEWSHEDS PHOTO KEY MAP

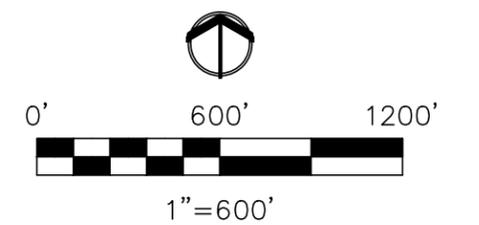


FIGURE I-E.2a SITE PHOTOS



Location 1. Looking northwest from property corner.



Location 1. Looking southeast into property.



Location 2. Looking northeast from property corner.



Location 2. Looking southwest into property.



Location 3. Looking northeast from property corner.



Location 3. Looking southwest into property.

FIGURE I-E.2b SITE PHOTOS



Location 4. Looking northeast from property corner.



Location 4. Looking southwest into property.



Location 5. Looking northeast from property corner.



Location 5. Looking southwest into property.



Location 6. Looking northeast from property.



Location 6. Looking southwest into property.

FIGURE I-E.2c SITE PHOTOS



Location 7. Looking northwest into property.



Location 7. Looking southeast from property.



Location 8. Looking northwest into property.



Location 8. Looking southwest from property toward existing residences.



Location 9. Looking northwest into property.



Location 9. Looking east down Cactus Patch Way.

FIGURE I-E.2d SITE PHOTOS



Location 10. Looking northwest into property, Mann Avenue heading north.



Location 10. Looking southeast toward residential property.



Location 11. Looking northeast into property.



Location 11. Looking southwest across Wilmot Road.

I-F. TRANSPORTATION

Roadway Summary

A Traffic Impact Analysis has been prepared for this property and is included in APPENDIX B.

Wilmot Road is a north/south roadway that borders the west side of the proposed site. It is currently an unpaved roadway that provides adequate width for one travel lane in each direction within a seventy-five foot right-of-way. Wilmot Road adjacent to this site is designated as a Medium Volume Arterial on Pima County's Major Streets/Scenic Routes Plans (MSSRP). The posted advisory speed limit on Wilmot Road in the vicinity of the site is 35 miles per hour. No curb, gutter, bike lane, or lighting facilities are provided along the roadway. Overhead utility lines run along the east side of the roadway.

Paving of seven miles of Wilmot Road, including along the frontage of this development is about to commence. The roadway improvements are being constructed by Pima County Department of Transportation and the Regional Transportation Authority. Once paving improvements are completed, Wilmot Road will be paved continuously from Interstate 10 to Sahuarita Road. Improvements will consist of two, eleven foot travel lanes with six foot paved shoulders with clear zone slopes of 4:1 or flatter.

Andrada Road is located approximately 800 feet to the north of the site. It is listed in the MSSRP as a medium volume arterial with 150 of future right-of-way. The existing "roadway" consists of an unpaved, very poorly graded, single travel lane for both the eastbound and westbound directions. There is no outlet on Andrada Road east of Wilmot Road. No curb, gutter or sidewalk facilities are provided. The north side of Andrada Road is paralleled by overhead utilities. Dimensions to nearby roadways are shown on I-F.1

Approximately 1.5 miles south of the site, Wilmot Road intersects with Sahuarita Road. In the area of Wilmot Road, Sahuarita Road has a posted speed limit of 50 miles per hour and offers one lane in both the eastbound and westbound directions with an eight foot paved shoulder. There is no existing curb, gutter or lighting.

The intersection of Wilmot Road/Sahuarita Road operates under two way STOP conditions. The northbound and southbound approaches to the intersection maintain one lane of traffic that is permitted to make a left, through and right turn movement. The eastbound and westbound approaches offer a shared left turn/through/right turn lane and operate under a free flow condition.

The Andrada Road intersection with Wilmot is a T-intersection. Andrada is stop sign controlled for the westbound (Andrada) approach of the intersection. There are no Andrada improvements and left or right turn movements are all made from the single unpaved lane. Northbound traffic on Wilmot can make through or right turn movements from a single lane. The southbound leg has a single, shared through/left turn lane.

Weekday AM and PM peak hour turning movement counts were taken in April 2016 at the intersections of Andrada Road/Wilmot Road and Sahuarita Road/Wilmot Road to form a basis for analysis of project impacts. Existing lane configurations, traffic control and traffic counts are shown in FIGURE I-F.1.

FIGURE I-F.1 EXISTING CONDITIONS

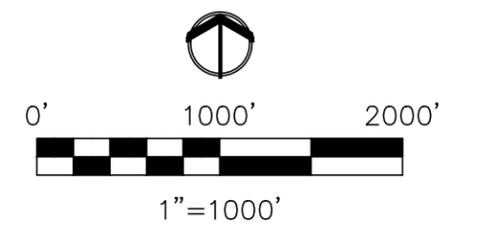
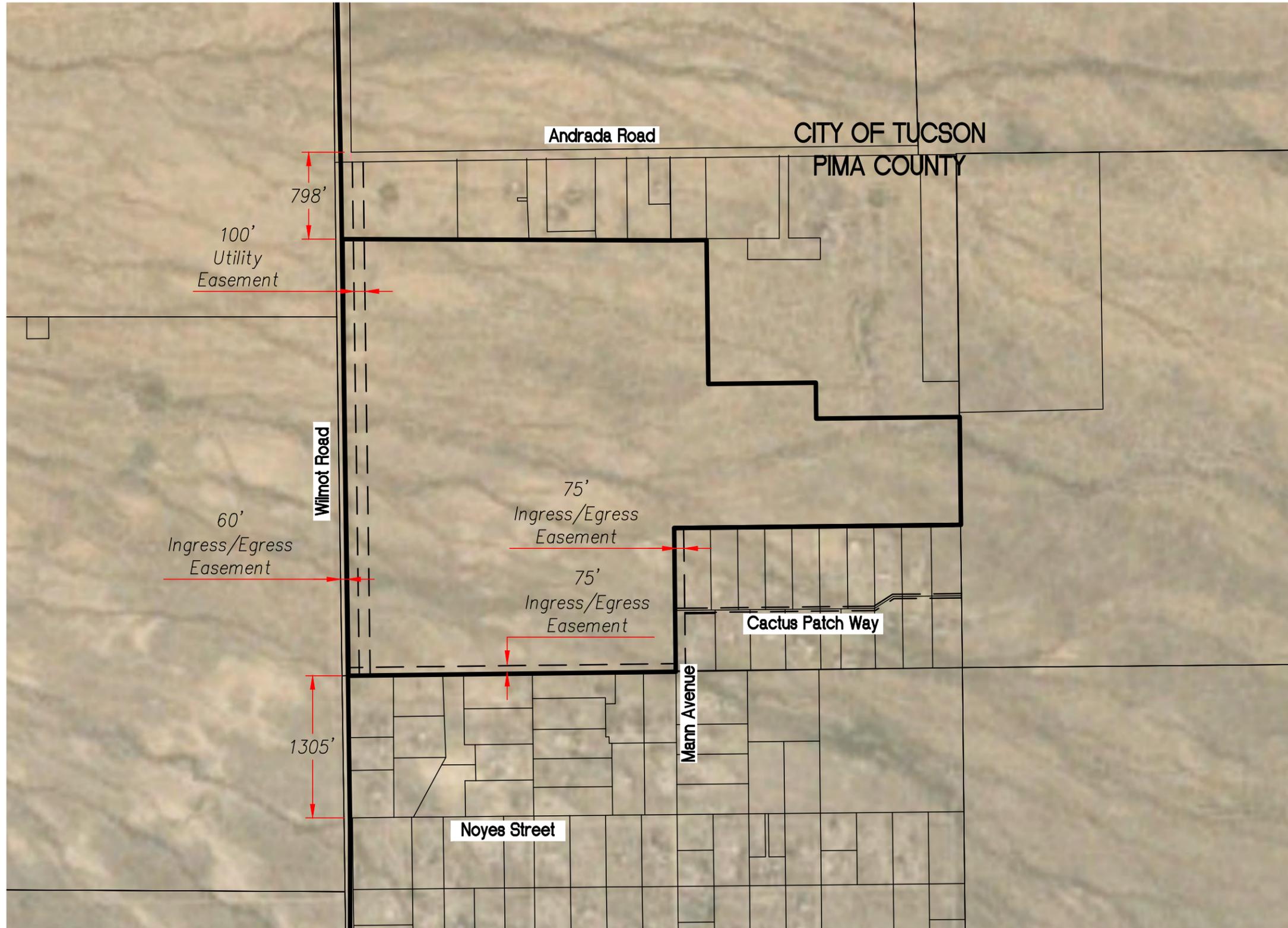
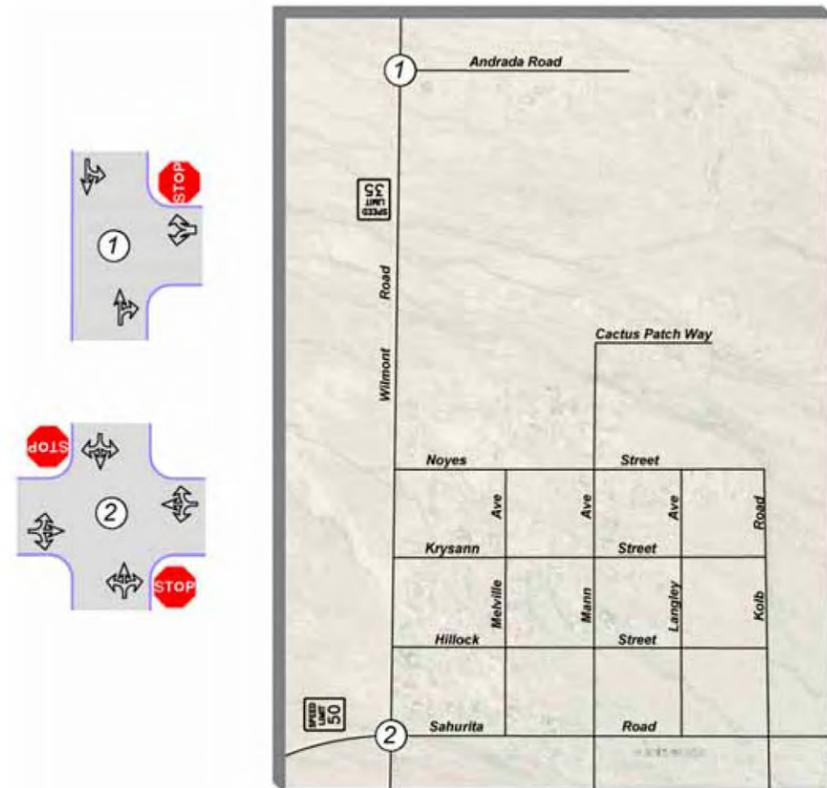
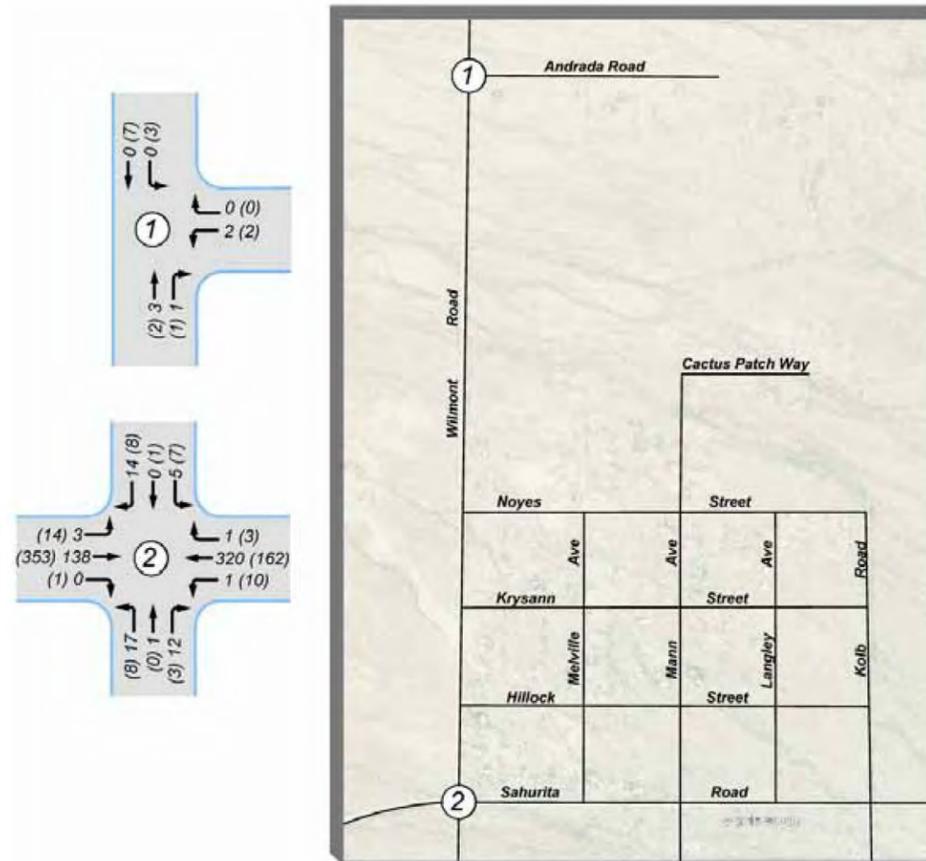


Figure 3 – Existing Lane Configurations and Traffic Control



LEGEND:
 = SPEED LIMIT
 = STOP SIGN

Figure 4 – Existing Weekday Peak Hour and Daily Traffic Volumes



LEGEND:
 XX = Weekday AM Peak Hour
 (XX) = Weekday PM Peak Hour
 Vehicle Trips Per Hour
 — NEW ACCESS
 — EXISTING ROAD



I-G. SEWERS

There are no nearby downstream wastewater facilities. The closest public, downstream sewer is located approximately 5.6 miles north of the site in Wilmot Road. Because the natural terrain slope is generally from west to east, it is not possible to connect at this location.

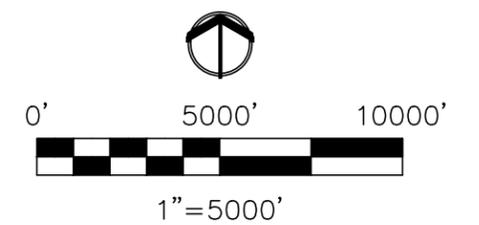
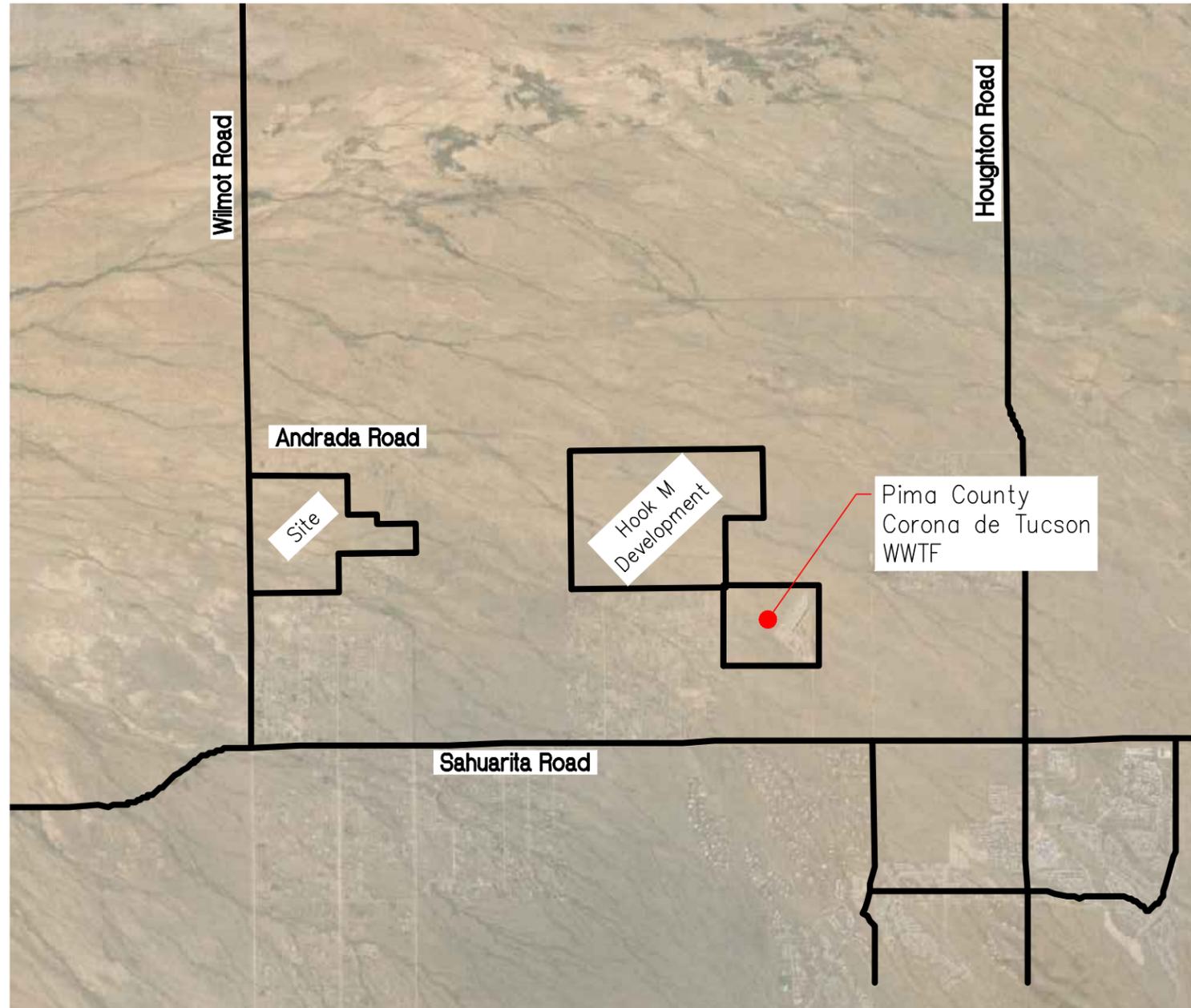
However, this project is located in the vicinity of the Corona de Tucson Water Reclamation Facility, which is shown on FIGURE I-G.1.

There are no site constraints to connecting to the existing public sewer other than the elevation rise between the proposed development and the Corona de Tucson facility. Connection to the upstream Corona de Tucson facility would require construction of a lift station to deliver wastewater to the plant.

The Corona de Tucson facility as currently constructed has excess treatment capacity. While capacity currently exists to serve some of the proposed units within this proposed project, there is not sufficient capacity to serve the entire project without plant expansion. It is understood that the excess capacity has previously been committed to other developments which at this time have not yet been constructed or have been constructed but not at the previously anticipated densities. Due to developments being constructed at less than full density and ongoing reductions in per capita sewer flows over the past few decades, a study should be performed to determine if there might be previously committed capacity that could be freed up.

The owner has met preliminarily with Pima County Regional Wastewater Reclamation Department to discuss the potential for obtaining sewer service via the Corona de Tucson facility. On a conceptual level the Department has indicated that such a solution is viable as the facility has the ability to meet the needs of this development provided that capacity expansion and the cost of the lift station and force main are provided by the property owner.

FIGURE I-G.1/2 EXISTING PUBLIC SEWER/SITE CONSTRAINTS



I-H. RECREATION AND TRAILS

Existing Parks, Recreation Areas and Trails

As shown on FIGURE I-H.1, there are no existing parks or recreation areas within one mile of the project site. There are, however, three parks and recreation areas within five miles of the site. These include the Pima County Fairground, the Sahuarita District Park, and Sycamore Canyon Neighborhood Park. Additionally, the Coronado National Park lays just outside of the site's 5-mile boundary as seen on FIGURE I-H.1.

The Pima County Fairgrounds and southeast regional park, located northeast of the site, consists of over 2,900 acres of recreation and park land. The Pima County Fairgrounds comprise a 640-acre event complex. The facility was designed for a diversity of uses including outdoor concerts, equestrian facilities, animal and livestock arenas, a motorized event arena, storage facilities, 15 acres of asphalt display areas, indoor and outdoor exhibit spaces, picnic areas, RV facilities and areas for outdoor camping. The facilities at the Pima County Fairgrounds include motorized event facilities that are subleased to Tucson Speedway, home of annual pavement racing events and Southwestern International Dragway.

Sahuarita District Park, a 49 acre facility, is owned by the County and located southwest of the site, off of Sahuarita Road adjacent to Walden Grove High School. The park is operated by Sahuarita Unified School District under an agreement with the Pima County Natural Resources, Parks and Recreation Department. That agreement stipulates that the district must provide "reasonable access" to the public. The park contains a stadium/track, baseball and softball fields, multi-purpose practice fields, and tennis courts.

Sycamore Canyon, a 13 acre neighborhood park located southeast of the site, includes a two-acre grassy field, basketball court, playground, ramadas, barbecues, and trails. A community pool, with lap lanes, is located just south of the park.

Trail Rights-of-Way

There are four planned trail rights-of-way within one mile of the project that are identified on the "Eastern Pima County Trail System Master Plan":

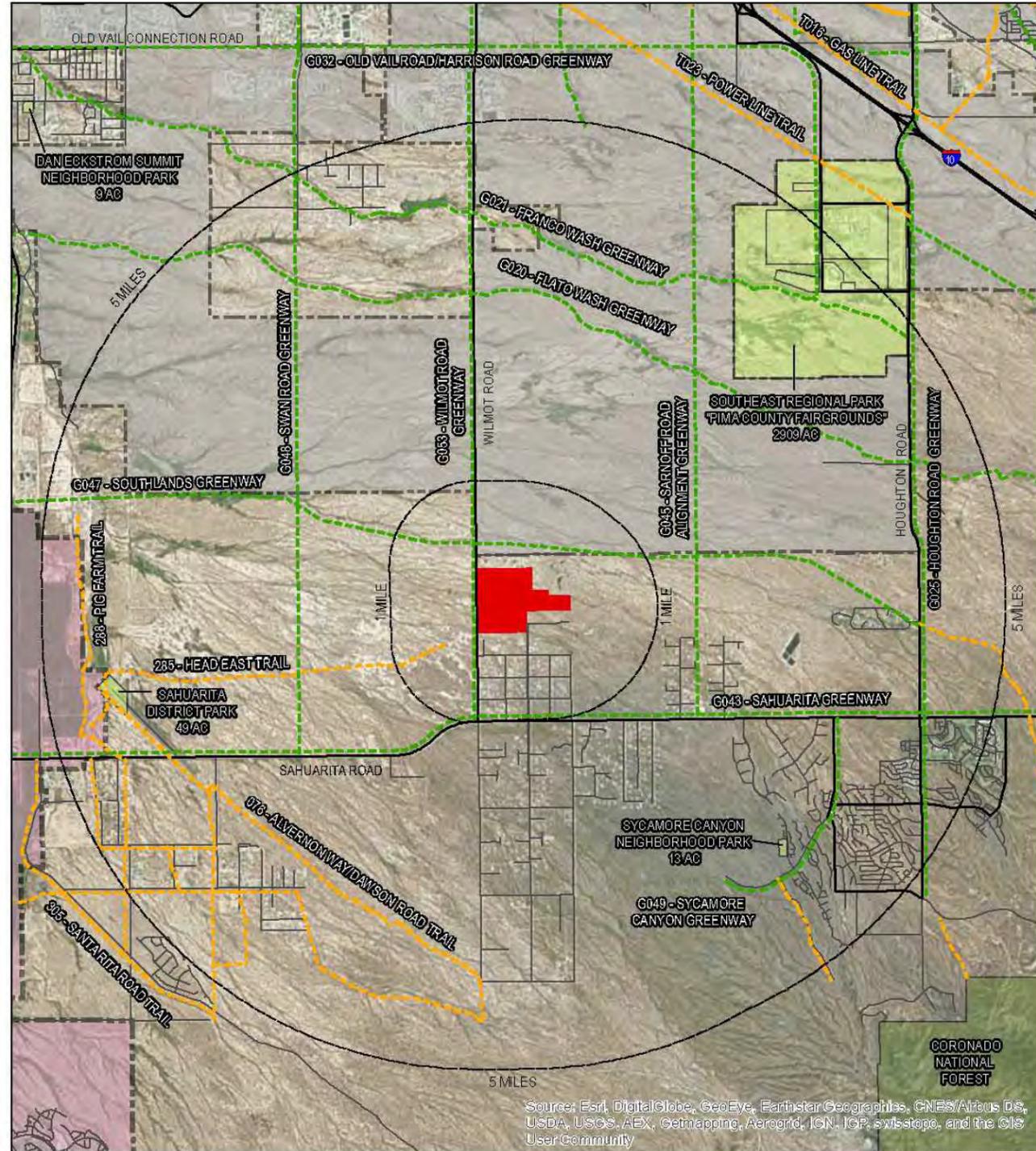
1. The Southlands Greenway runs east/west and is located just north of the project site.
2. The Head East Trail is located just south of the site, runs east/west and terminates just west of Wilmot Road.
3. The Wilmot Greenway runs north/south along Wilmot Road along the western boundary of the site.
4. The Sahuarita Road Greenway follows the Sahuarita Road east/west alignment south of the project site.

The planned greenways will be constructed using the Pima County Greenway cross-section which includes a 50 foot right-of-way (typical) with divided paths to accommodate residents and visitors on foot, bikes, skates, and horses.

FIGURE I-H.1, depicts the four future trails, described above, as well as many others within five miles of the project site. None of these trails have been completed or are currently scheduled for construction.

EXISTING RECREATION FACILITIES AND TRAILS

FIGURE I-H.1 EXISTING RECREATIONAL FACILITIES AND TRAILS



Not To Scale

I-I. CULTURAL RESOURCES: ARCHAEOLOGICAL AND HISTORIC SITES

The property is located in an area which has been identified as being in a *Low Sensitivity Archeology Zone*.

Two recent cultural resource reports were prepared on the property. The first report was prepared by P.A.S.T. in 2013. The report covers parcels 305-23-018A, 305-23-018C and 305-23-027B. The second report was prepared by Statistical Research, Inc. in 2015. This report covers parcel 305-23-0260. Both reports are included in APPENDIX C.

Based on site visits and observation, there has been no significant site disturbance since that time. The reports show two areas that had sufficient surface indications of archaeological materials on the property to meet the Arizona State Museum minimum standard for recording as an archaeological site. The first study finds a dispersed scatter of historical period artifacts from the first quarter of the 20th century over a 250 foot area. The second report identifies a single prehistoric cultural site which consisted of four to five small rock piles and a small number of flaked stone artifacts. In general, the rock piles are small and scattered and do not appear to be embedded within the ground surface. FIGURE I-1.1 shows the two areas mentioned above.

These reports will be updated prior to the submittal of the initial plat for this project.

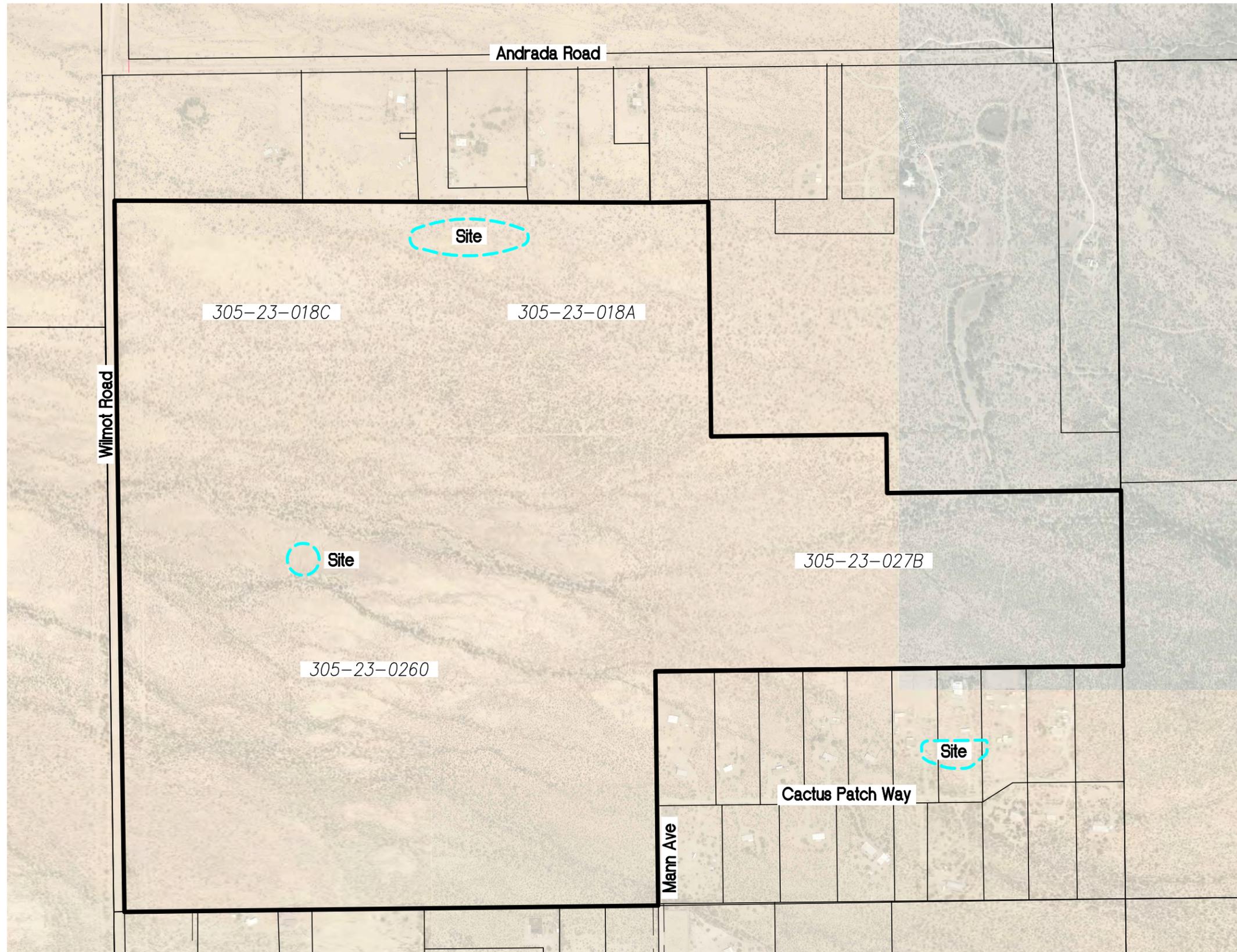
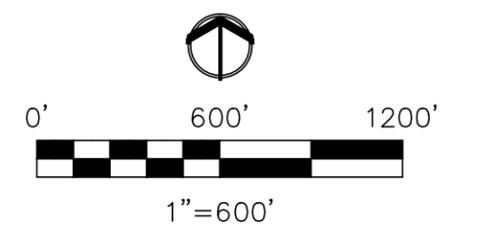


FIGURE I-1.2 CULTURAL RESOURCES ON-SITE



I-J. AIR QUALITY

This project has no industrial uses and therefore a review for Air Quality by the Department of Environmental Quality is not required.

The owner will fulfill all requirements for air quality to minimize dust during construction. All roadways within the development will be paved to reduce dust from vehicular traffic.

I-K. COMPOSITE MAP

A composite map is included as FIGURE I-K.1 and an acetate overlay is included in the pocket immediately behind the Figure.

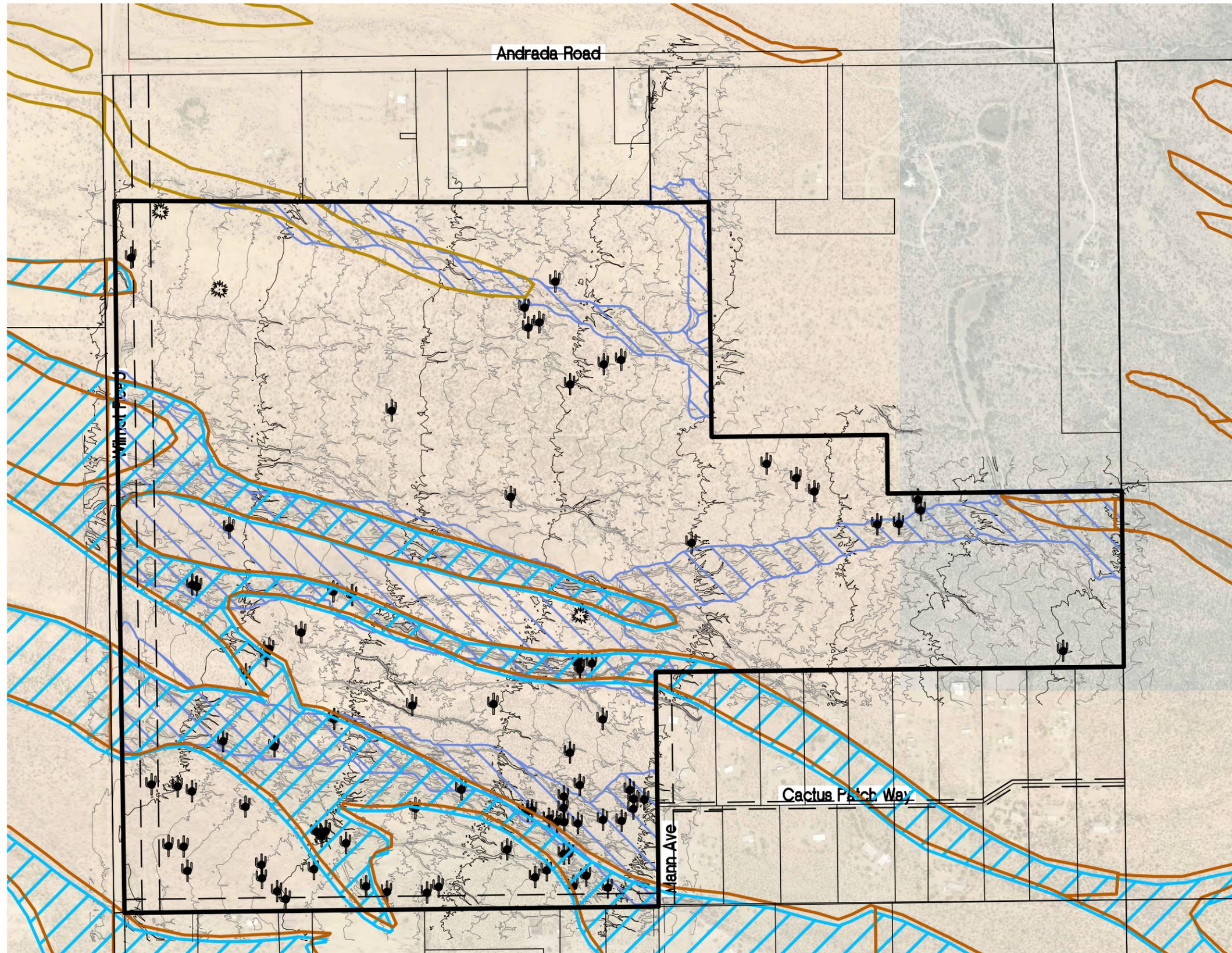
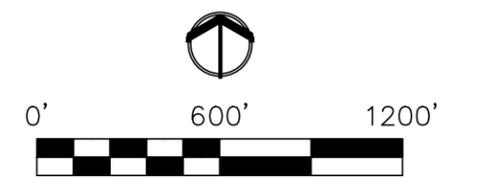


FIGURE I-K.1 COMPOSITE MAP

LEGEND

-  Topographic Elevation Contour Line
-  100-year Floodplain
-  Important Riparian Areas
-  Saguaro
-  Pima Pineapple Cactus
-  Significant Vegetation Areas



1"=600'
CONTOUR INTERVAL=1 FOOT

PART II - LAND USE PROPOSAL

II-A. PROJECT OVERVIEW

The Wilmot Park property will be developed to provide a residential community with varying lot sizes to accommodate multiple product types at varying residential densities.

This rezoning request is to rezone the entire property from its current RH to CR-5 with the Small Lot Option which will result in a single zoning district. The development will be constructed in phases as the demand occurs. Infrastructure (roadways, utilities, etc.) will be developed in phases as needed to serve each block of homes as they are constructed.

Development Characteristics

The project is located in the southeast area of the metropolitan Tucson region which is an area transitioning from unregulated, rural, lot-split development to an urban growth area. This change has been driven by many factors, including the City of Tucson's annexation of vast areas of Arizona State Land Trust Parcels, the Town of Sahuarita's East Conceptual Area Plan (SECAP) which calls for urban growth out to Kolb Road, Pima County's Designation of the Sonoran Corridor just six miles north of this site and the property's proximity to employment centers to the north.

The design and development of the Wilmot Park project reinforces the County's future vision for the area by integrating residential and recreational land uses while respecting the natural desert environment within the wash corridors that traverse the site. The proposed residential land uses are compatible with adjacent residential land uses, while providing an additional type of housing opportunity for the area. Planned elements such as Wilmot Road (a designated major street on the Major Street and Scenic Route Plan) and the Wilmot Road Greenway lay the foundation for the framework for future residential development in the area. The Wilmot Park development will complement existing and future planned uses in the area.

Under the Pima Prospers Comprehensive Plan a total of 1,077 homes would be allowed on the 359 acre project. This rezoning request is for a maximum of 800 single family homes on the project which is in accordance with the LIU 3.0 Plan designation. In addition, the project will comply with Special Area Policy S18 and Rezoning Policy RP-18.

The project will feature a variety of housing sizes and densities to create a community which offers opportunities to a diverse mix of purchasers. There will also be a block of higher density housing adjacent to Wilmot Road to support future transit if it should occur.

The design of the subdivision shall comply with the connectivity standards outlined in the 2016 Pima County Subdivision and Development Street Standards. Because the overall development exceeds 200 homes, the standard calls for four ingress/egress connections unless the boundary contains constraints such as existing unconnected development. Such development occurs along half of the north and the entire southern boundary. Those areas constitute approximately 40% of the overall development boundary, which

allows the number of ingress points to 2.4. The PDP provides three points of access, two onto Wilmot Road and one to the east for a future connection to the BLM property.

Project Response to Site Constraints

As discussed previously, the site is relatively flat and has relatively little vegetation. Because of that, coupled with the imminent start of Wilmot Road paving by Pima County as well as other previously noted development trends in the region, housing development is particularly attractive in this area.

This property has no areas that fall within the biological core or multiple use areas. Because the parcel is located within the Lee Moore watershed, there are a number of shallow natural flow areas that traverse the site; some of which have Important Riparian Areas associated with them.

Further, the area is not within ironwood or saguaro rich areas and the trees on the site (mesquites and palo verdes) are relatively sparse and short in stature due to past grazing of the land. The site is not affected by HDZ restrictions.

The Lee Moore Wash Basin Management Study established preliminary flood corridors within the region to ensure that adequate area was preserved to allow flow through capacity for surface water runoff and to protect primary riparian areas. This development has been laid out to have minimal impact to these flow corridors to provide for continuity of wildlife corridors.

Comprehensive Plan & Policies

This proposed development is compatible and in substantial conformance with the Pima County Comprehensive Plan, Pima Prospers. The property is located in the Southeast Planning Area and has a land use designation of Low Intensity Urban (LIU-3.0). The development also falls under, and complies with, Section E of *Special Area Policy 18 – Floodplain Management*. Section E is the *Lee Moore Wash Basin Special Area Policy (S18)*.

Goals and Policies from Pima Prospers that are reinforced by the proposed Wilmot Park development are included below (these items are taken verbatim from the Pima Prospers document).

3.1 Land Use

Goal 1 – Long Range Viability of the Region: Integrate land use strategies with physical infrastructure, human infrastructure, economic development, and resource conservation to ensure the long-range viability of the region.

Policy 1: Promote land use patterns that support healthy people, a healthy environment, and a healthy economy.

Policy 4: Support land uses, densities, and intensities appropriate for the urban, suburban, and rural areas of the unincorporated County.

Policy 5: Include regulatory floodplains and regulated riparian areas as open space priorities to maintain hydrologic integrity, wildlife corridor connectivity and contiguous open space corridors.

3.5 Housing and Community Design Element

Goal 1 – Housing: Livable Communities: Create livable, viable, multi-generational communities

- Policy 1: Ensure a safe, diverse, and quality housing supply for all income ranges for existing and future populations.
- Goal 8 – Community Design: Ensure that all development and redevelopment is generally compatible and scale-appropriate.
- Policy 2: Continue to use appropriate transitions for dissimilar types of development and provide connectivity to trails, pedestrian walkways, and bicycle routes.
- Policy 4: Include trees and other landscape elements as design mechanisms in creating scale appropriate developments.
- Goal 10 – Character of the Area: Ensure that all new development and redevelopment reflects the character and sense of place of the area
- Policy 1: Define an authentic identity and sense of place at appropriate scales in urban and suburban areas in a manner that reflects the character, identity, cultural heritage, and Sonoran Desert setting.
- Policy 2: Encourage development in suburban areas to be integrated with its Sonoran Desert setting by:
- Encouraging a Sonoran Desert color palette that is not limited to earth tones;
 - Incorporating the site's prominent existing natural features (rock formations, etc.) as part of the design, where appropriate;
 - Supporting contemporary and energy efficient versions of vernacular architectural styles;
 - With the exception of local food production, continue to utilize a drought-tolerant plant palette that emphasizes both the use of native species and precludes the use of non-native invasive plant species near public preserves and natural open spaces;
 - Establishing trail linkages to surrounding natural areas; and
 - Maximizing the use of shade devices where most appropriate including planting trees for pedestrians.
- Goal 14 – Green Building: Encourage green building and site design methods, techniques, and materials.
- Policy 1: Decrease heat island effect and reduce water run-off through site development strategies.
- Policy 2: Reduce outdoor water use by encouraging water-efficient practices such as:
- Low water use, drought tolerant or native vegetation (xeriscapes) with the exception of local food production;
 - Drip irrigation;
 - Increase use of reclaimed water and rainwater harvesting; and
 - Low Impact Development (LID) principles such as preserving and recreating natural landscape features and minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product where applicable and feasible.

4.2 Water Resources Element

Goal 1: Achieve water sustainability through comprehensive integrated planning that coordinates water supply, demand management, climate variability, economic growth and respect for the environment.

Policy 6: Promote the efficient utilization of existing infrastructure and the prudent construction of additional infrastructure needed for a safe, reliable and renewable water supply.

4.9 Flood Control and Drainage Element

Goal 1: Minimize flood and erosion damages for all County residents, property and infrastructure.

Policy 5: Require that drainage improvements are consistent with the overall character of the area and do not create nor worsen existing drainage problems.

5.3 Parks and Recreation Element

Goal 1: Support healthy lifestyles through the provision of parks and recreation.

Policy 3: Continue to provide a diverse range of park types, functions and recreational opportunities to meet the physical and social needs of county residents.

Parcel 305-23-0260 (185-acre southernmost parcel) falls under *Regional Plan Policy 118 – S. Wilmot Road (RP-118)*. The balance of the property does not fall under any Rezoning Policy. The policies listed below are taken verbatim from RP-118.

- A. The planning and development of the subject site shall occur such that transportation, wastewater, recreational, and other major infrastructure, and the protection of riparian areas and other natural resources are integrated and coordinated.
- B. The property shall be developed at an overall density of four residences per acre.
- C. A mix of housing types shall be provided to ensure a diverse community. Residential densities shall support multi-modal transportation opportunities including public transit even if such transit facilities are not currently in close proximity.
- D. Lands subject to this Comprehensive Plan amendment will be surveyed for presence of the Pima pineapple cactus and its habitat. Surveys shall be conducted by an entity qualified to perform biological surveys. Surveys shall be done according to the most recent protocol approved by the U.S. Fish and Wildlife Service. A report containing the results of these surveys and copies of any data collected shall be provided to Development Services as part of any subsequent rezoning application(s). The date of the survey should not exceed one year prior to the submittal of any subsequent rezoning. If Pima pineapple cacti are found to be present on the project site, a copy of the report shall also be sent to the Arizona Game and Fish Department's Heritage Data Management System.
- E. To the best extent possible, the northwest and southwest quadrants of the subject property, outside of the land impacted by the Important Riparian Areas, shall be developed at a minimum density of five residences per acre to promote transit opportunities, with adequate buffers to the south, which will be determined during the rezoning/specific plan phase.
- F. The developer will cooperate with Vail School District to formulate mutually beneficial and acceptable agreements addressing the needs of the District.
- G. The developer shall submit a Master Traffic Impact Study that identifies existing conditions and capacity, needed construction and expansion to achieve necessary infrastructure. Phasing, implementation and the regional impacts of this development shall also be addressed. The Study shall be submitted with the Rezoning Site Analysis.
- H. Wastewater policies:
- I. The owner/developer shall construe no action by Pima County as a commitment to provide sewer service to any new development within the plan amendment area until Pima County executes an agreement with the owner/developer to that effect.
- J. The owner/developer shall prepare a study of the sewer basin at his or her sole expense for the purposes of determining the routing and sizing of all off-site and on-site public sewer facilities necessary to provide both conveyance and treatment capacity and service to the plan amendment area and any tributary properties

upstream or downstream of the rezoning area. (This requirement may be waived by the Pima County Regional Wastewater Reclamation Department if it determines that an acceptable study of the sewer basin has been recently completed). The sewer basin study must be approved by the Pima County Regional Wastewater Reclamation Department before any rezonings may be approved within the plan amendment area.

K. Upon approval of the basin study, the owner/developer shall enter into a master sewer service agreement with Pima County that specifies the improvements to be made to Pima County's public sewerage system and their timing.

I. The owner/developer shall fund, design and construct the necessary wastewater collection, conveyance and treatment facility improvements necessary to serve the plan amendment area, as determined by the basin study, and in accordance with the area wide basin study that is to be prepared for the Swan Southlands project.

J. A cultural resources survey shall be conducted for any area where one has not been done, with mitigation measures developed for any identified cultural resources, as necessary. If required, a cultural resources mitigation plan will be submitted to the Pima County Office of Sustainability and Conservation— at the time of, or prior to, the submittal of any tentative plat or site specific development plan – fulfilling the requirements prescribed by the Office of Sustainability and Conservation

The intent of this proposed development is to create a residential project that is in accordance with all policies stipulated in both Special Area Policy 18E and Rezoning Policy 118. However, there are two specific policies listed above that have raised a concern with residents in the surrounding neighborhood. The policies which they object to are:

B: The property shall be developed at an overall density of four residences per acre.

E. To the best extent possible, the northwest and southwest quadrants of the subject property, outside of the land impacted by the Important Riparian Areas, shall be developed at a minimum density of five residences per acre to promote transit opportunities, with adequate buffers to the south, which will be determined during the rezoning/specific plan phase.

To accommodate neighbors' concerns, while still attempting to meet the intent of the Policies, the owner of the project will develop the property at a density of four residences per acre on the developable area (net of major infrastructure, drainage, open space, buffers, etc.) Also to promote future transit opportunities, the owner commits to having the highest density within the development along Wilmot Road corridor, however not in the southern portion of the property.

The owner has finalized an agreement with Vail School District which is included in Section II-L.

The owner has committed to specific conservation measures discussed in the Sustainability Principles section below as well as in the Preliminary Integrated Water Management Plan.

Neighbor Concerns & Impact to Existing Land Uses

The property along the easternmost portion of the site is owned by the Bureau of Land Management and the property to the west, across Wilmot, is owned by the Arizona State

Land Trust. The other adjacent properties are unsubdivided residential lots of approximately four acres in size.

Meetings with area residents were held on September 14 and 22, 2016 in accordance with Pima County's requirements for rezoning. The primary concerns other than those discussed in the previous paragraphs were associated with buffers between the properties to the south and the proposed development.

The owner committed to the following items during the meeting which have been reflected on the Preliminary Development Plan.

1. A 100 foot buffer will be provided along the entire southern boundary with an area of enhanced vegetation varying from 20 to 40 feet in width.
2. The collector roadway will lie immediately adjacent to the 100' buffer along the majority of the southern boundary of Parcel 305-23-0260 (185-acre southernmost parcel).
3. Only single story housing will be allowed in the first row of housing along the buffer.

An agreement letter is being prepared and when completed will be included in APPENDIX E: NEIGHBORHOOD AGREEMENT LETTER.

Smart Growth

The planning of Wilmot Park embraces the Smart Growth principles and the project will be designed to incorporate sustainable features. The rezoning request includes the Small Lot Option. This will allow for mixed land uses and will accommodate compact building design which will maximize the variety of housing opportunities to be attractive to a diverse population. The project will include a minimum of one housing block with a net density of 4.5 RAC along Wilmot Road which will provide the opportunity for future linkages to transit.

In addition, the project will include internal recreation facilities and a system of trails which provide safe, attractive and accessible pedestrian and bike linkages from all neighborhoods to the proposed recreational facilities and to Wilmot Road. This will encourage transportation modes other than automobiles, particularly for trips within the community.

The project will also set aside riparian areas which will serve as drainage flow corridors but will also create permanently preserved open space and additional opportunities for passive recreation elements.

Wilmot Park will be designed with distinctive signage and hardscape to create an attractive community with a strong sense of place.

Sustainability Principles

Wilmot Park will follow a number of criteria to promote sustainable development and green building concepts. Efforts will include site design guidelines as well as minimum home design criteria.

Site Design

The project is being designed to take advantage of small lots and density to allow 33% of the site to be left as open space. The property is located along Wilmot Road which has been listed as a Medium Volume Arterial north of this site. Wilmot Road is about to be paved and is considered a candidate to be a future transit corridor. To reduce automobile dependence, the site will also include both walkable streets as well as a series of pedestrian and bicycle trails which will link neighborhoods with the recreational facilities and Wilmot Road.

The project will allow use of active solar facilities and promote passive solar through lot/home orientation and will minimize grading through conscientious design practices which will balance onsite cuts and fills. The site will preserve the existing riparian corridors and provide an opportunity for the native plants to recover from past grazing practices. In developed areas, landscaping will be primarily with native plant materials. Water harvesting will be utilized to offset landscape irrigation needs where possible within Common Areas.

Housing Design

Housing will also be required to include sustainable standard features. Plumbing fixtures in all homes will be required to meet WaterSense standards. In addition, all homes will be required to stub out gray water plumbing and will have on-demand hot water circulation systems. All homes will also be required to have roof gutters and downspouts that tie into either a rain water harvesting system or infiltration systems. Further, water features and misting systems will not be allowed within the development.

Pima County Zoning Code

Development of the Wilmot Park will be done in strict conformance with Pima County's Native Plant Preservation and will comply by utilizing the set-aside method, as described in the Pima County Code of Ordinances Chapter 18.72.090. A minimum of 30% (approximately 107.7 acres) of the site with the highest resource value will remain natural open space, wherein development shall not occur. Where possible, every effort will be made to allow significant native plants to remain in place. This will be the case in all of the flow corridors. Where plants cannot be maintained in place, plants will be relocated to bufferyards or to enhance vegetation within the flow corridors.

II-B. PRELIMINARY DEVELOPMENT PLAN (PDP)

Wilmot Park will be a phased residential development of approximately 359 acres. This Site Analysis will follow the requirements for *large projects* as the project will:

- Have a master block plat followed by a series of individual plats as phasing progresses on the overall project,
- Be controlled by a development agreement to be entered into between the property owner and the County,
- Be developed in multiple phases, and
- Include residential uses.

As such, a general description of the proposed development concepts is presented herein. The developer will submit more detailed plans at the time of the initial platting effort.

This rezoning request is for CR-5 with the Small Lot Option which will maximize product flexibility.

The Preliminary Development Plan conceptually shows the location of development blocks, major roadway infrastructure and those flow corridors which will remain natural. Access to the project will be from Wilmot Road and the development will provide two points of access onto that roadway. In addition to the internal roadway circulation system shown on the PDP, pedestrian/bicycle trails will provide non-automotive circulation routes, which will be shown in more detail on the initial master plat. In addition, the PDP shows a sample of what lotting may look like in several locations along the perimeter of the project. These lotting sketches are conceptual. Lot sizes and actual lotting configuration will not be determined until plats for individual blocks are submitted.

The Project has been designed to conserve large tracks of riparian areas throughout the development. Pima County’s Development Standards require 30% open space which establishes the minimum open space requirement as 107.7 acres. As designed, the project proposes to meet that requirement.

	Area (acres)	Area (percent)
Wilmot Park Acreage	359	100%
Required Open Space	107.7	30%
Proposed Open Space	108.0	30%

As mentioned in the previous section, the owner is committed working out the conflicting conditions between RP-118 and concerns of the area neighbors. This PDP attempts to strike a compromise position between the conflicting conditions while still complying with the intent of all conditions.

Development Density:

Conflict – Although RP-118 calls for an overall density on Parcel 305-23-0260 of four residences per acre with some homes along Wilmot Road having a minimum density of 5 RAC to support transit, an agreement made by the previous property owner committed to a maximum density of 3 RAC.

Proposal – The entire development will be constructed at a maximum gross density of 3 RAC but with a net density (exclusive of major infrastructure, open space and flow corridors) of 4 RAC. In addition, there will be at least one block of homes adjacent to Wilmot that will have a net density of 4.5 to 5 RAC.

The Preliminary Development Plan has been created in such a way that it preserves the major washes. At the block plat or initial platting stage, the boundary of these flow corridors will be legally established and the corridors will be restricted as permanent open space. The majority of the County's Important Riparian Areas lie within these washes. However, we have found that existing topographic conditions do not strictly follow the current delineation of the Important Riparian Areas which were previously established by Pima County. As part of that initial plat, a vegetative analysis will be prepared to identify the location of significant riparian areas, tie them to the current locations of major flow corridors and protect them where warranted.

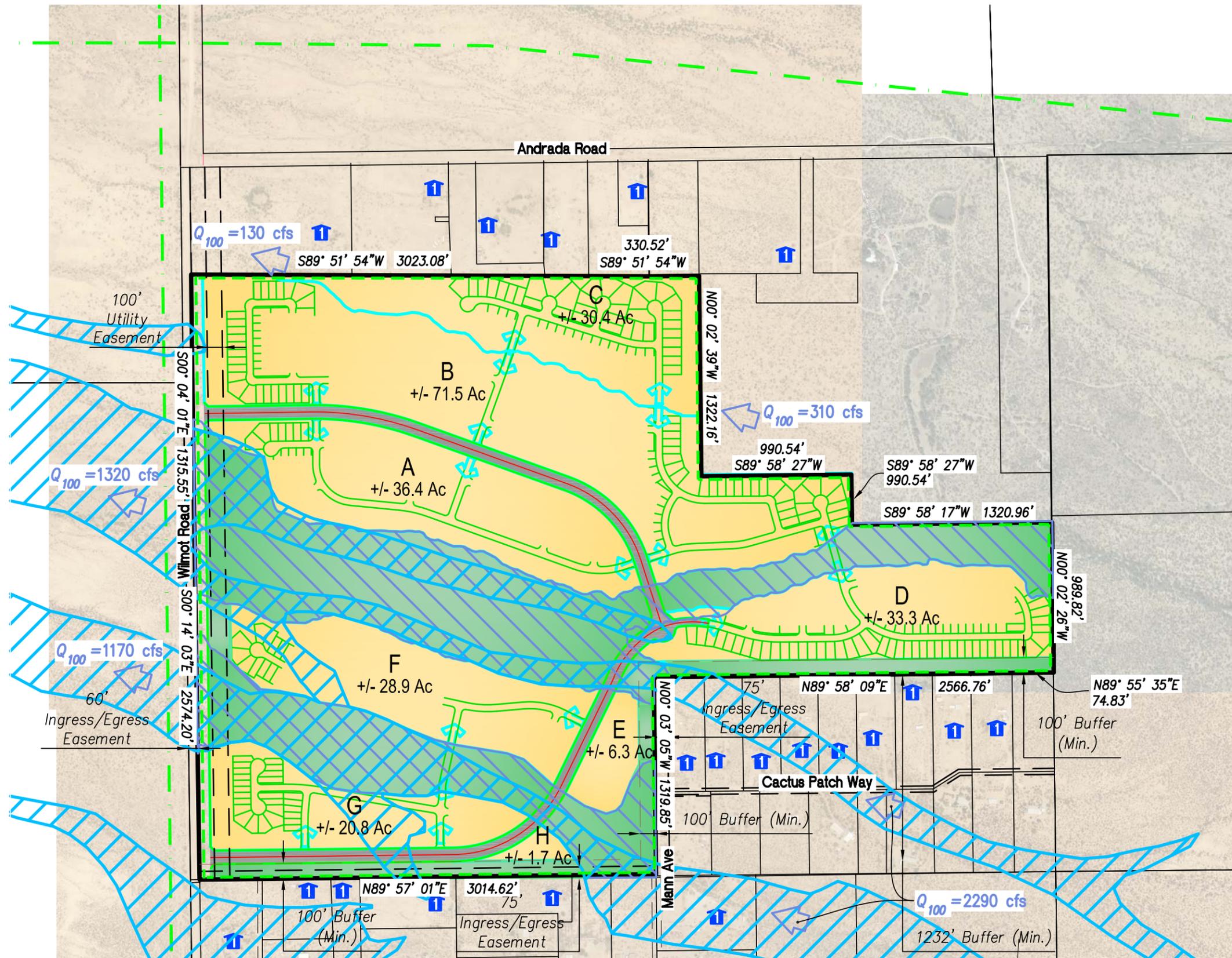
The area outside of the flow corridors and major infrastructure will be developed as residential blocks and will provide a variety of housing products from small lot CR-5 blocks to larger rural one-acre lots within the 300 foot buffer discussed above on Parcel 305-23-0260. The highest density will be adjacent to Wilmot Road to accommodate future transit corridors if they are constructed.

As stated previously, the PDP reflects the commitment of increased separation along the southern boundary which includes:

1. A 100 foot buffer along the entire southern boundary. The buffer will be left essentially natural other than:
 - a. Where necessary to convey surface runoff – any disturbed areas will be revegetated.
 - b. Enhanced vegetation will be installed along the southern portion of the buffer which will vary from 20 to 40 feet in width. This enhanced area will include native, drought tolerant trees, cactus and shrubs and will have irrigation during a reasonable establishment period.
2. Only single story housing will be allowed in the first row of housing along the 100 foot buffer which runs along the southern boundary of the property.
3. Internal trail system will be kept away from 100 foot buffer along southern property line to discourage trespassing and minimize interaction with existing residents.

Landscape buffers around the entire property will be provided in accordance with Pima County Bufferyard requirements. More detailed description of project elements is included in the following sections.

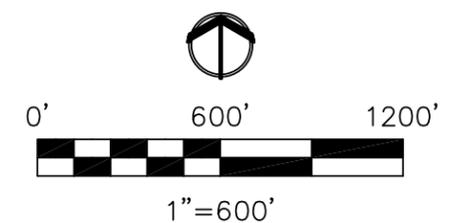
FIGURE II-B.1 PRELIMINARY DEVELOPMENT PLAN



LEGEND

- Existing Building and Number of Stories
- Planned Future Greenway
- 100-year Floodplain
- Important Riparian Areas
- Bufferyard "C"

Note: The internal circulation system shown on this PDP is conceptual. The final configuration will be determined at the time of future plat submittals subject to Street Layout and Connectivity provisions in the Pima County Subdivision Street Standards.



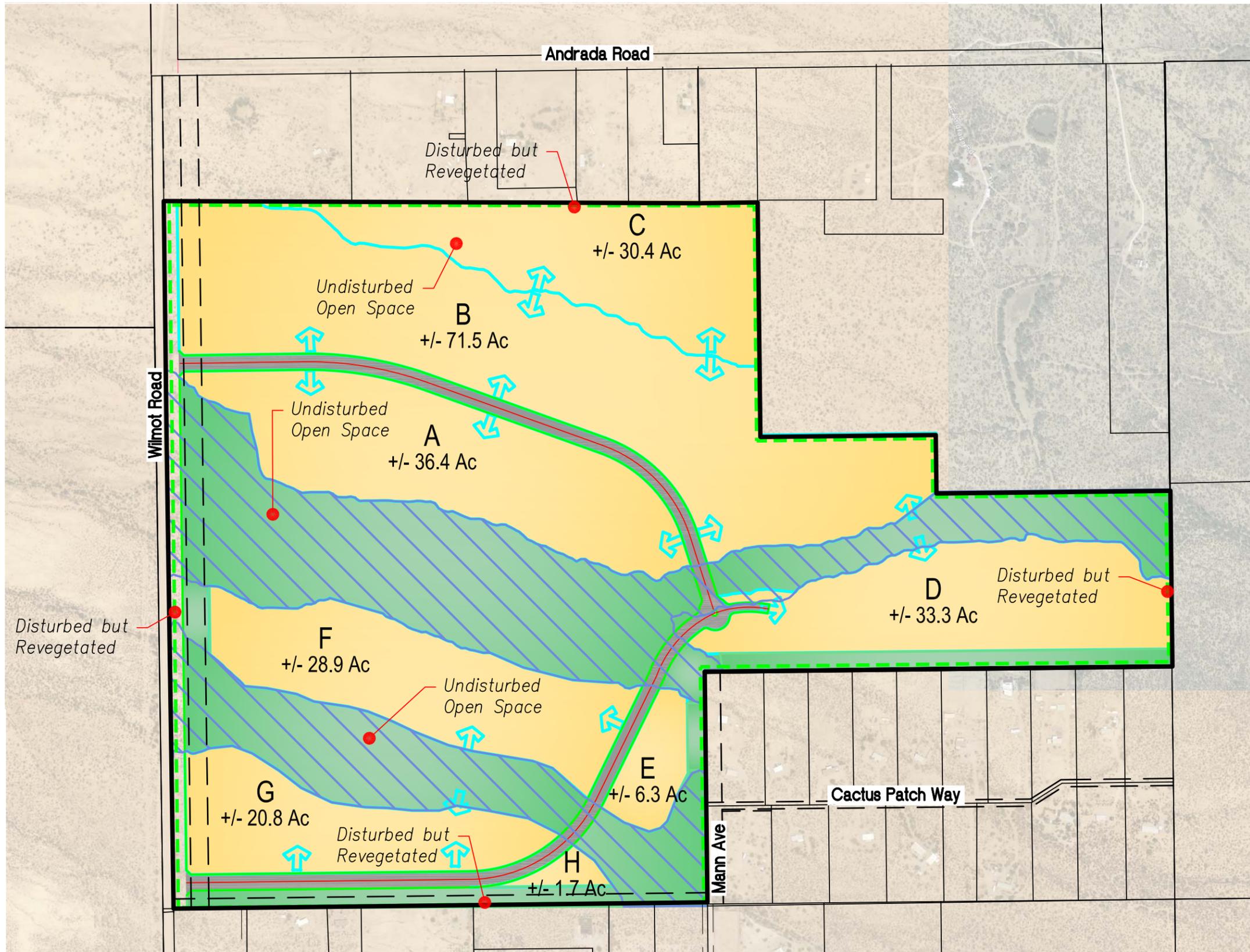
II-C. TOPOGRAPHY AND GRADING

There are no slopes of 15% or greater within this property and therefore this property does not fall under the regulations of Pima County’s Hillside Development Zone. Due to the relatively gradual terrain on this site, it is not expected that the existing ground elevation will be changed by more than five feet (in either fill or cut) anywhere on this site.

A total of 108 acres (30% of the total property) will be left in its natural state. The natural areas will be within dedicated floodplains which will include the properties’ riparian areas.

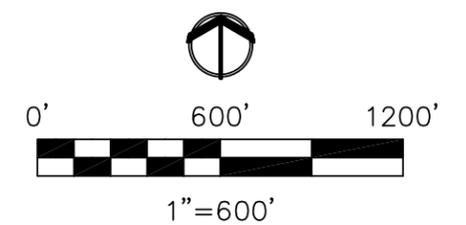
Project Elements	Remain Natural (acres)	Permanently Disturbed (acres)	Disturbed / Reclaimed (acres)	Total Area (acres)
Flow Corridors	108			108
Roadway Corridor		18		18
Development Blocks (w/o Bufferyards)		228		228
Perimeter Bufferyards			5	5
Total Acreage	108	246	5	359
Percent of Total	30%	69%	1%	

FIGURE II-C.1 SITE GRADING



LEGEND

--- Bufferyard "C"



II-D. HYDROLOGY

The project will be designed and constructed in such a manner that it is consistent with Pima Prosper, Pima County's Comprehensive Plan, including Special Area Policy 18-E, *Lee Moore Wash Basin Special Area Policy*. The project will be designed and constructed following the *Development Criteria for the Lee Moore Wash*.

As part of this Site Analysis, an updated hydraulic analysis has been prepared for the property utilizing new topographic mapping. The analysis utilized the flow volumes and flow corridors established within the *Lee Moore Wash Basin Management Study*. However, the study utilized newly prepared topographic mapping (1"=40' with one foot contour intervals) which has a higher level of accuracy than what was available for the previously prepared regional basin analysis.

The new analysis ran a current conditions FLO-2D model utilizing the flow volume data from the County's study to establish a baseline condition. A second FLO-2D analysis was then prepared allowing onsite encroachment into the flooded areas. The encroachment was modeled to allow a maximum increase of flow depth within the property of 12 inches while maintaining existing condition flow characteristics at the upstream and downstream site boundaries. The proposed final flood prone areas from this analysis are shown on FIGURE II-D.1

The County is currently initiating construction of Wilmot Road adjacent to this project. The proposed construction maintains elevations that are consistent with the grades of the unpaved roadway. Design and construction of this proposed new development will result in flow volumes, depths and velocities that are consistent with the Wilmot Road improvement design criteria.

This development will be in accordance with all applicable basin management policies and the Pima County Development Standards and consequently post-development discharges leaving the site will not be increased over pre-development quantities. This will be accomplished through the use of individual block retention/detention systems. The specific locations of these proposed basins and their exact outlet points cannot be determined until the time of individual block subdivision platting and engineering.

Roadways and utilities will be required to cross or encroach into the flow corridors at certain locations to provide access to all parts of the development. Roadway culverts will be designed to minimize changes to the water flow to reduce the potential of upstream sedimentation or downstream scour.

A detailed master drainage study will be submitted along with the initial plat document. This master drainage study will be at a higher level of design and will finalize the location of the flow corridor perimeters and establish appropriate building setbacks as a result of scour analyses. It will also provide detailed hydrologic calculations for existing flows and any changes to existing conditions which would be created by the development of the infrastructure associated with the major infrastructure, i.e. roadway culverts, inlet and outlet protection, sidewalk scuppers, etc.

At such time as a Tentative Plat is submitted for each of the proposed residential blocks, a detailed hydrologic and hydraulic analysis will be submitted which will address the increased flow volumes created by the block development, capacity of drainage

structures required within that block and retention/detention basin sizing to mitigate increases in runoff prior to leaving the site.

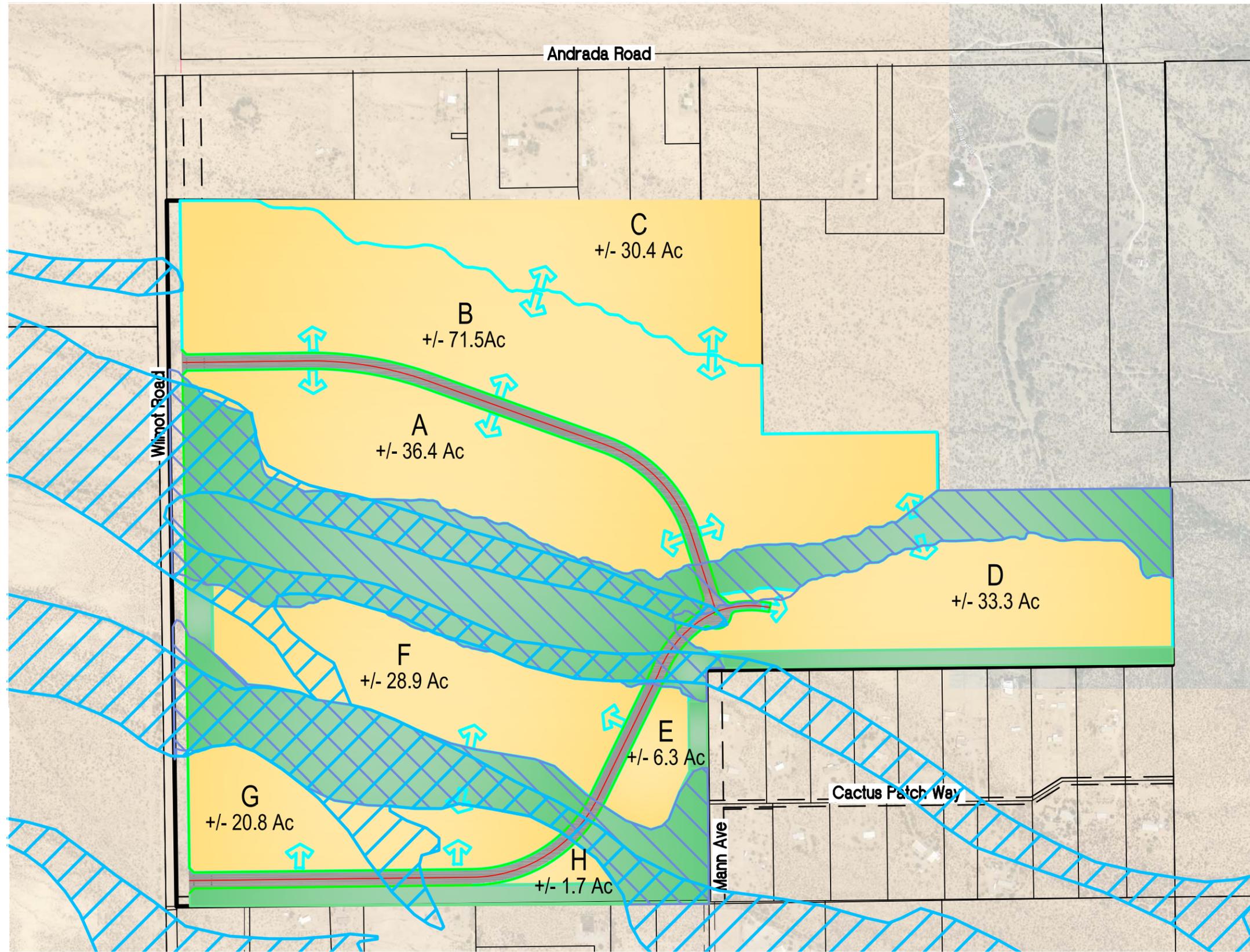
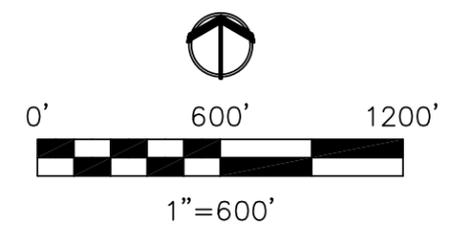


FIGURE II-D.1 PROPOSED PRELIMINARY FLOW CORRIDORS

LEGEND
Important Riparian Areas
Lee Moore Wash Flow Corridor



II-E. BIOLOGICAL RESOURCES

As discussed in Part One – Existing Conditions, the vegetation on the site has been moderately to severely impacted by long term grazing on the property. Further, because the flow corridors are the areas with the majority of vegetation and they will be left essentially in their natural state, the impact of development on the vegetation of the site will be minimal.

The Wilmot Park project will create significant permanent open space as part of the development by setting aside natural flow corridors over 33% of the total site. Vegetation within the flow corridors will be undisturbed except where a roadway or utility crossing is necessary. In those areas where the flow corridors are crossed due to a required utility crossing, the disturbed area will be revegetated following construction.

Where practical, vegetation removed from the site due to development may be replanted within the flow corridors to increase the vegetative value of those corridors.

All work will be performed in compliance with the Pima County Native Plant Preservation Ordinance (NPPO). Where possible, saguaros and Pima pineapple cactus will be preserved in place. Because the existing topography will not require severe site cuts or fills, in many areas it will be possible to incorporate significant vegetative features into the development concepts. Where it is not possible to maintain these plants in place, we will attempt to move them into perimeter bufferyards or to use them to revegetate open space within existing riparian areas. For those specimens that are unable to be relocated due to size or health, mitigation will be used in accordance with the NPPO requirements.

II-F. LANDSCAPE AND BUFFER PLAN

The landscape bufferyards within the Wilmot Park development will comply with Pima County Code of Ordinances Chapter 18.73.040 and the Landscape Design Manual. The intent of the landscape bufferyards is to provide a perimeter setback and visual buffer between the project and adjacent properties. To the south, southeast and north there are existing residential properties and to the east is land owned by the United States Bureau of Land Management. Since all immediately adjacent property to the north, east and south is designated as Rural Homestead (RH), the requirements outlined as Bufferyard C in the Landscape Design Manual will be required. The western boundary of the site is Wilmot Road, a public street classified as a medium volume arterial on the Major Streets and Scenic Routes Plan (MSSRP), and therefore Bufferyard C standards will apply. See FIGURE II-F.1 for landscape bufferyard locations.

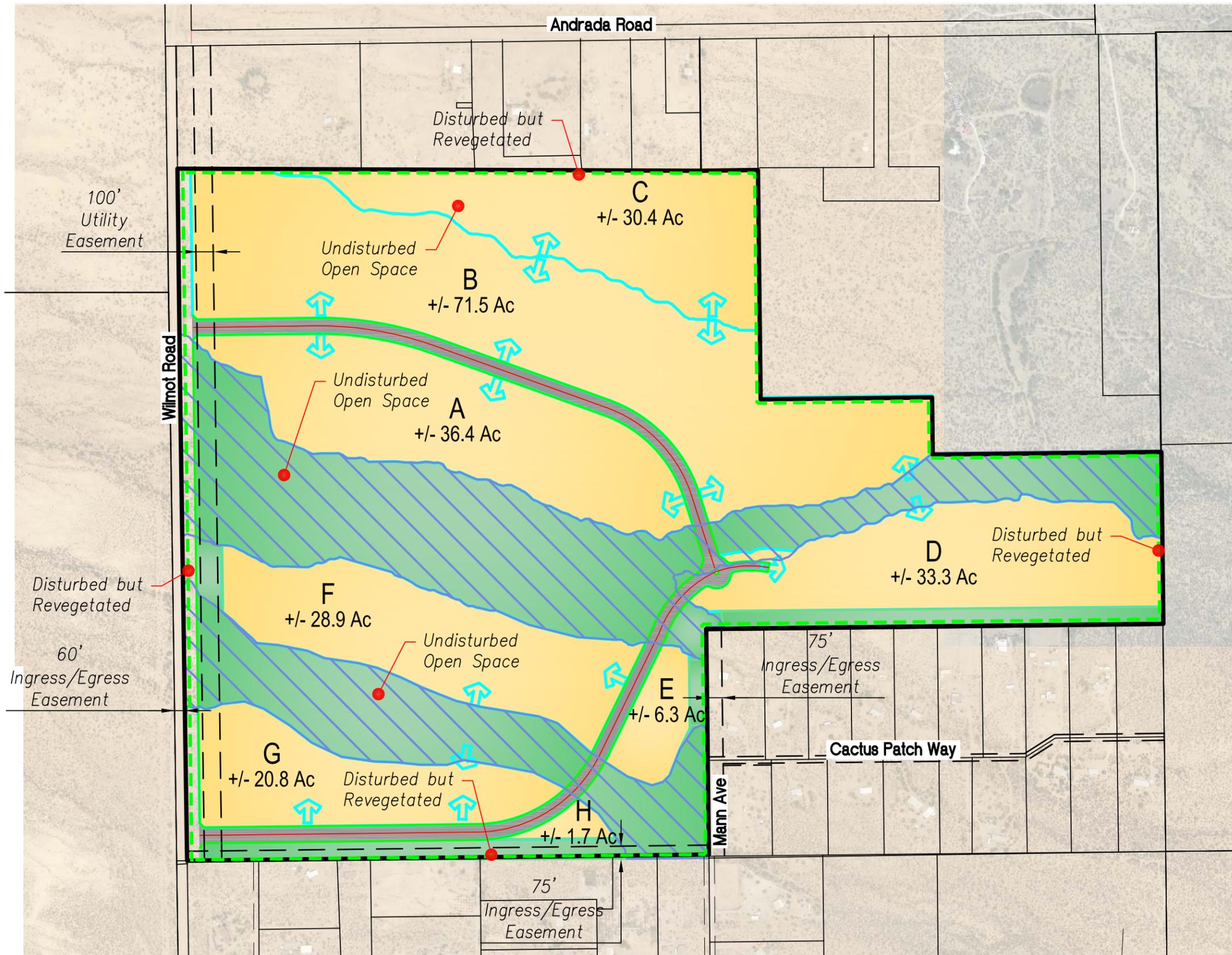
While the buffer along the southern boundary is only required to comply with Pima County's Bufferyard C, the owner has agreed to provide a 100 foot buffer along the entire southern boundary which will be left essentially natural other than where necessary to convey surface runoff. Any disturbed areas will be revegetated. In addition, a strip of enhanced vegetation will be planted along the southern portion of the buffer which will vary from 20 to 40 feet in width. This enhanced area will include native, drought tolerant trees, cactus and shrubs and will have irrigation during a reasonable establishment period.

It is anticipated that a variety of landscape bufferyards will be used at Wilmot Park depending on location, screening needs and design development. More detail and design sections for proposed landscape bufferyards will be addressed at the initial platting stage.

Within portions of the proposed bufferyards there are several known easements. Along the west edge of the property, Wilmot Road lies within a 60 foot ingress/egress easement and adjacent to Wilmot Road, there is an existing hundred (100) foot utility easement. Along the southern boundary there is also a seventy-five foot ingress/egress easement, however it does not appear as though it ever has been used. These easements identified on FIGURE X – Landscape and Buffer Plan.

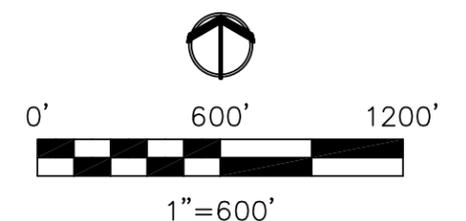
It is the intent that areas of high vegetative value will remain undisturbed, with 30% being set-aside to meet the requirements of the Native Plant Preservation Ordinance (NPPO). Some specimen saguaros, cacti and trees in good health may be transplanted into bufferyards and open space areas within the project. Locations of these transplants will be chosen based on density of existing vegetation and the need to provide additional screening and/or for visual interest and so as to minimize any disturbance to the existing vegetation.

FIGURE II-F.1 BUFFERYARDS



LEGEND

- Bufferyard "C"
- █ 100 FT Buffer



II-G. VIEWSHEDS

As shown in the Site Inventory, the areas on and off the site have very limited vegetation and therefore the primary views are long distance vistas, looking toward the Santa Rita or Catalina Mountains.

FIGURE II-G.1 shows representative views into the development from the residential properties along the north and south boundaries.

Buffers will be included on all sides of the development to minimize impacts to other properties in accordance with Pima County Bufferyard requirements (see Section II-F).

Since there are no attractive features in the foreground, views from the adjoining properties are either north or south to the mountains. Because the site is relatively flat and no significant fills are planned, views to the mountains are at an angle that will not be significantly affected by the proposed residential development.

FIGURE II-G.1 VIEWSHEDS – SITE PHOTOS



Looking into the property from the northwest corner along Wilmot Road.



Looking southwest into the site from the northwestern portion of the property.



Looking northwest into the site from the southeast corner of parcel 305-23-0260.



Looking into the property from the southwest corner of the property along Wilmot Road.

II-H. TRANSPORTATION

The Wilmot Park development has been designed such that it will have two points of access from Wilmot Road which will be located approximately one half mile apart. In addition, a future connection is shown to the BLM property to the east. The two points of access will minimize congestion and provide residents with duplicity of access options which will facilitate access either north toward Interstate 10 or south to Sahuarita Road.

As discussed previously, Pima County will be paving Wilmot Road to a two lane section starting later this year which will be completed prior to the development of Wilmot Park.

Internal roadways will provide connection to pedestrian and bike paths within the development which will offer multiple options for traveling between blocks and recreation areas. These will be designed at the time of platting of individual blocks but will likely parallel major roadways or floodplain/open space.

At this time all roadways within Wilmot Park are intended to be public but the final decision on roadway ownership will not be made until each block is lotted and platted. Per the Traffic Impact Analysis, the internal traffic generated by this project can be safely and adequately accommodated by a two lane collector. The proposed cross section is included in FIGURE II-H.1. The interior collector roadway would be widened at the Wilmot intersections to accommodate outbound dedicated right and left turn lanes. In addition, the collector may be widened to accommodate a median to create an attractive entrance to the community.

A final determination of the roadway configuration, including in-street or separate bicycle and pedestrian facilities will be made as part of the initial platting process.

The design of the subdivision shall comply with the connectivity standards outlined in the 2016 Pima County Subdivision and Development Street Standards. Because the overall development exceeds 200 homes, the standard calls for four ingress/egress connections unless the boundary contains constraints such as existing unconnected development. Such development occurs along half of the north and the entire southern boundary. Those areas constitute approximately 40% of the overall development boundary, which allows the number of ingress points to 2.4. The PDP provides for three points of access, two onto Wilmot Road and one to the east for a future connection to the BLM property.

The project has been designed to provide two points of access to Wilmot Road to minimize congestion at the entry points. In addition, each individual block will be designed to provide convenient access to the interior collector loop shown on the PDP. Bicycle and pedestrian paths will be included to provide for non-vehicular access between blocks and to recreation areas minimizing the need for internal vehicular use. The internal subdivisions will be designed so that the highest residential densities are located adjacent to Wilmot Road or the internal spine road in the event that future transit opportunities become available.

The internal circulation system shown on the PDP is conceptual. The final configuration will be determined at the time of future plat submittals subject to Street Layout and Connectivity provisions in the Pima County Subdivision Street Standards.

A full Traffic Impact Analysis has been prepared to evaluate the current and future transportation system at the proposed project site, both prior to and following the completion of the proposed project which is included in APPENDIX B. Section II-H is a summary of the key development impacts and infrastructure needs associated with the development of the property.

Site Traffic Forecasts

Trip Generation

Trip generation for the project was developed utilizing nationally agreed upon data contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 9th Edition, 2012*. ITE Land Use 210: Single-Family Detached Housing, was used to perform the trip generation analysis for the proposed 800 single family homes. Results for the expected weekday trip generation for the new project are shown in the table below.

Table 6 – WEEKDAY PROJECT SITE GENERATED TRIPS

Time Period	Proposed Single Family Detached Housing
Average Daily, Inbound (vtpd)	3,971
Average Daily, Outbound (vtpd)	3,971
Total Daily	7,941
AM Peak Hour, Inbound (vtph)	157
AM Peak Hour, Outbound (vtph)	470
Total AM Peak	626
PM Peak Hour, Inbound (vtph)	525
PM Peak Hour, Outbound (vtph)	309
Total PM Peak	834

vtpd - vehicle trips per day, vtph - vehicle trips per hour

Trip Distribution & Assignment

Trip distribution for the project was based on existing traffic patterns, roadway improvements which will be part of the project, and future roadway development in the Pima Association of Governments (PAG) Regional Transportation Plan (RTP). It is expected that a large portion of site traffic will use the Wilmot Road improvements to access I-10 to the north. However, it is likely that some traffic will travel to and from Sahuarita Road to gain access to the Nogales Highway (Business Route I-19) and Interstate-19 (I-19) west of the site.

Existing Traffic Operations

Analysis of current intersection operations was conducted for the weekday AM and PM peak hours and the level of service (LOS) was calculated for each of the project intersections. It was determined that all movements at both the Sahuarita and Andrada intersections operate at an acceptable level of service A or B. Any intersection delays would be expected to be less than fifteen seconds.

Future Traffic Operations Without Project

In order to be able to assess project impacts on future traffic operations, first Wilmot Road traffic counts were projected for 2018 and 2023 without the project. A conservative 3% annual traffic growth rate was used to determine weekday peak hour traffic volumes and level of service were calculated for each of the study intersections for 2018 and 2023 without the project.

Both of the intersections at Andrada and Sahuarita continue to operate at a level of service of A or B for 2018. In 2023, all movements are still expected to be at a level of service A or B other than the northbound movement at Wilmot/Sahuarita which would operate at level of service C.

Future Traffic Operations With Project

In order to assess the impacts of the project on future traffic operations, levels of service were calculated for each project study intersection for the years 2018 and 2023, with the project. Weekday peak hour traffic volumes without the project were combined with the estimated trips generated by the project to yield weekday peak hour traffic volumes with the project. Weekday intersection levels of service with the project were then calculated for 2018 and 2023.

In the 2018 projections, all study intersections are predicted to operate at a LOS C or better with traffic from the project. In the 2023 projections, all movements at study intersections are still expected to be at a level of service A or B other than the northbound movement at Wilmot/Sahuarita which would operate at level of service D.

Turn Lane Analysis

A key element of this study is to determine if left or right turn lanes are required at the new project site access points. Warrant criteria were based on the latest edition of the *Pima County Traffic Impact Studies/Traffic Memoranda Procedures*. The analysis indicates that southbound left turn lanes from Wilmot Road into the project site will be warranted at both the North and South Access points. In addition, exclusive left turn lanes will be required on all approaches to the Wilmot Road/Sahuarita Road intersection. An exclusive right turn will also be required on the westbound approach to the intersection of Wilmot Road/Sahuarita Road.

Conclusion

When fully completed, the proposed Wilmot Park development is predicted to generate an additional 7,941 vehicle trips per day on weekdays. All of the study intersections are predicted to operate at an adequate LOS during the peak hours of 2018 and 2023 with traffic from the Wilmot Park project.

Current projections are that Wilmot Road from Sahuarita Road to I-10 will be completely paved by summer of 2017. This improvement will provide the Wilmot Park property with improved access to I-10 to the north, and Sahuarita Road to the south, via a two-lane paved roadway. It is anticipated that the new roadway will provide sufficient capacity to accommodate the traffic generated from the site with the addition of southbound left-turn lanes at both entrances.

Following the approval of zoning, the project will submit a Block Plan or a series of individual subdivision plats for each area as they are developed. Each plat submittal will

include an update to the Traffic Impact Analysis included in APPENDIX B to address potential future variations in density and will address timing for required left-turn lane improvements on Wilmot Road.

Wilmot Park will be constructed in phases as the demand warrants. Roadway infrastructure will be constructed in phases as well as needed to provide adequate access at the time of development.

Impact Fees

This project is projected to generate significant Roadway Development Impact Fees. Any improvements constructed by the developer of the is property to any roadways that are listed in the current or future Major Streets & Routes will be eligible for rebates against these impact fees.

FIGURE II-H.1 TYPICAL ROADWAY SECTIONS

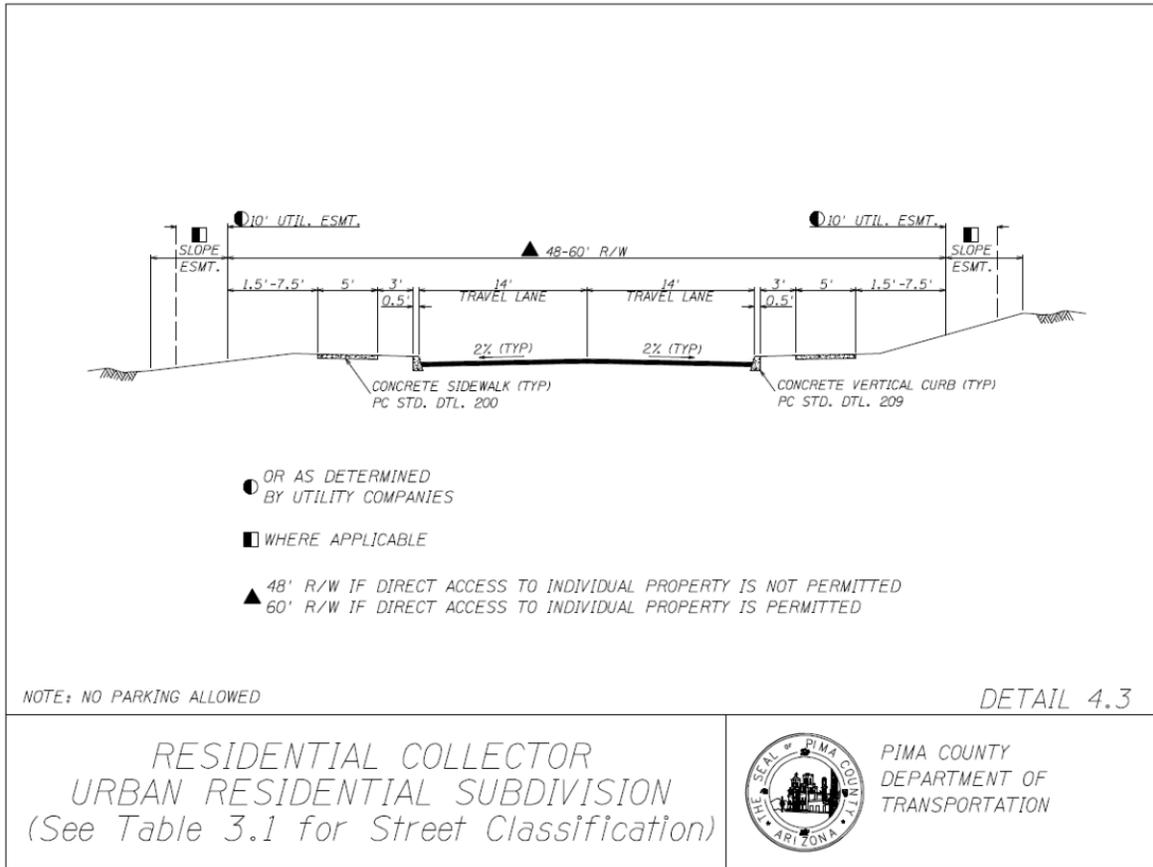
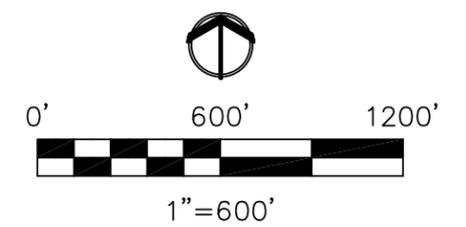
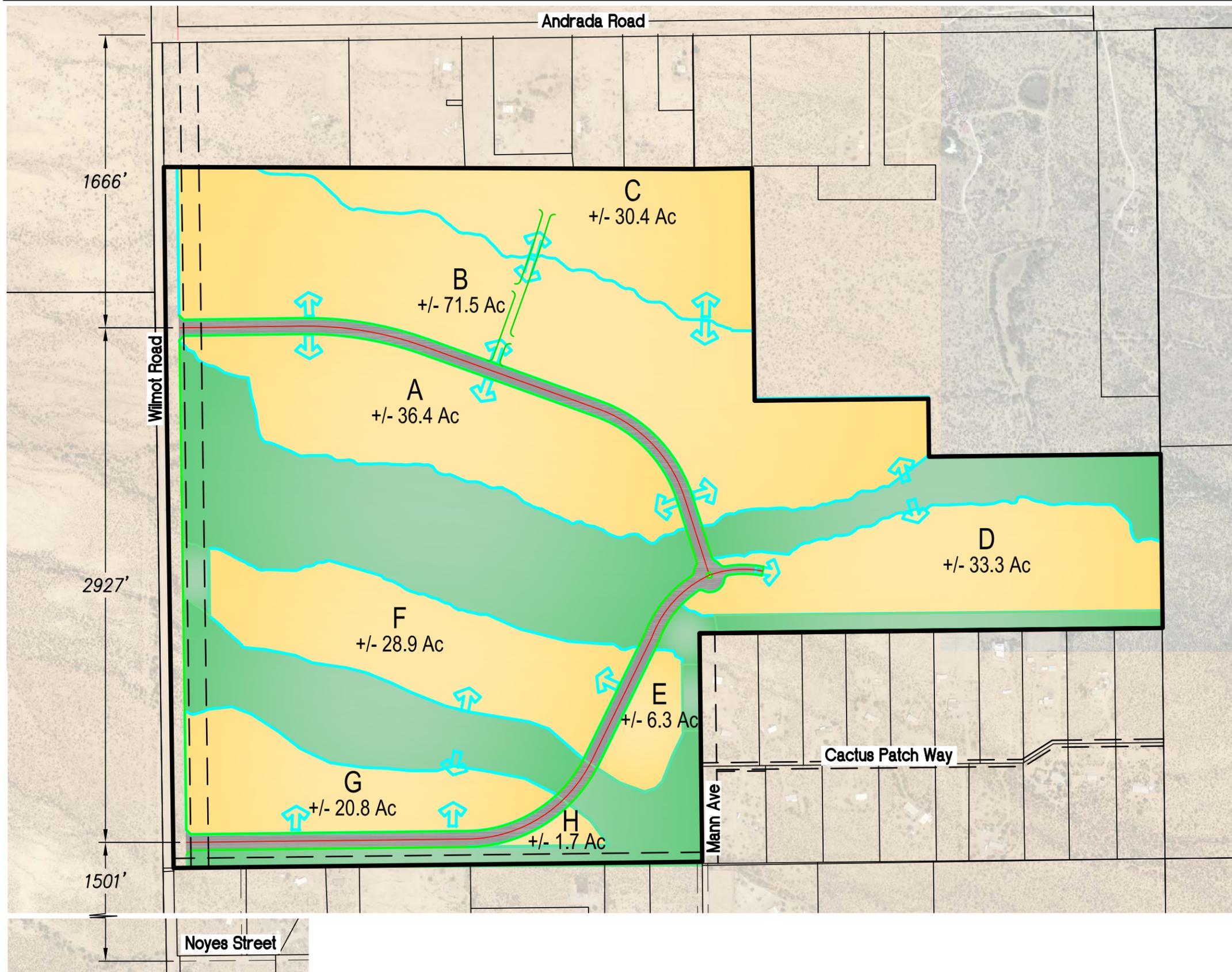


FIGURE II-H.2 INTERNAL ROADWAYS



II-I. ON-SITE WASTEWATER TREATMENT AND DISPOSAL

There will be no on-site wastewater treatment or disposal associated with this development.

II-J. SEWERS

All wastewater will be collected and transported via gravity main to a wastewater lift station located somewhere on the western portion of the property, near Wilmot Road. The wastewater will then be transported to the Corona de Tucson Wastewater Reclamation Facility by means of a sanitary sewer lift station and underground force main. Preliminary discussions with Pima County Regional Wastewater Reclamation District (PCRWRD) indicate their preference is for the facilities to be owned and operated by PCRWRD.

Preliminary analysis suggests that connection to the Corona de Tucson Wastewater Reclamation Facility will most feasible via a force main constructed along the Andrada Road right-of-way between this property and the Hook M property (Section 4,T17S, R15E), which is under the same ownership. The force main will then run through the proposed Hook M Development to the County's Corona de Tucson facility which is located adjacent to Hook M at its southeast corner.

Discussions with PCRWRD staff have indicated once the force main enters the Corona de Tucson property the sewer line can be located inside of and along the north boundary line of the County parcel.

It is understood that right-of-way for the proposed force main does not exist along the entire proposed alignment. As site development continues and more detailed engineering studies are completed, it may be necessary to locate the force main along a different route. Regardless of final route, acquisition of right-of-way for the force main will take place following the approval of rezoning but prior to approval of the initial plat. All costs for the acquisition of this right-of-way as well as the cost of the construction will be borne by the developer.

We have met with representatives of PCRWRD and they have indicated their conceptual concurrence with this concept. They have stated that there currently is excess physical capacity at the Corona de Tucson facility which has previously been committed to other developments.

A benefit of the development being served by the Corona de Tucson facility is that the facility recharges treated effluent and therefore there will be local recharge to counterbalance the water withdrawn to serve this project.

A capacity response letter has been requested and is included in FIGURE II-J.1.

FIGURE II-J.1 CAPACITY RESPONSE LETTER



JACKSON JENKINS
DIRECTOR

PH: (520) 724-6500
FAX: (520) 724-9635

June 21, 2016

William B. Carroll, P.E.
Engineering & Environmental Consultants
4625 E Ft Lowell Rd
Tucson, Arizona 85712

Sewerage Capacity Investigation No. 2016-153 Type I

**RE: Wilmot 360, Parcels 30523018A, 30523018C, 305230260, 30523027B
Estimated Flow 129,600 gpd (ADWF).
P16WC00155**

Greetings:

Capacity is currently not available for this project in the public sewer conveyance system or in the treatment facility.

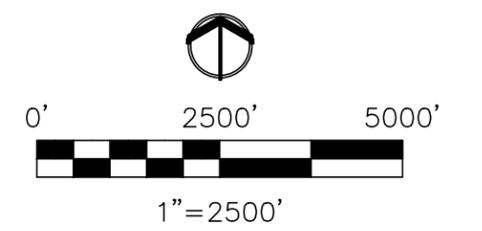
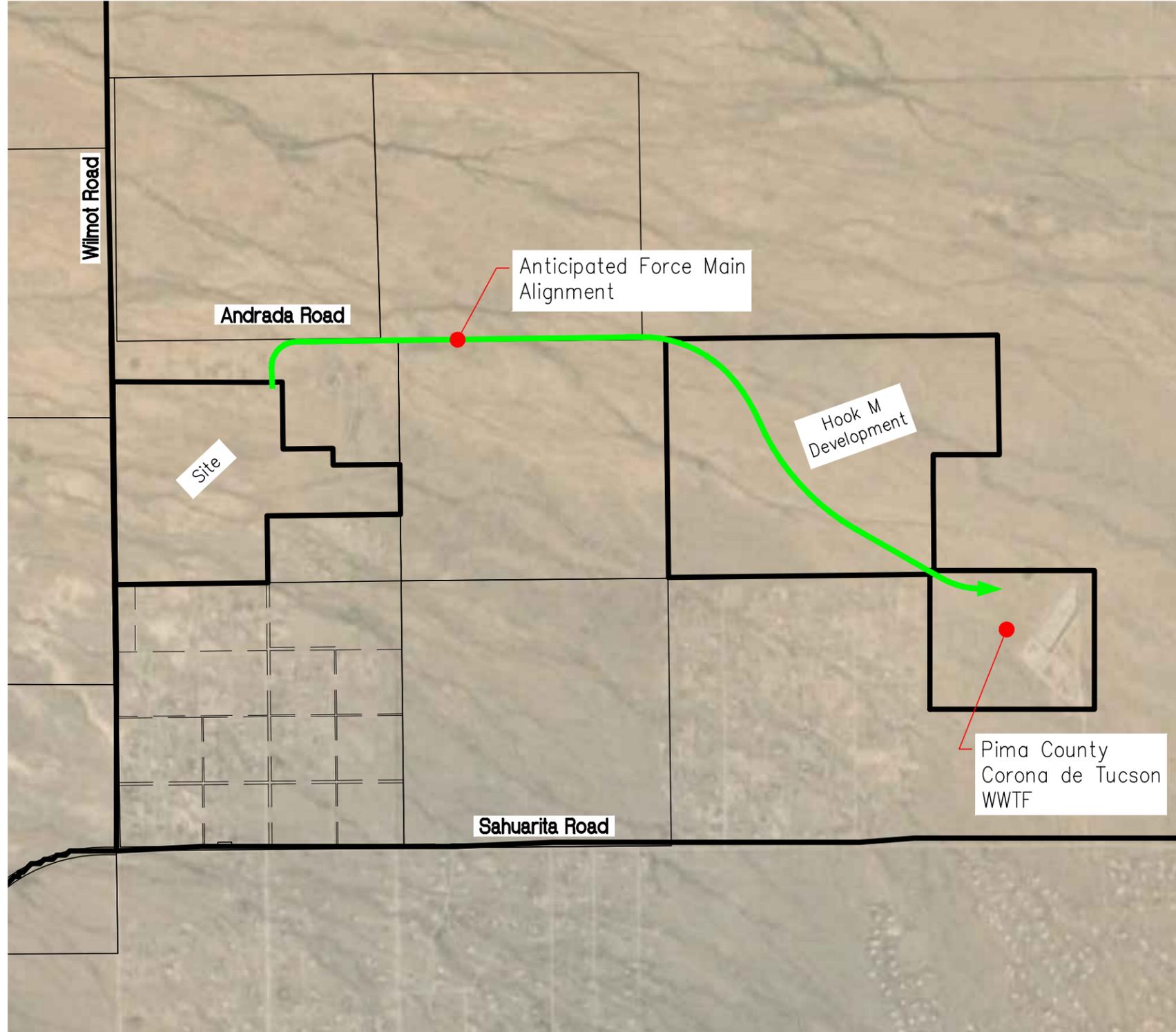
The Pima County Wastewater Reclamation Department (PCWRD) is the Designated Management Agency for this service area. The above referenced project is planned to be tributary to the Corona De Tucson Water Reclamation Facility. PCWRD will provide conveyance and treatment service to this project based on the subject zoning of the parcels. This does not guarantee that conveyance or treatment capacity for this project is currently available. The developer's responsibility will be to enhance or modify the existing system to meet that demand, including the design and construction of any pump stations, force mains and/or delivery lines from the property to the treatment facilities, as well as any necessary improvements to those facilities.

The owner/developer will negotiate a Master Sewer Service Agreement with PCWRD, prior to recordation of the master block plat for the subject property, which shall specifically identify the design, bid, construction, acceptance, administration, operation and maintenance requirements for the wastewater improvements to serve that property.

If further information is needed, please feel free to contact us at (520) 724-6642.

Reviewed by: Kurt Stemm, CEA Sr.

FIGURE II-J.2 WASTEWATER CONNECTION



II-K. WATER

The city limit is located approximately 700 feet north of the Wilmot Park northerly property line. However, this property falls outside the Tucson City Limits and is located in an area that Tucson Water Department has designated as a Non-Expansion Area. Consequently Tucson Water will not serve this property.

Water for the Wilmot Park property will be provided by Red Rock Utilities. The property does not currently lie within the utility company's Certificate of Convenience and Necessity (CCN). However the utility company has agreed to provide water to the property upon receipt of a new CCN authorizing the expansion of its water service area by the Arizona Corporation Commission. A copy of the letter from Red Rock Utilities agreeing to provide service is included in FIGURE II-K.1

A Preliminary Integrated Water Management Plan has been prepared and is included as APPENDIX D.

FIGURE II-K.1 RED ROCK UTILITIES



May 29, 2016

Robert Tucker
Andrada Wilmot 180, LLC
2200 E. River Road, Suite 115
Tucson, Az 85718

Re: Will Serve Notification – Water Service for Parcel Numbers 305-23-018A, 305-23-018C, 305-23-027B & 305-23-0260

Dear Mr. Tucker:

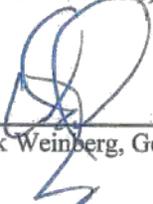
Red Rock Utilities, LLC (hereinafter referred to as “the Utility”), has received and reviewed your request for water service, and has determined that the subject property is not located within the boundaries of the current Certificate of Convenience and Necessity of the Utility as defined by the Arizona Corporation Commission (“ACC”). However, the Utility will provide service to the property subject to obtaining a new Certificate of Convenience and Necessity for the property from the ACC authorizing an expansion of its water service area to allow the provision of potable water service to future customers on your parcel.

The landowner will be subject to the regulations, statutes, orders and/or directives from any entity with regulatory/statutory authority over the Utility and the conditions under which it may provide service to the subject property.

We look forward to working with you in the development and implementation of your property.

Sincerely,

Red Rock Utilities, LLC



Mark Weinberg, General Manager

2200 East River Road, Suite 115, Tucson, Arizona 85718-6586
520.577.0200 phone 520.299.5602 fax

II-L. SCHOOLS

The Wilmot Andrada property lies within the Vail School District. Students living in this development would go to Sycamore Elementary and Corona Foothills Middle School which are located in the Santa Rita area, south of Sahuarita Road. They are less than five miles from this property and high school students for this property may attend Cienega, Empire, Andrada or Vail High School, which is a charter school. Construction is currently underway for Copper Ridge Elementary which will open in fall of 2016.

Projected Increase to Enrollment

Table 7 shows the projected increase in enrollment to the Vail School District based on the proposed development. Table 8 shows the current capacity and enrollment numbers for each area school as provided to us by District staff. Table 9 provides an analysis of the impact of the development on the area schools and their ability to absorb the new students.

Table 7: PROJECTED INCREASE IN ENROLLMENT

School Level	Number of Units	Vail School District Multiplier	Projected Number of Students
Elementary	800	.25	200
Middle School	800	.17	136
High School	800	.21	168

Table 8: CURRENT SCHOOL CAPACITY AND ENROLLMENT

School	School Capacity	Current Enrollment
Sycamore & Copper Ridge Elementary	1150 *	959
Corona Foothills Middle School	650 *	465
Cienega, Empire and Andrada High Schools	2,875	3,401

* Sycamore & Corona share facilities on a joint campus & therefore have a combined capacity of 1,250.

Table 9: ANALYSIS OF UNDER/OVER PERCENTAGE

School	Wilmot/ Andrada Students	Current Enrollment	Projected Number of Students	Capacity	Under/ Over Percentage
Sycamore & Copper Ridge Elementary	200	959	1159	1150	101%
Corona Foothills Middle School	136	465	601	650	92%
Area High Schools	168	3,401	3,569	2,875	124%

The analysis above indicates that addition of students at the elementary and middle school level would not overtax the current facilities. It shows that area high schools would be over capacity but this excludes Vail Academy Charter High School which currently has approximately 150 students and presumably additional capacity. A school site of approximately fifteen acres has also been committed as part of the nearby Hook M Ranch project which has not yet started construction.

School District Agreement

An agreement has been reached between Vail Unified School District and the Wilmot Park owner to assist the District with a per lot Education Fee. A copy of that agreement is included on FIGURE II-L.1.

FIGURE II-L.1 VUSD AGREEMENT**AGREEMENT**

This Agreement (the "Agreement") by and between the Vail School District (the "District") and Andrada Wilmot 180, LLC (the "Developer"), its successors, assigns and/or optionees for the project known as Andrada 365 (the "Project") which is being planned for approximately 800 single-family residential units, hereby set forth the following:

In consideration of the potential impact of the Project on the resources of the Vail School District, the parties have agreed to the following:

- High quality schools are in the best interest of the Vail School District, present and future residents of the District and Andrada Wilmot 180, LLC.
- As the Developer of Andrada 365, you will fulfill your responsibility by agreeing to contribute an "Education Fee" of One Thousand, Three Hundred and Fifty Dollars (\$1,350.00) for each residential lot in Andrada 365, if the platting and rezoning are approved as presented to the Pima County.
- The Education Fee will be paid at closing of the sale of each house and shall be from Seller's proceeds at closing and shall not be shown as a charge against Buyer on the closing statement for any house.
- The obligation to pay the Education Fee shall terminate if at any time a mandatory school impact fee in an amount equal to or greater than the Education Fee is imposed by the State of Arizona or any of its political subdivisions on residential development within the project. If a mandatory school impact fee in an amount less than the Education Fee becomes legally binding on the residential development within the project, the Education Fee shall be reduced by the difference between the mandatory school impact fee and the Education Fee.
- Upon the payment of the One Thousand, Three Hundred and Fifty Dollar (\$1,350.00) Education Fee with respect to any residential lot, that lot shall be automatically released from the terms of this agreement

Sincerely,

VAIL SCHOOL DISTRICT


Calvin Baker
Superintendent

II-M. RECREATION AND TRAILS

Proposed Recreation Areas

Recreation areas within the Wilmot Park development will comply with Pima County Code of Ordinances Chapter 18.69.90 and the Recreation Design Manual. At a minimum, recreation area will be provided at the rate of 871 square feet per residential lot. Based on a maximum yield of 800 units, that would equate to roughly 16 acres of recreation area for the development. It is the intent of the developer to incorporate recreational open space in close proximity to all residents. Passive and active recreation areas will be provided throughout the development and will be linked through a system of trails, paths and sidewalks. At this stage in the entitlement process, locations for recreation areas and specific programmed amenity elements have not been designed. Recreation open space programming will be finalized and submitted at the time of the initial platting efforts, with a Recreation Area Plan (RAP) being provided at the initial platting stage.

Proposed Recreation Area Ownership

Open space (recreation areas, natural open space, and landscape bufferyards) provided within the Wilmot Park development will be owned and maintained by either the Wilmot Park Master Homeowners Association (HOA) or in some cases by individual HOA's within a residential subdivision / block. It is anticipated that any parks within the development will be privately owned.

Proposed Trails

The Wilmot Park development will include internal non-vehicular circulation systems in the form of bicycle paths, pedestrian trails and sidewalks. Pathways and sidewalks will be a hard surface such as asphalt or concrete, while trails will typically be natural surfaces such as crushed granite, compacted earth or other dustproof surface. The trail and pathway system will encourage interaction between the development's residents and the preserved riparian and recreation open space areas, as well as provide connections to the adjacent planned future greenways and bicycle routes.

Per the Pima County Trail System Master Plan, within a one mile radius of the Wilmot Park project site there are three (3) planned future greenways. Wilmot Road Greenway, a north/south greenway, is proposed along the western boundary of the project site which then connects to two (2) east/west greenways, Southlands Greenway to the north at Andrada Road and Sahuarita Greenway to the south along Sahuarita Road. As part of this rezoning, a commitment has been made to construct a portion (approximately 4,000 linear feet) of the Wilmot Road Greenway that is proposed adjacent to the project's western boundary.

Exact locations and design sections of the path and trail system will be provided to Pima County for review along with the submittal of the initial plat for the development.

II-N. CULTURAL RESOURCES: ARCHAEOLOGICAL AND HISTORIC SITES

Two separate cultural resource reports have previously been prepared which cover the entirety of the property. The first report was prepared by P.A.S.T. in 2013. The report covers parcels 305-23-018A, 305-23-018C and 305-23-027B. The second report was prepared by Statistical Research, Inc. in 2015. This report covers parcel 305-23-0260. As stated previously, there is no indication that any significant site disturbance since has occurred since the date of those reports.

The reports show two areas that had sufficient surface indications of archaeological materials on the property to meet the Arizona State Museum minimum standard for recording as an archaeological site. Neither of the reports recommends a need for further study.

Prior to the approval of the initial subdivision plat, a new cultural resources study will be prepared and submitted to Pima County that will address the current situation and recommend if any additional study is needed.

II-O. ENVIRONMENTAL QUALITY

Control of Dust

During construction the project will have water trucks actively working the site to keep dust down. Following completion of construction, all internal circulation and parking areas will be hard surfaced to mitigate airborne dust.

Control of Emissions Greater than 100 Tons per Year

This property is to be zoned for residential uses and these criteria do not apply.

II-P. AGREEMENTS

There are no other agreements that have been made between the current owner and other parties other than those addressed in this document.

**APPENDIX A:
BIOLOGICAL STUDIES**



GRS

LANDSCAPE ARCHITECTS, LLC.

11047 N. Cloud View Place, TUCSON AZ 85737

Office (520) 877-8037

gregs@grslandscapearchitects.com

August 6, 2013

Robert Tucker
Diamond Ventures
2200 E. River Rd. Suite 115
Tucson, AZ 85718

RE: Andrada Property

Dear Robert,

Between July 25 and August 2, GRS Landscape Architects, LLC performed an onsite inspection of the above referenced property. This property is generally located southeast of the intersection of Wilmot Rd. and Andrada Rd. It is comprised of parcel #'s 30523018A & B and parcel 30523027B. The primary purpose of the inspection was to search for Pima Pineapple Cactus (*Coryphantha scheeri* var. *robustispina*). The secondary purpose of the inspection was to identify any vegetative issues that might affect the developability of parcel.

The vegetation on the property shows significant negative impact from grazing. This has resulted in destruction of much of the understory vegetation and an increase in the Cholla cactus (*Opuntia* spp) population.

The US Fish and Wildlife protocol for Pima Pineapple Cactus surveys was not followed due to budget and time constraints. Instead, two persons searched the site for Pima Pineapple Cactus concentrating on those areas where the soil and vegetation appear conducive to PPC habitat. Where PPC were found (either alive or dead), more intensive searches were conducted in the general vicinity and within the similar soil and vegetative zones.

A total of two live PPC's were found on the site and 3 remnants of dead PPC were found. Two of the dead PPC's were no longer attached to the ground, so their location may not be indicative of the plant's actual location. The two live PPC are shown on the attached "Pima Pineapple Cactus Inventory". Their location suggests a preference for the large mostly barren areas found within the northwest portion of the property. The areas with similar vegetation and soils to the PPC locations have also been shown on the Inventory Map.

The two PPC specimens found are in good condition and quite large. The good health of these plants suggests that other specimens probably exist on the property. While additional plants were not found I would anticipate a population of 5-10 plants over the property. These can most likely be located using the US Fish and Wildlife protocol for 100% coverage.

During our inspection, we did not see any other vegetation issues on the property. Much of the vegetation, particularly towards the western boundary is in poor condition and should not present any impediments to development. There is evidence of significant sheet flow over much of the property. There are also several deep cut channels, mostly along the southern boundary of the eastern portion of the site. This could provide a challenge depending on the anticipated development density. With the exception of the very southwestern corner of the site (which is classified as important riparian area) there are no CLS designations on the property.

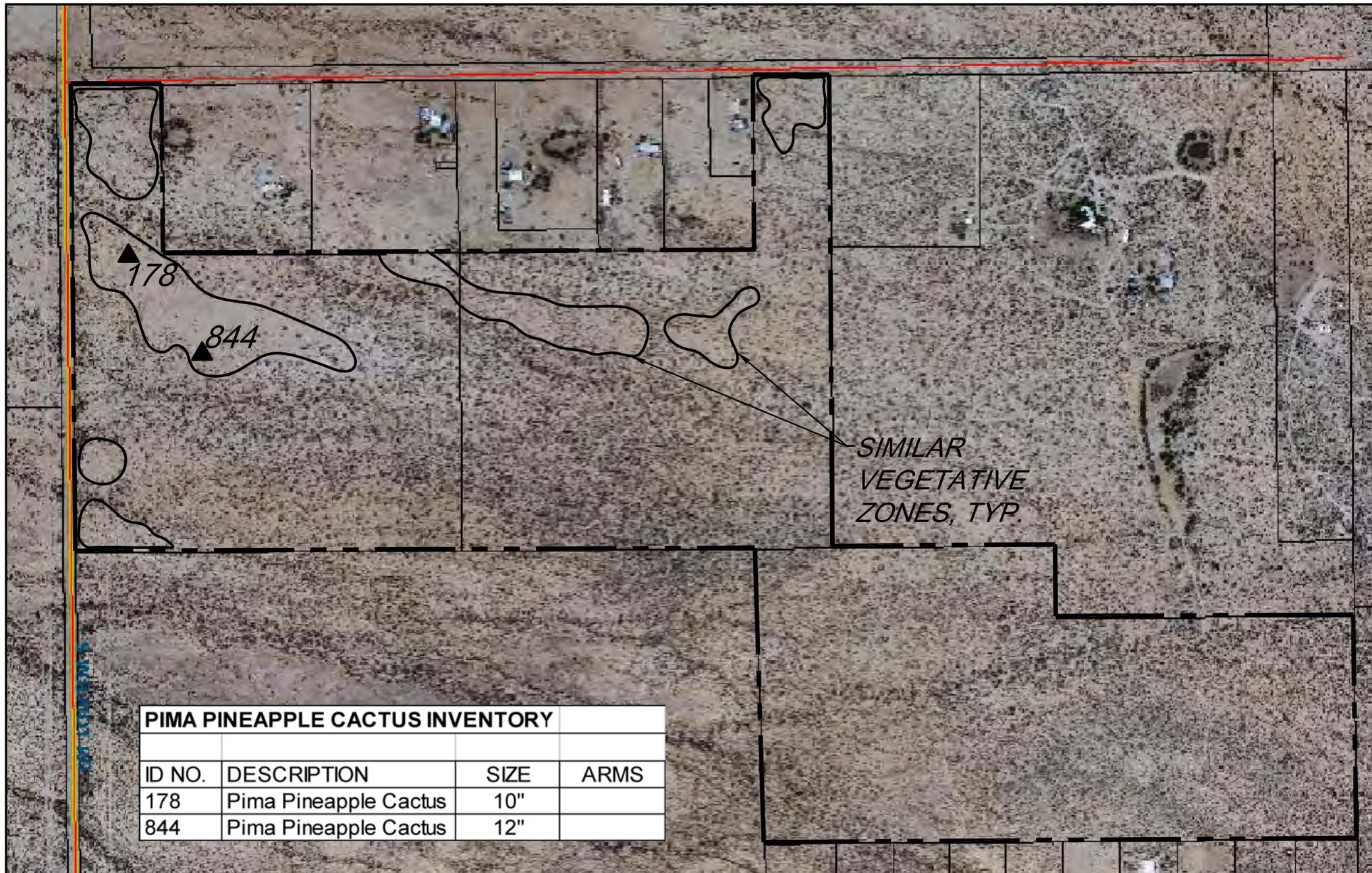
While not a part of our scope, we did locate the saguaros on the property, which will be required for a future rezoning. A Saguaro Cactus Inventory map showing their locations and sizes has been included as general information.

Should you have any questions, please feel free to call or email me.

Respectfully,
GRS LANDSCAPE ARCHITECTS, LLC.

A handwritten signature in black ink, appearing to read "Gregory R. Shinn". The signature is fluid and cursive, with a long horizontal stroke at the end.

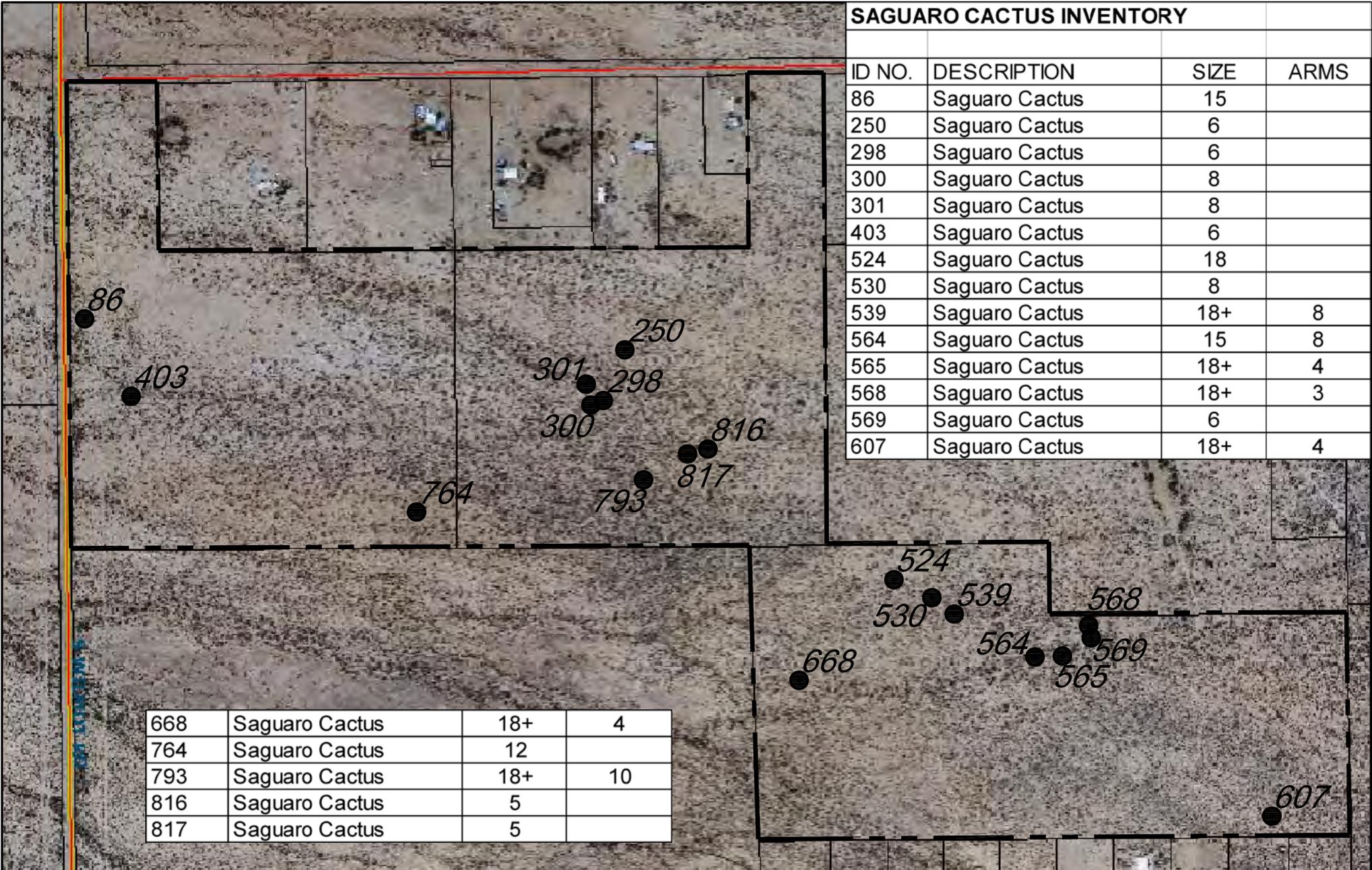
Gregory R. Shinn
Principal



11047 N. Cloud View Place
Tucson, AZ 85737
(520) 877-8037

*Andrada Road
Property*
Tucson, AZ

PIMA PINEAPPLE
CACTUS
INVENTORY



SAGUARO CACTUS INVENTORY			
ID NO.	DESCRIPTION	SIZE	ARMS
86	Saguaro Cactus	15	
250	Saguaro Cactus	6	
298	Saguaro Cactus	6	
300	Saguaro Cactus	8	
301	Saguaro Cactus	8	
403	Saguaro Cactus	6	
524	Saguaro Cactus	18	
530	Saguaro Cactus	8	
539	Saguaro Cactus	18+	8
564	Saguaro Cactus	15	8
565	Saguaro Cactus	18+	4
568	Saguaro Cactus	18+	3
569	Saguaro Cactus	6	
607	Saguaro Cactus	18+	4

668	Saguaro Cactus	18+	4
764	Saguaro Cactus	12	
793	Saguaro Cactus	18+	10
816	Saguaro Cactus	5	
817	Saguaro Cactus	5	



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Andrada Road
Property
 Tucson, AZ

SAGUARO CACTUS
 INVENTORY



PIMA PINEAPPLE CACTUS #178



PIMA PINEAPPLE CACTUS #844



PIMA PINEAPPLE CACTUS #178



PIMA PINEAPPLE CACTUS #844



11047 N. Cloud View Place
Tucson, AZ 85737
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Andrada Road
Property
Tucson, AZ

SITE PHOTOS



GRS

LANDSCAPE ARCHITECTS, LLC.

11047 N. Cloud View Place, TUCSON AZ 85737

Office (520) 877-8037

gregs@grslandscapearchitects.com

July 25, 2015

Mark Weinberg
Diamond Ventures
2200 E. River Rd. Suite 115
Tucson, AZ 85718

RE: South Andrada Property

Dear Mark,

Between June 18 and June 24, 2015, GRS Landscape Architects, LLC performed an onsite inspection of the above referenced property. This property is located approximately 2000' south of Andrada Rd. and immediately east of Wilmot Rd. The parcel number is 305230260. The primary purpose of the inspection was to search for Pima Pineapple Cactus (*Coryphantha scheeri* var. *robustispina*). The secondary purpose of the inspection was to identify any vegetative issues that might affect the developability of parcel.

The vegetation on the property shows significant negative impact from grazing, sheet flooding and erosion. This has resulted in destruction of much of the understory vegetation on the parcel.

The US Fish and Wildlife protocol for Pima Pineapple Cactus surveys was not followed due to budget and time constraints. Instead, two persons searched the site for Pima Pineapple Cactus. This search consisted of walking transects, generally east-west across the site and more concentrated searches in areas likely to contain the plant. A map showing periodic GPS tracking is included as verification of the areas searched. Note that only 1 person on the team was tracked, so search density is double that shown.

No live PPC were found on the property, however remnants of 1 dead PPC was found. The remnant was not attached to the ground, apparently dislodged by flooding. While the location of this plant has been mapped, the actual location of the plant prior to flooding is not known.

While no live specimens were found, there is probability that some individual plants do exist on the property. This is due to the presence of potential habitat (slopes, soils and vegetative community conducive to their presence and know specimens within the

vicinity). On the other hand, the search was of sufficient detail to make it unlikely that a large population exists on the property.

During our inspection, we did observe some other issues for you to consider. First, the property has numerous deep-cut drainages across the property. The number and depth of these drainages suggests that the soils are soft and highly erodible. Second, much of the property appears to be subjected to sheet flow and these areas appear to contain a lot of sediment. Third, quite a bit of the property is designated as Important Riparian Area (IRA). For purposes of a rezoning, IRA is considered a Conservation Lands System (CLS) designation and carries significant development restrictions.

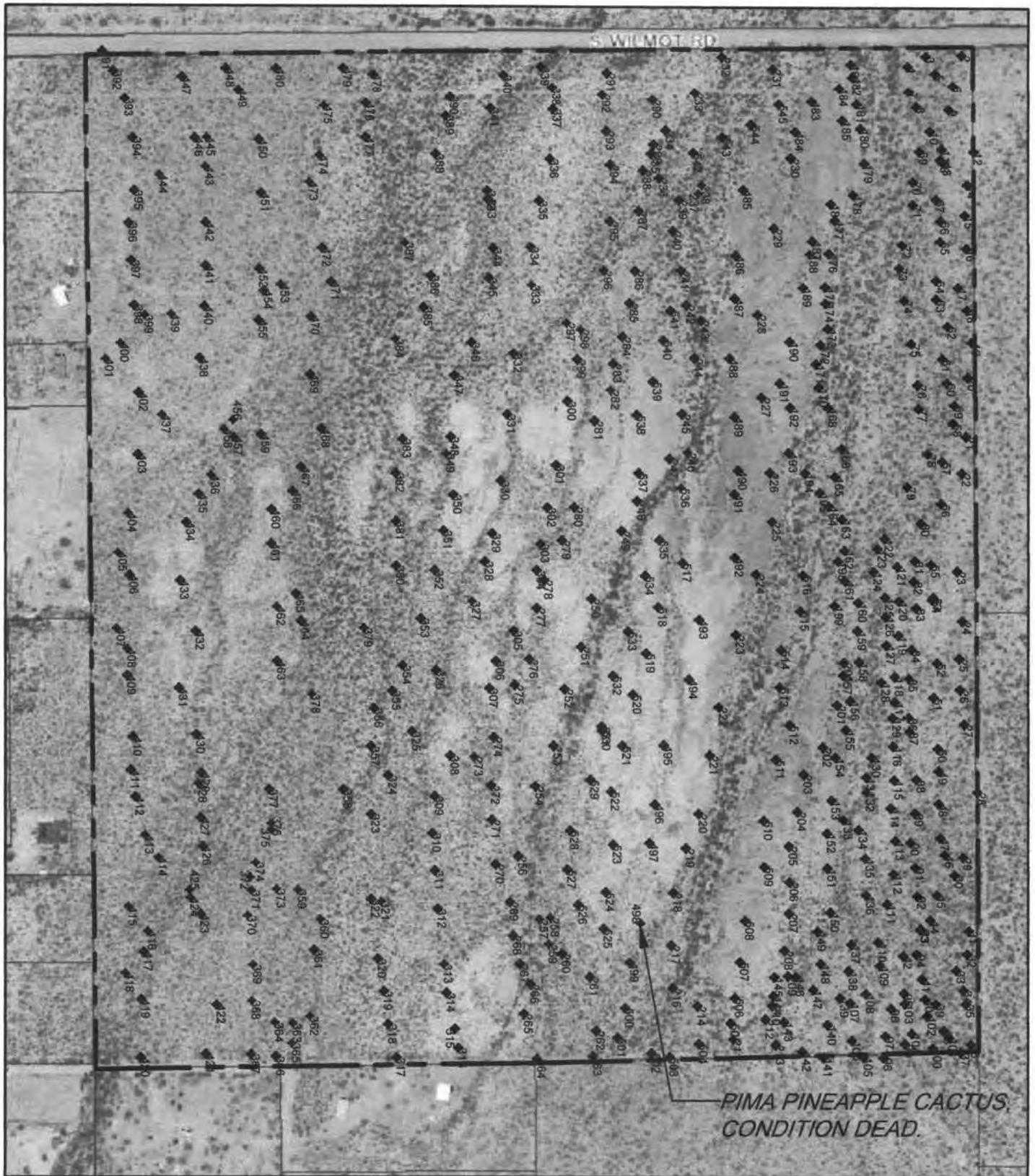
While not a part of our scope, we did locate the saguaros on the property, which is information that will be required for a future rezoning. A Saguaro Cactus Inventory map showing their locations and sizes has been included as general information.

Should you have any questions, please feel free to call or email me.

Respectfully,
GRS LANDSCAPE ARCHITECTS, LLC.

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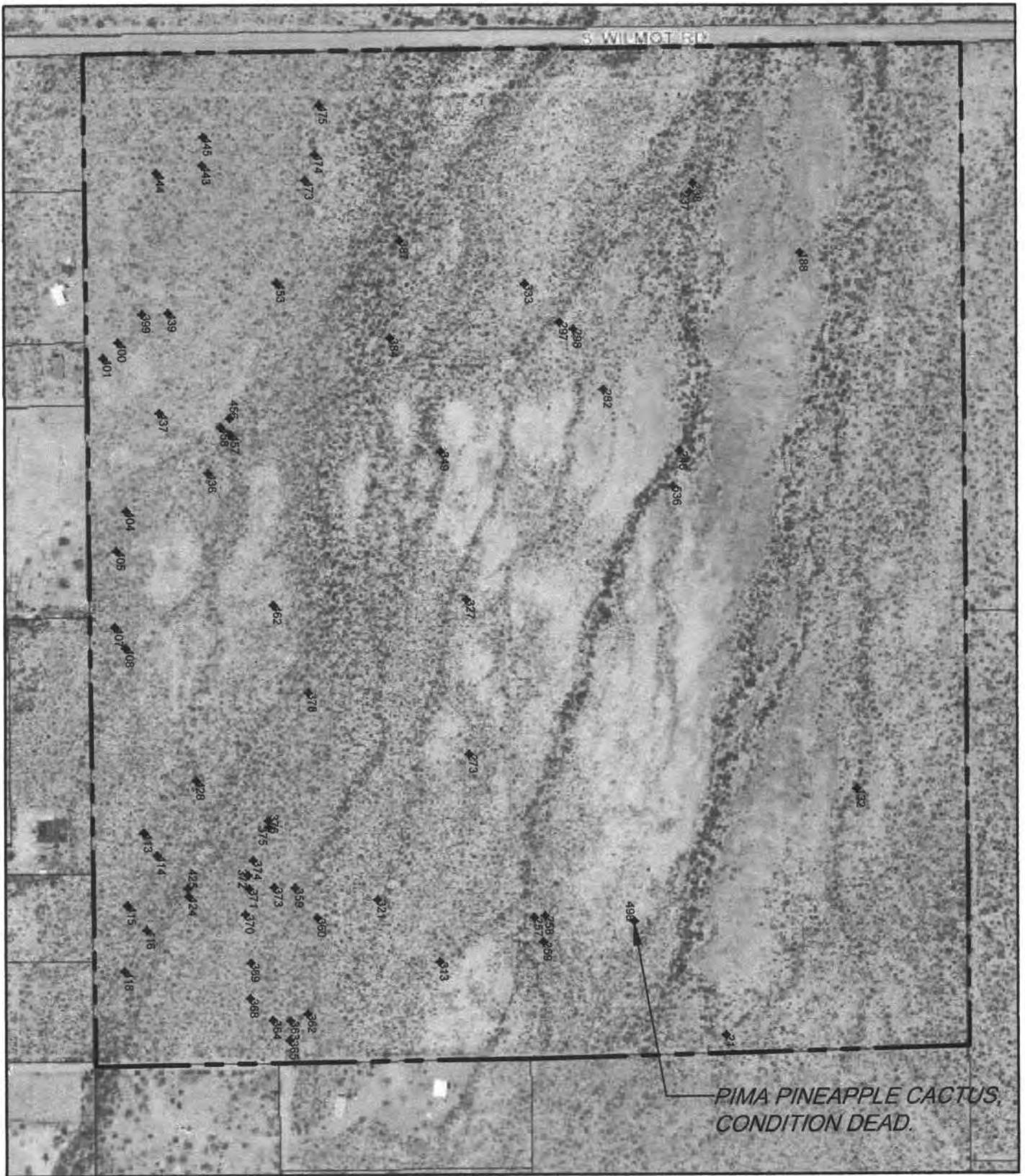
Gregory R. Shinn
Principal



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SOUTH ANDRADA

GPS TRACKING POINTS



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SOUTH ANDRADA

SAGUARO & PPC INVENTORY

**APPENDIX B:
TRAFFIC IMPACT STUDY**



TRAFFIC IMPACT ANALYSIS

WILMOT PARK ANDRADA ROAD/WILMOT ROAD

REVISED 22 AUGUST 2016
29 JUNE 2016



Expires 3-31-19

PREPARED FOR
ENGINEERING AND ENVIRONMENTAL CONSULTANTS, INC.
4625 EAST FORT LOWELL ROAD
TUCSON, ARIZONA 85712

SOUTHWEST TRAFFIC ENGINEERING, LLC
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Traffic Counts
Trip Generation Calculations
Capacity Calculations
Turn Lane Analysis
Crash Analysis
Comment Resolution

Prepared By

Andrew Smigielski, PE, PTOE
Matthew Reeg, EIT



TRAFFIC IMPACT ANALYSIS WILMOT PARK ANDRADA ROAD/WILMOT ROAD

Executive Summary

The purpose of this traffic study is to evaluate the current and future transportation system at the proposed Wilmot Park project site without and with the proposed project. Along with the site access points, traffic operations were analyzed at Andrada Road/Wilmot Road and Sahuarita Road/Wilmot Road.

Existing and Future Traffic Data Without Project

In order to document current traffic volumes, weekday peak hour turning movement traffic counts were taken at the existing study intersections of Andrada Road/Wilmot Road and Sahuarita Road/Wilmot Road.

Andrada Road/Wilmot Road and Wilmot Road/Sahuarita Road currently operate at an adequate LOS during the weekday AM and PM peak hours.

The intersection of Andrada Road/Wilmot Road is predicted to continue to operate at an adequate LOS during the weekday AM and PM peak hours of 2018 and 2023 without traffic from the project.

The northbound approach at the Wilmot Road/Sahuarita Road intersection is expected to operate at an inadequate LOS during the PM peak hour in 2023 without the project. This delay is caused by a lack of roadway capacity that limits gaps on Sahuarita Road due to the large through volumes.

The remaining movements at Wilmot Road/Sahuarita Road are expected to perform at an adequate LOS during the AM and PM peak hours in 2018 and 2023 without the project.

Future Traffic Data With Project

The intersection of Andrada Road/Wilmot Road is expected to continue to operate at an adequate LOS for the weekday AM and PM peak hours in 2018 and 2023 with the project.

The northbound and southbound movements at the Wilmot Road/Sahuarita Road intersection are expected to operate at an inadequate LOS during the AM and PM peak hours in 2023 without and with the project. A lack of capacity on Sahuarita Road limits the number of gaps for vehicles turning from Wilmot Road.

The remaining movements at the Wilmot Road/Sahuarita Road intersection are predicted to operate at adequate LOS during the AM and PM peak hours in 2018 and 2023 with the project.



Turn Lane Calculations

Based on the 2023 weekday peak hour traffic volumes with the project, left turn lanes from Wilmot Road into the project site will be warranted at the North and South Access points.

Eastbound and westbound left turn lanes at the intersection of Wilmot Road/Sahuarita Road are warranted without and with the project. In addition, a westbound right turn lane is warranted with the project at the intersection of Wilmot Road/Sahuarita Road.

Crash Analysis

Available crash history for the Wilmot Road/Sahuarita Road study intersection was obtained from Pima County for the latest available five year time frame. Two crashes were recorded at the intersection during this time span. Crash history was also reviewed on Wilmot Road from Andrada Road to Sahuarita Road for the same five year period. A total of three crashes were reported over the five year study period.

A safety analysis was conducted on Wilmot Road between Sahuarita Road and Andrada Road based on the methods presented in the *Highway Safety Manual (HSM)*. Results of the safety evaluation show that the predicted average crash frequency in years 2018 and 2023 is between one and four crashes per year without and with traffic from the proposed site.

It is expected that the 2045 PAG projected traffic volumes on Wilmot Road include trips associated with local developments such as the Andrada Wilmot development. With this in mind, trips associated with the Andrada Wilmot development are most likely captured in the frequency calculations without project site data additions.

Mitigation

Northbound and southbound movements at the intersection of Wilmot Road/Sahuarita Road are anticipated to operate at inadequate LOS during the AM and PM peak hours in 2023 without and with the project. A lack of roadway capacity that limits gaps on Sahuarita Road due to the large through volumes results in an inadequate delay.

Mitigation measures can improve the LOS for the movements that are predicted to operate inadequately during the future horizon years. With the installation of exclusive left turn lanes on each approach to the intersection of Wilmot Road/Sahuarita Road, all of the movements at this intersection are predicted to operate at an adequate LOS D or better during the weekday peak hours of 2023.

Recommendations

Southbound left turn lanes into the project should be constructed at the intersections of North Access/Wilmot Road and South Access/Wilmot Road.

Exclusive left turn lanes should be constructed on all approaches to the Wilmot Road/Sahuarita Road intersection. An exclusive right turn should also be constructed on the westbound approach to the intersection of Wilmot Road/Sahuarita Road.



TRAFFIC IMPACT ANALYSIS WILMOT PARK ANDRADA ROAD/WILMOT ROAD

Project Description

A single family housing development is proposed on undeveloped property located southeast of the intersection of Andrada Road/Wilmot Road in Pima County, Arizona. The vicinity of the project is shown in **Figure 1**. The site is located as shown in **Figure 2**. The project will consist of 800 new single family homes when fully built-out in 2018.

Access to the project site will be from two new intersections along Wilmot Road.

The purpose of this traffic impact analysis is to:

- Evaluate the current and future operational characteristics of the adjacent roadway network surrounding the project site.
- Estimate the traffic generation associated with the project and assign that traffic to the existing roadway system.
- Analyze future traffic operations at the intersections of Andrada Road/Wilmot Road and Wilmot Road/Sahuarita Road as well as the proposed access intersections.
- Determine the need for auxiliary (left and right turn) lanes at the access intersections that will directly serve the project site.
- Perform a crash analysis to identify any specific accident trends in the study area.
- Conduct a safety analysis to predict the average crash frequency on Wilmot Road without and with the project.

The author of this report is a registered professional engineer (civil) in the State of Arizona having expertise and experience in the preparation of traffic impact analyses.

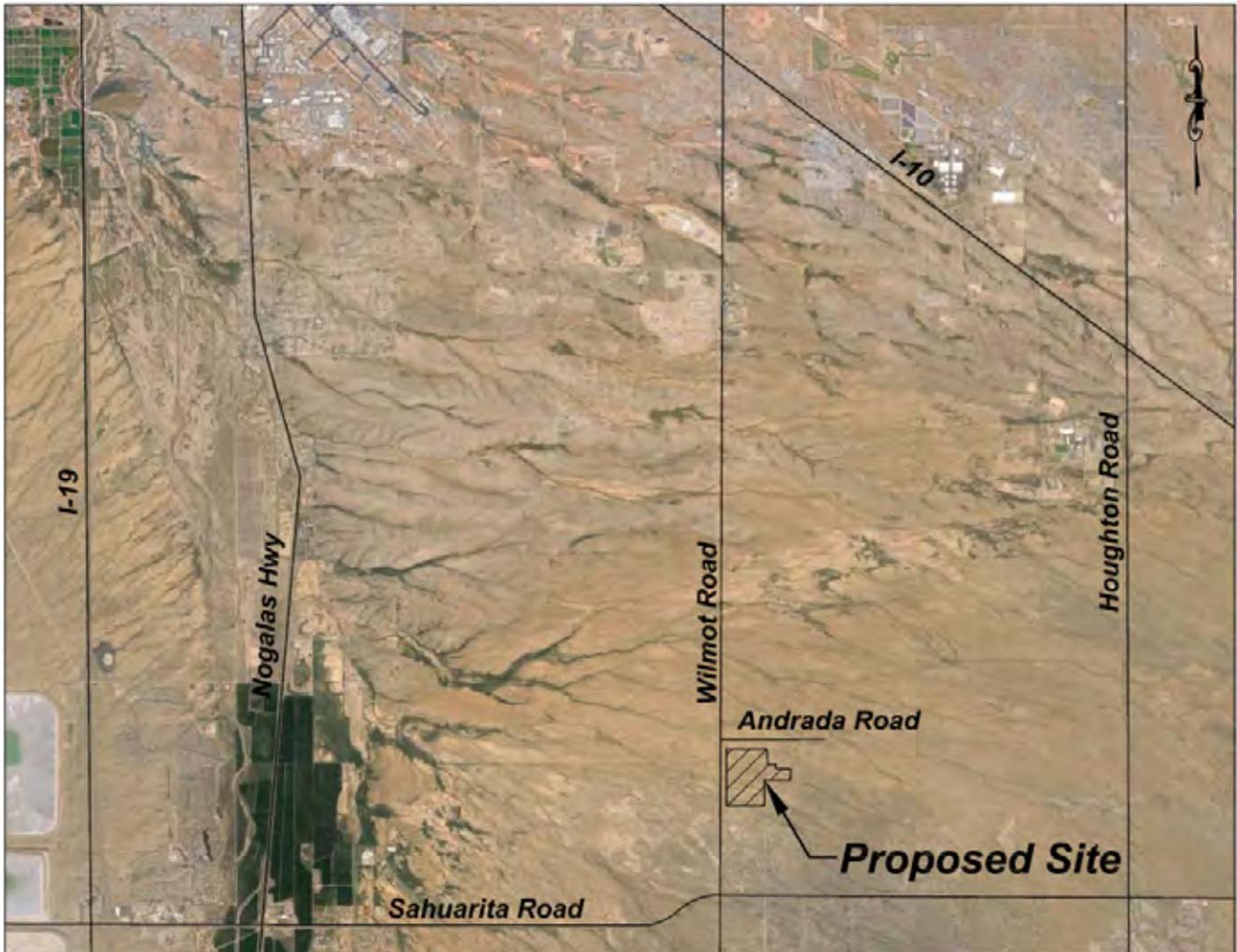
Study Methodology

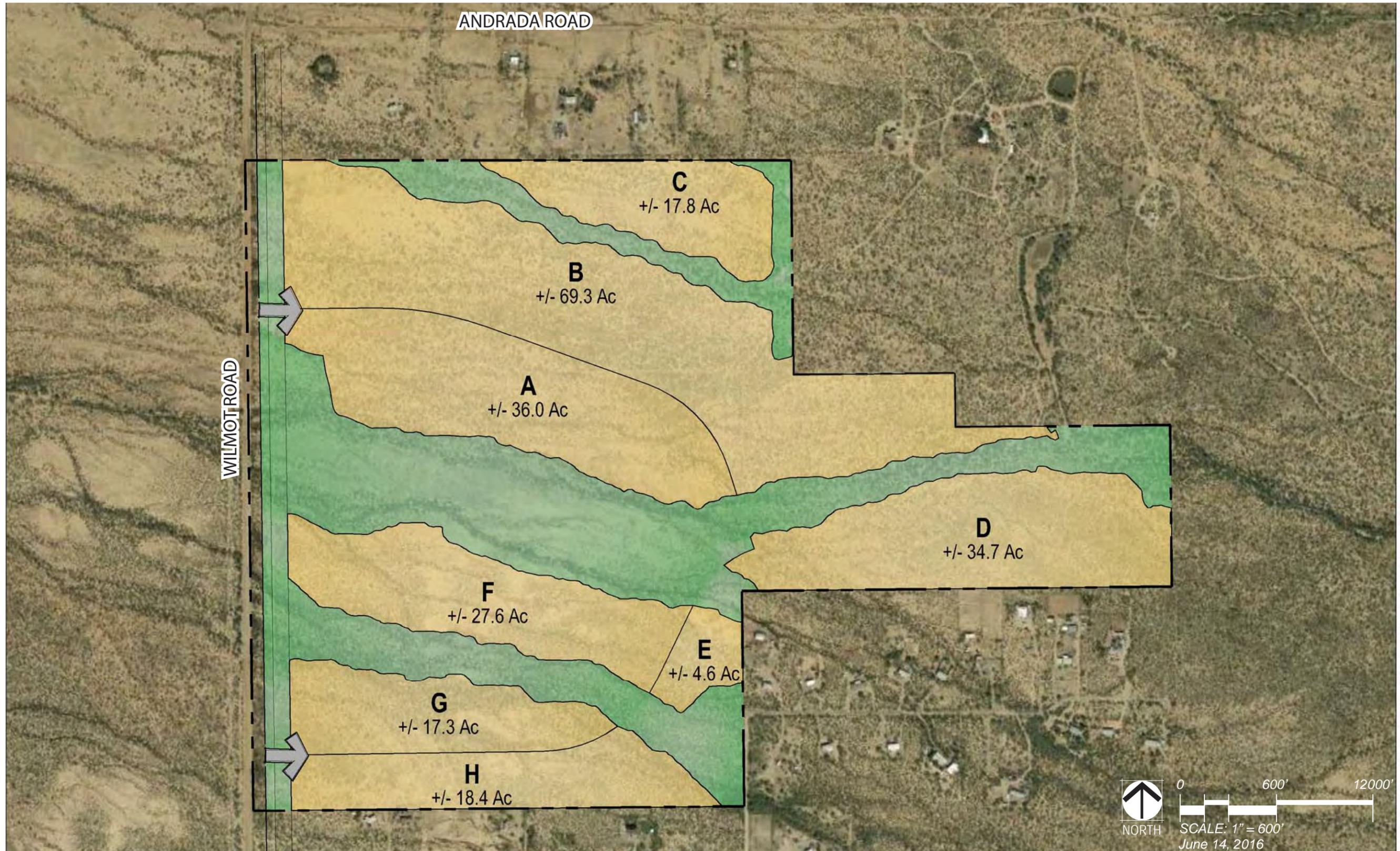
In order to analyze and evaluate the potential traffic impacts of the proposed development, the following tasks were undertaken:

- Field observation of the proposed site and surrounding area was conducted in April 2016 to evaluate the existing physical and operational characteristics of the adjacent roadway network.
- Site traffic volumes generated by the proposed site were calculated using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition, 2012*.
- Calculated site traffic was distributed based on existing traffic volumes and future roadway improvements near the proposed site, then assigned to the primary roadways within the project study limits.
- Capacity analyses were performed for the existing conditions and future conditions without and with the project based on an opening year of 2018 and year 2023. The intersections were analyzed using the methodology presented in the *2010 Highway Capacity Manual (HCM)*.



Figure 1 – Vicinity Map







- The need for auxiliary turn lanes into the site intersections was evaluated based on Pima County guidelines.
- Crash analysis was performed within the study area to determine if there are any specific accident trends.
- A safety analysis was performed based on methods from the *2010 Highway Safety Manual (HSM)*.

Existing Conditions

The study location includes the existing intersection of Andrada Road/Wilmot Road and Sahuarita Road/Wilmot Road.

Wilmot Road is a two-lane, unpaved roadway that provides one travel lane in each direction. The posted advisory speed limit on Wilmot Road in the vicinity of the site is 35 miles per hour (mph). No curb, gutter, bike lane, or lighting facilities are provided along the roadway. Overhead utility lines run along the west side of the roadway. Wilmot Road is a north/south roadway that borders the west side of the proposed site.

Andrada Road allows one travel lane in both the eastbound and westbound directions along the northern boundary of the proposed site. There is no outlet on Andrada Road east of Wilmot Road. No curb, gutter or sidewalk facilities are provided. The north side of Andrada Road is paralleled by overhead utilities.

Approximately 1.5 miles south of the site, Wilmot Road intersects with Sahuarita Road. In the area of Wilmot Road, Sahuarita Road has a posted speed limit of 50 miles per hour (MPH) and offers one lane in the eastbound and westbound directions with an eight foot paved shoulder. There is no existing curb, gutter or lighting.

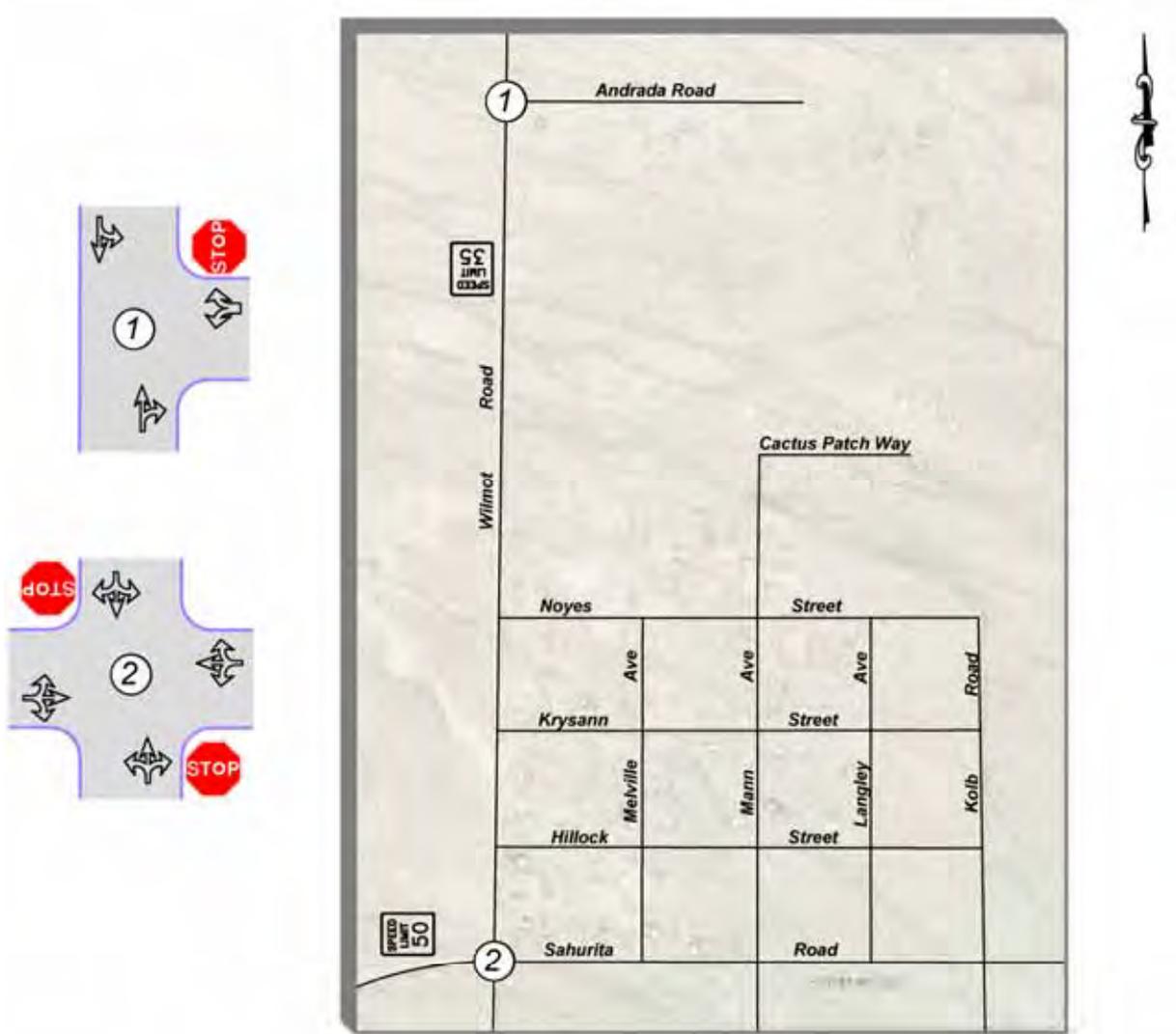
The intersection of Wilmot Road/Sahuarita Road operates under two way STOP conditions. STOP signs are present on both approaches of Wilmot Road to Sahuarita Road. The northbound and southbound approaches to the intersection maintain one lane of traffic that is permitted to make a left, through and right turn movement. The eastbound and westbound approaches offer a shared left turn/through/right turn lane and operate under a free flow condition. Roadway signing currently illustrates a ‘T’ intersection for the southbound approach on Wilmot Road at the intersection of Wilmot Road/Sahuarita Road. However, the traffic count data shows several vehicles executing a southbound through movement. In light of this, the southbound through movement was included in the analysis.

Wilmot Road/Andrada Road is a T-intersection which is STOP sign controlled for the westbound approach of the intersection. It is unpaved without turn lanes, crosswalks or pedestrian ramps. Northbound traffic can make through or right turn movements from a single lane. The southbound leg has a single, shared through/left turn lane. The only westbound lane allows a left or right turn movement.

Existing lane configurations and traffic control are shown in **Figure 3**.



Figure 3 – Existing Lane Configurations and Traffic Control



LEGEND:

 = SPEED LIMIT

 = STOP SIGN



Existing Traffic Data

In order to form a basis for analysis of the project impacts, weekday AM and PM peak hour turning movement counts were taken at the intersections of Andrada Road/Wilmot Road and Sahuarita Road/Wilmot Road.

The weekday turning movement counts were conducted from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. All traffic counts were taken in April 2016.

The existing weekday AM and PM peak hour traffic volumes are shown in **Figure 4**. The complete traffic volume can be found in the Appendix.

Access

Two new driveways on Wilmot Road will provide access to the project site.

The North Access and South Access points will be STOP controlled in the westbound direction as they approach Wilmot Road. They will provide exclusive left and right turn lanes for vehicles exiting the site. Wilmot Road will continue to be free flow and offers a shared through/turn lane at the access points.

In addition, the Pima County Department of Transportation and the Regional Transportation Authority will be paving approximately seven miles of Wilmot Road between Sahuarita Road and Interstate 10 (I-10). The completion of this project is set for the winter of 2017. At that time, Wilmot Road will be paved to allow access to I-10 approximately nine miles north of the proposed development. The cross section on Wilmot Road will include two, eleven foot lanes and six foot shoulders with clear zone slopes of 4:1 or flatter.

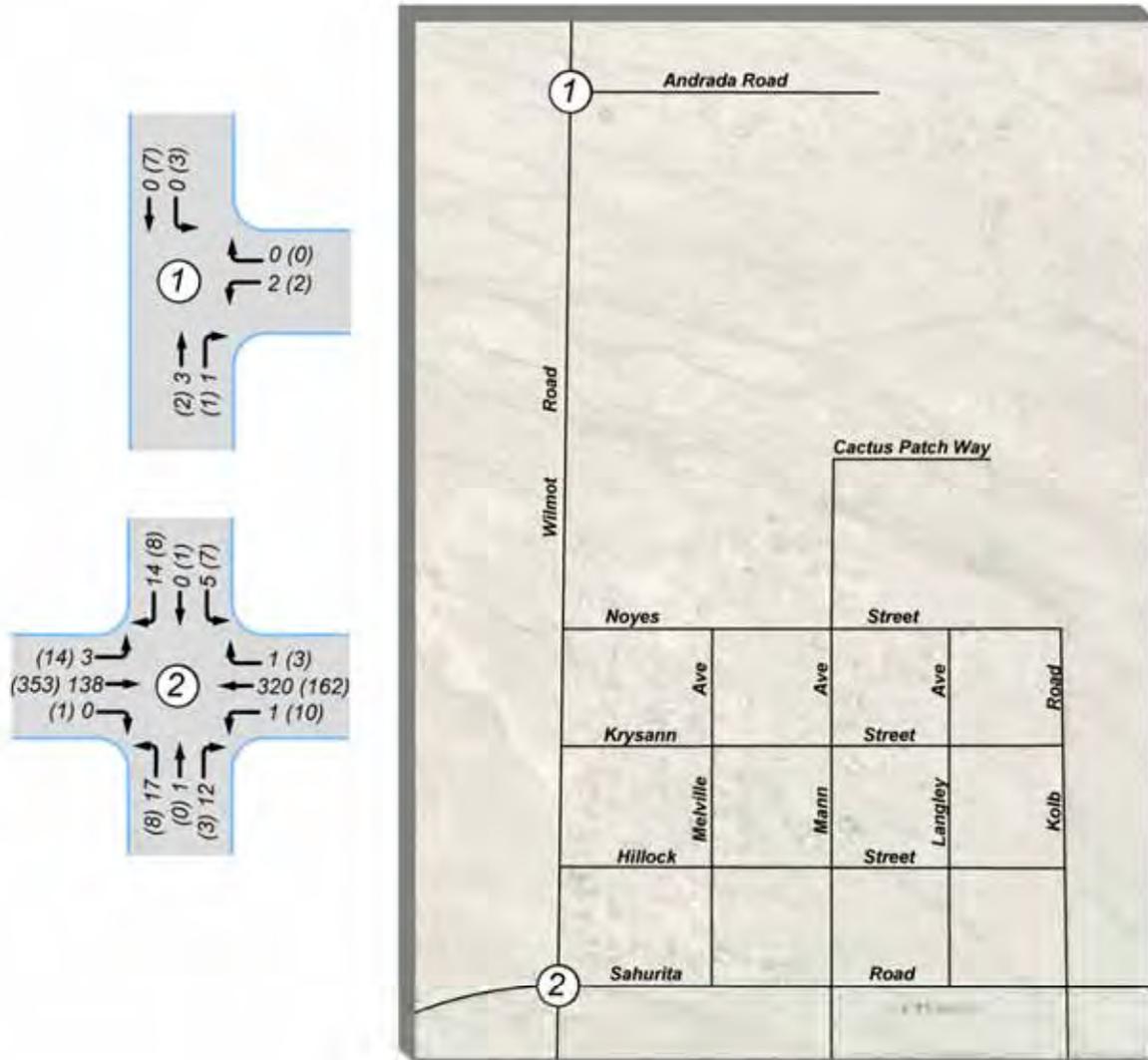
Sight distances at the future proposed access points should be verified during the design process.

Trip Generation

Trip generation for the project was developed utilizing nationally agreed upon data contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 9th Edition*, 2012. ITE Land Use 210: Single-Family Detached Housing, was used to perform the trip generation analysis for the proposed 800 single family homes. Results for the expected weekday trip generation for the new project are shown in **Table 1**. The complete trip generation calculations can be found in the Appendix.



Figure 4 – Existing Weekday Peak Hour and Daily Traffic Volumes



LEGEND:

- XX = Weekday AM Peak Hour
- (XX) = Weekday PM Peak Hour
- Vehicle Trips Per Hour
- NEW ACCESS
- EXISTING ROAD



Table 1 – Weekday Project Site Generated Trips

Time Period	Proposed Single Family Detached Housing
Average Daily, Inbound (vtpd)	3,808
Average Daily, Outbound (vtpd)	3,808
Total Daily	7,616
AM Peak Hour, Inbound (vtph)	150
AM Peak Hour, Outbound (vtph)	450
Total AM Peak	600
PM Peak Hour, Inbound (vtph)	504
PM Peak Hour, Outbound (vtph)	296
Total PM Peak	800

vtpd - vehicle trips per day, vtph - vehicle trips per hour

Trip Distribution & Assignment

Trip distribution for the project was based on existing traffic patterns, roadway improvements as part of the project, and future roadway development in the Pima Association of Governments (PAG) Regional Transportation Plan (RTP). It is expected that a large portion of site traffic will use the Wilmot Road improvements to access I-10 to the north. However, it is likely that some traffic will travel to and from Sahuarita Road to gain access to the Nogales Highway (Business Route I-19) and Interstate-19 (I-19) west of the site. **Figure 5** shows the weekday trip distribution for the project as a percentage of net new primary trips.

Figures 6 shows the assignment of the new site generated trips to the project intersections within the study area.

Existing Traffic Operations

Analysis of current intersection operations was conducted for the weekday AM and PM peak hours using the nationally accepted methodology set forth in the *Highway Capacity Manual*, Transportation Research Board, 2010. The computer software HCS 2010 was utilized to calculate the levels of service for individual movements, approaches, and for the intersections as a whole.

Level of service (LOS) is a qualitative measure of the traffic operations at an intersection or on a roadway segment. Level of service is ranked from LOS A, which signifies little or no congestion and is the highest rank, to LOS F, which signifies congestion and jam conditions. LOS D is typically considered adequate operation at un-signalized intersections in developed areas.



Figure 5 – Weekday Peak Hour Trip Distribution

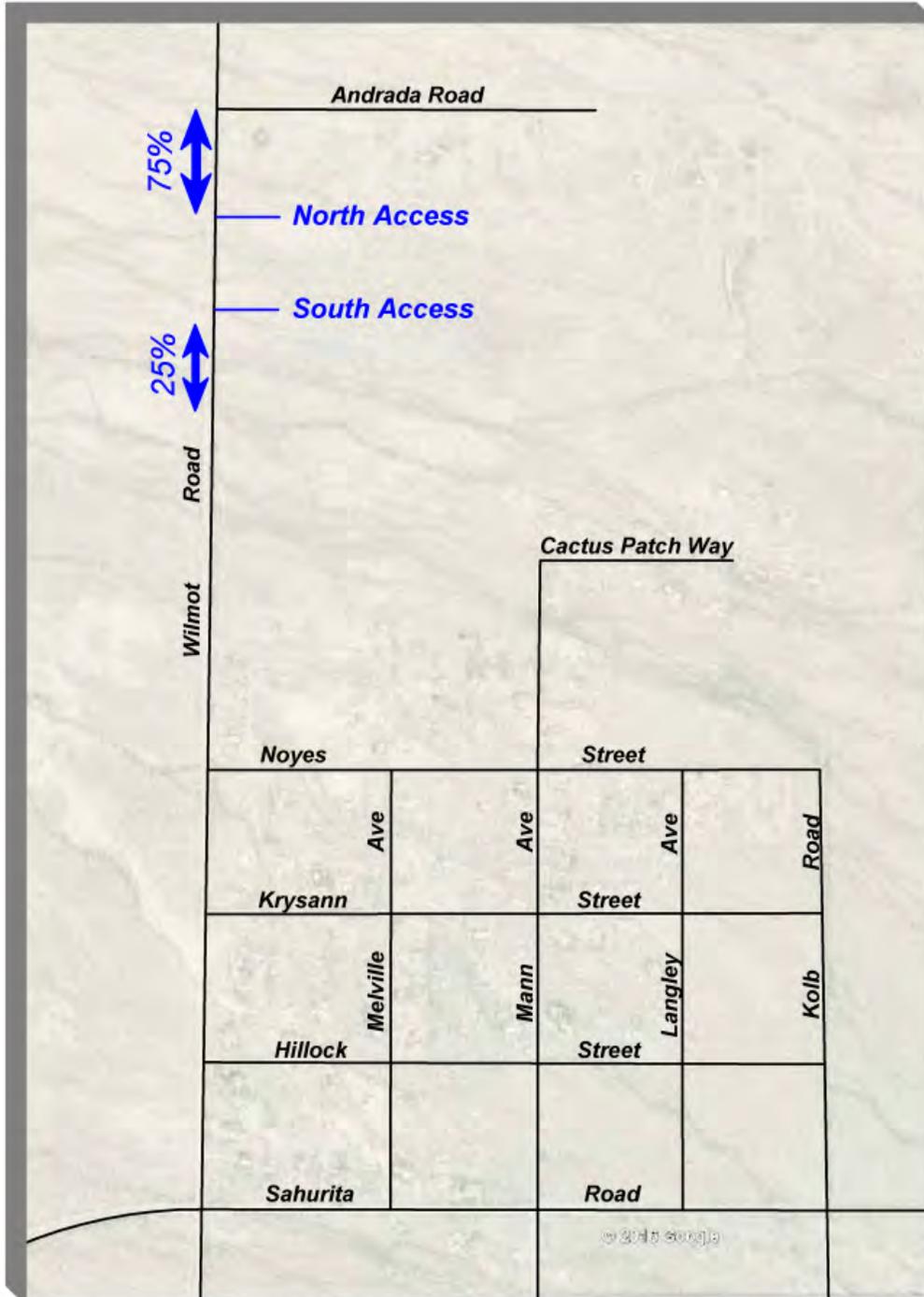
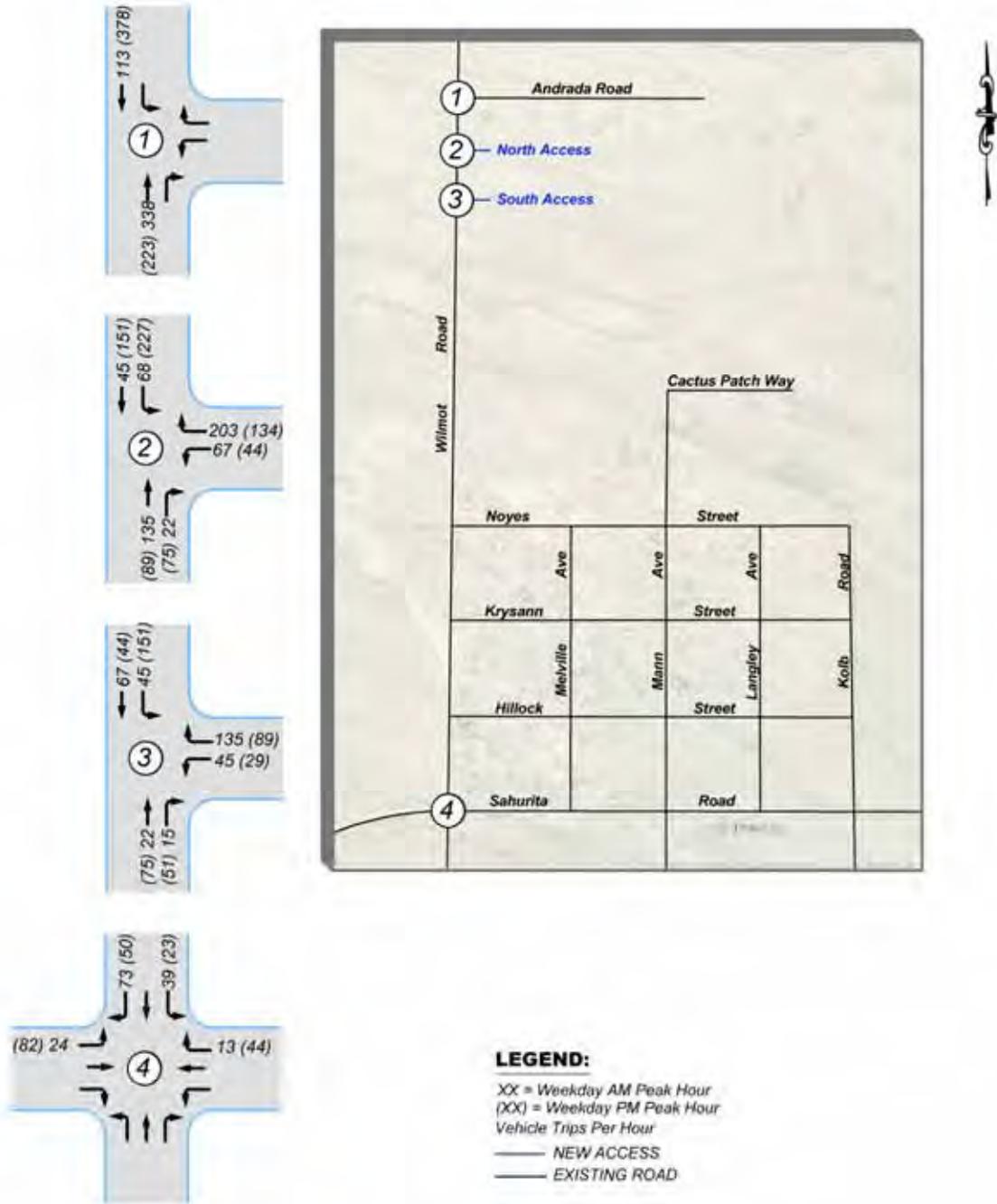




Figure 6 – Weekday Peak Hour Trip Assignment





At un-signalized intersections, level of service is predicted/calculated for those movements which must either stop for or yield to oncoming traffic and is based on average control delay for the particular movement. Control delay is the portion of total delay attributed to traffic control measures such as stop signs and traffic signals. The criteria for level of service at un-signalized intersections are shown below in **Table 2**.

Table 2 – Level of Service Criteria – Un-signalized Intersections

Level-of-Service	Delay
A	≤ 10 seconds
B	> 10 and ≤ 15 seconds/vehicle
C	> 15 and ≤ 25 seconds/vehicle
D	> 25 and ≤ 35 seconds/vehicle
E	> 35 and ≤ 50 seconds/vehicle
F	> 50 seconds per vehicle

Existing levels of service were calculated for the project intersections. The results of this analysis are shown in **Table 3**. Complete capacity calculations are included in the Appendix.

Table 3 – Existing Peak Hour Levels of Service

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Un-signalized Intersections				
Andrada Road/Wilmot Road				
Westbound Left/Right	A	8.6	A	8.6
Southbound Left/Through	A	7.2	A	7.2
Wilmot Road/Sahuarita Road				
Eastbound Left/Through/Right	A	8.0	A	7.6
Westbound Left/Through/Right	A	7.5	A	8.1
Northbound Left/Through/Right	B	11.9	B	13.7
Southbound Left/Through/Right	B	11.2	B	11.9

Delay - seconds per vehicle

As shown in **Table 3**, the existing study intersections currently operate at an adequate LOS B or better for all movements during the AM and PM weekday peak hours.

Future Traffic Operations Without Project

In order to assess the impacts of the project on future traffic operations, traffic projections were made for the years 2018 and 2023.

Per Pima County direction, an 11% annual growth rate was used to determine the future weekday peak hour traffic volumes. Using the 11% annual traffic growth rate, 2018 and 2023 weekday peak hour traffic volumes without the project were estimated as shown in **Figures 7 and 8**.



As with the current volumes, levels of service were calculated for the study intersections for 2018 and 2023 without the project. Levels of service for 2018 and 2023 without the project are shown in **Table 4 and 5**. Complete capacity calculations are included in the Appendix.

Table 4 – 2018 Peak Hour Levels of Service Without Project

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Un-signalized Intersections				
Andrada Road/Wilmot Road				
Westbound Left/Right	A	8.5	A	8.5
Southbound Left/Through	A	7.2	A	7.2
Wilmot Road/Sahuarita Road				
Eastbound Left/Through/Right	A	8.3	A	7.7
Westbound Left/Through/Right	A	7.6	A	8.4
Northbound Left/Through/Right	B	13.4	C	16.2
Southbound Left/Through/Right	B	12.6	B	14.0

Delay - seconds per vehicle

Table 5 – 2023 Peak Hour Levels of Service Without Project

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Un-signalized Intersections				
Andrada Road/Wilmot Road				
Westbound Left/Right	A	8.6	A	8.6
Southbound Left/Through	A	7.3	A	7.3
Wilmot Road/Sahuarita Road				
Eastbound Left/Through/Right	A	9.2	A	8.2
Westbound Left/Through/Right	A	7.9	A	9.6
Northbound Left/Through/Right	D	26.6	E	36.3
Southbound Left/Through/Right	C	20.2	D	28.7

Delay - seconds per vehicle

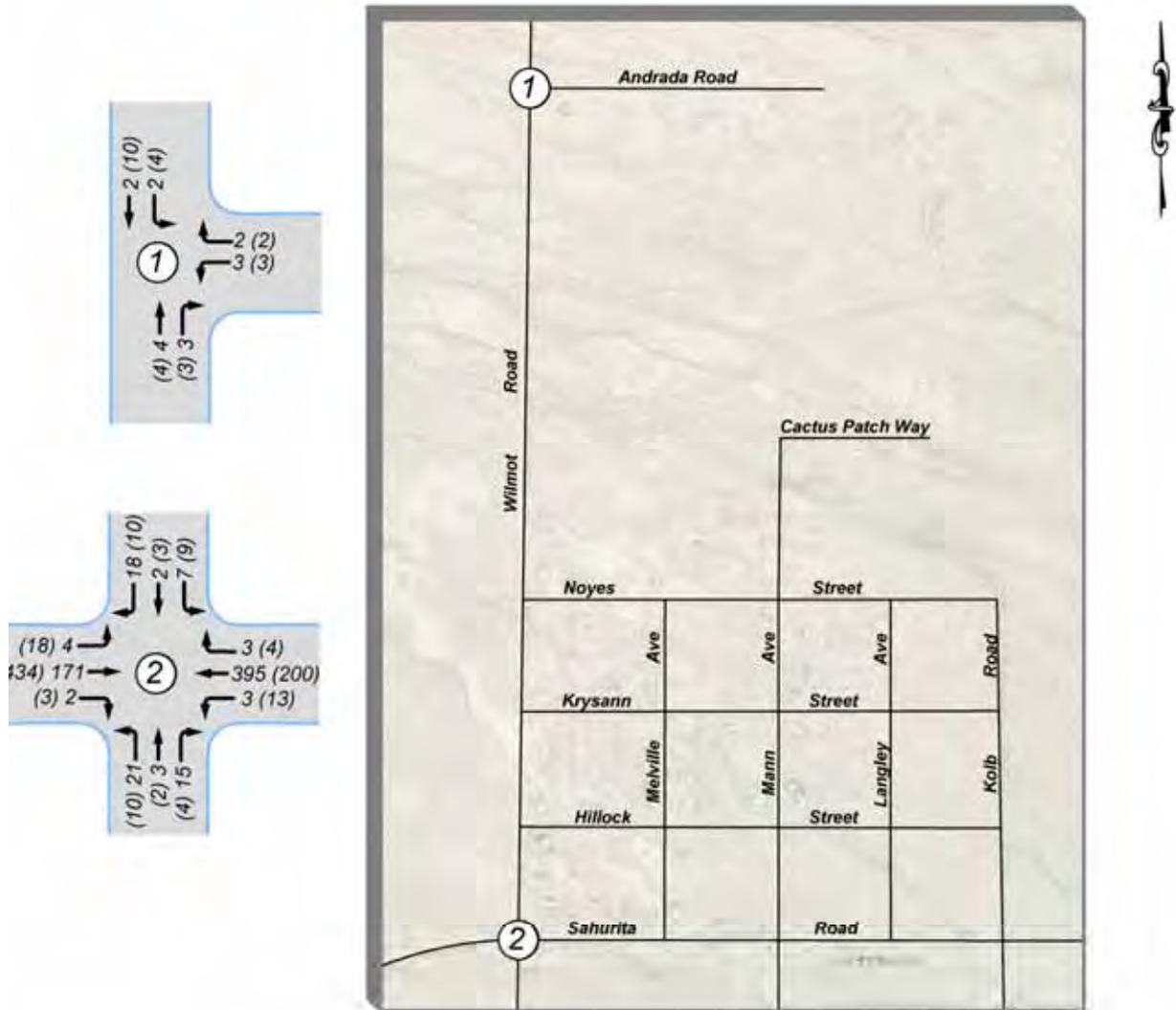
As shown in **Tables 4 and 5**, the intersection of Andrada Road/Wilmot Road is predicted to continue to experience an adequate LOS during the weekday AM and PM peak hours of 2018 and 2023, without traffic from the project.

The northbound approach at the Wilmot Road/Sahuarita Road intersection is expected to operate at an inadequate LOS during the PM peak hour in 2023 without the project. This delay is caused by a lack of roadway capacity that limits gaps on Sahuarita Road due to the large through volumes.

The remaining movements at the intersection of Wilmot Road/Sahuarita Road are expected to perform at an adequate LOS during the AM and PM peak hours in 2018 and 2023, without the project.



Figure 7 – 2018 Weekday Peak Hour Traffic Volumes Without Project

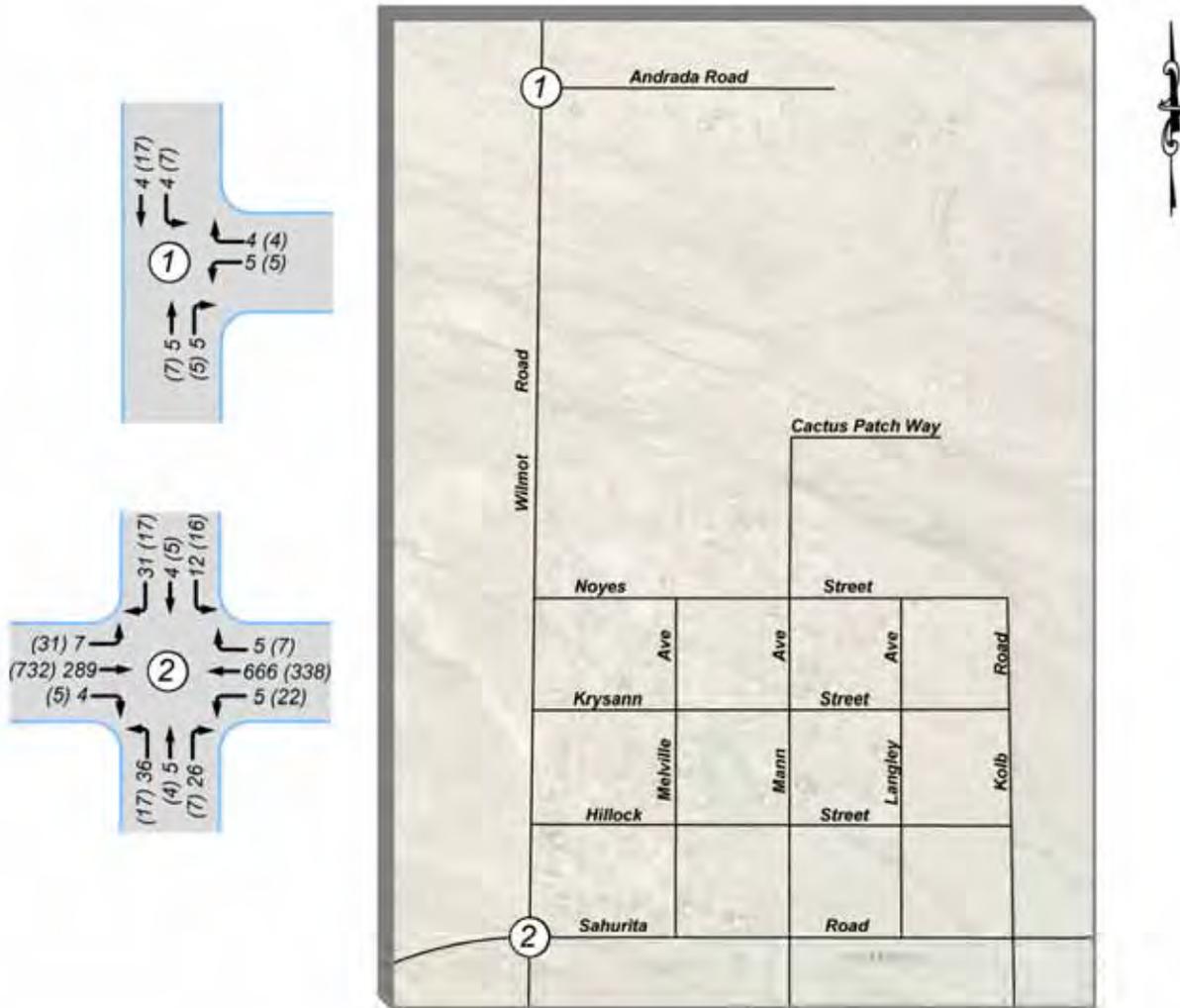


LEGEND:

- XX = Weekday AM Peak Hour
- (XX) = Weekday PM Peak Hour
- Vehicle Trips Per Hour
- NEW ACCESS
- EXISTING ROAD



Figure 8 – 2023 Weekday Peak Hour Traffic Volumes Without Project





Future Traffic Operations With Project

In order to assess the impacts of the project on future traffic operations, levels of service were calculated for each project study intersection for the years 2018 and 2023, with the project. Weekday peak hour traffic volumes for 2018 and 2023 without the project were combined with the estimated trips generated by the project to yield weekday peak hour traffic volumes with the project as shown in **Figures 9 and 10**.

Weekday intersection levels of service for 2018 and 2023 with the project were then calculated as shown in **Tables 6 and 7**. Complete capacity calculations are included in the Appendix.

As shown in **Table 6**, the study intersections, as well as the proposed project access points, are predicted to operate at an adequate LOS C or better during the weekday peak hours of 2018, with traffic from the project.

Table 6 – 2018 Peak Hour Levels of Service With Project

Intersection	2018 Without Project				2018 With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
Un-signalized Intersections	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Andrada Road/Wilmot Road								
Westbound Left/Right	A	8.5	A	8.5	B	11.4	B	12.2
Southbound Left/Through	A	7.2	A	7.2	A	8.1	A	7.8
Wilmot Road/Sahuarita Road								
Eastbound Left/Through/Right	A	8.3	A	7.7	A	8.4	A	8.1
Westbound Left/Through/Right	A	7.6	A	8.4	A	7.6	A	8.4
Northbound Left/Through/Right	B	13.4	C	16.2	C	16.1	C	23.2
Southbound Left/Through/Right	B	12.6	B	14.0	C	16.4	C	18.6
North Access/Wilmot Road								
Westbound Left	N/A		N/A		B	12.0	C	20.9
Westbound Right					B	10.6	A	9.8
Southbound Left/Through					A	7.7	A	8.2
South Access/Wilmot Road								
Westbound Left	N/A		N/A		B	10.2	B	13.5
Westbound Right					A	9.1	A	9.3
Southbound Left/Through					A	7.4	A	7.9

Delay - seconds per vehicle



Figure 9 – 2018 Weekday Peak Hour Traffic Volumes With Project

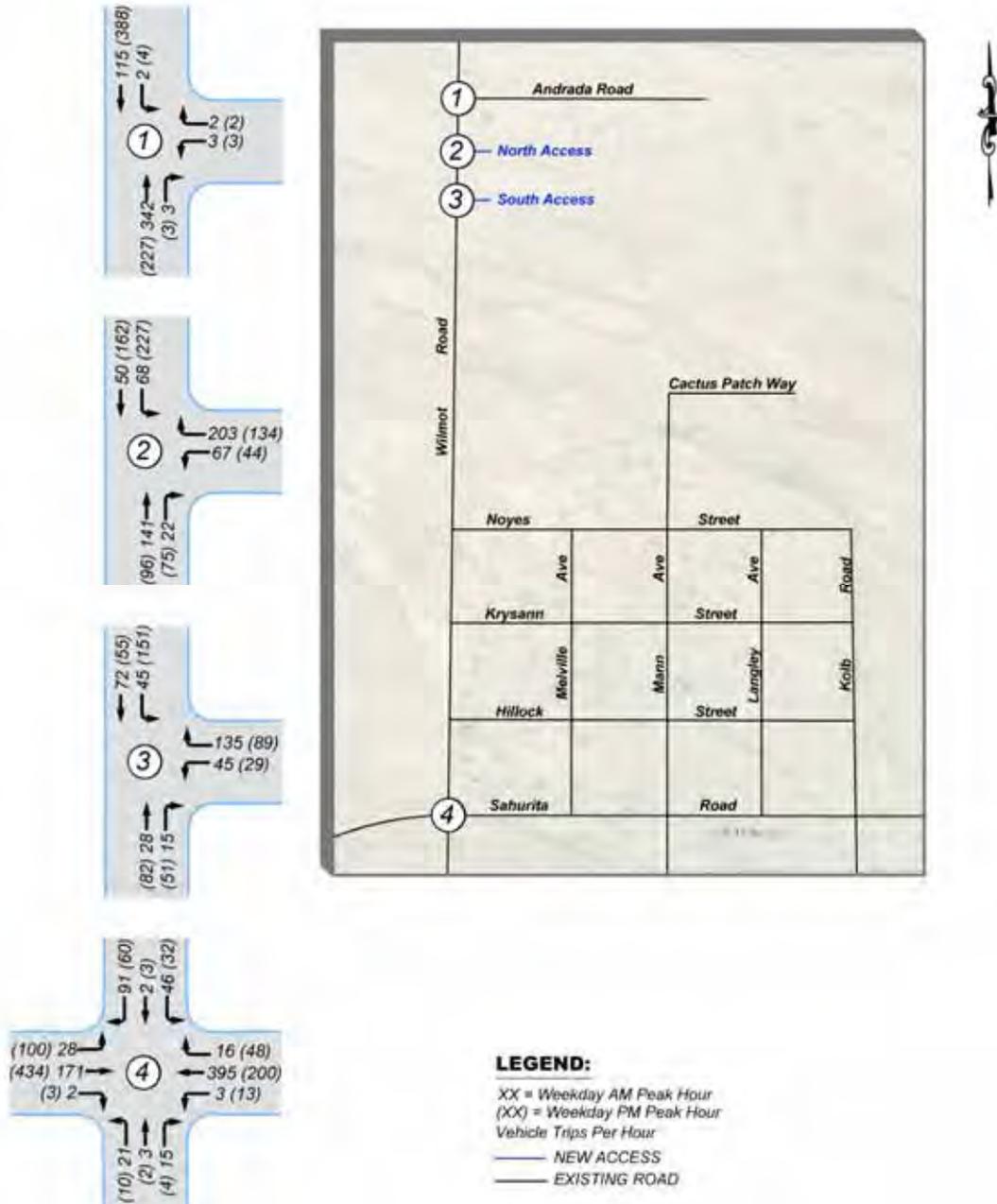




Figure 10 – 2023 Weekday Peak Hour Traffic Volumes With Project

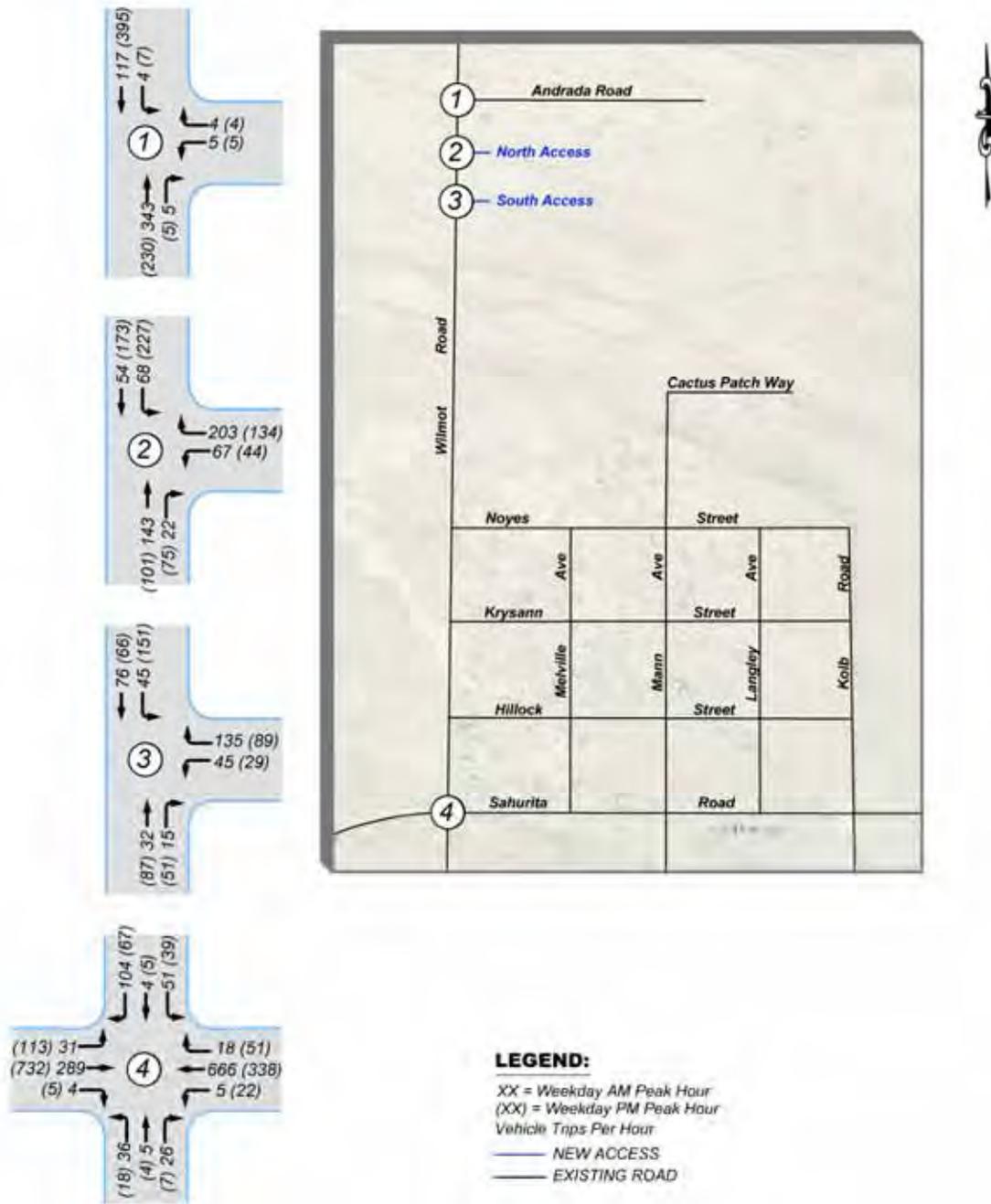




Table 7 – 2023 Peak Hour Levels of Service With Project

Intersection	2023 Without Project				2023 With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
Un-signalized Intersections	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Andrada Road/Wilmot Road								
Westbound Left/Right	A	8.6	A	8.6	B	11.5	B	12.5
Southbound Left/Through	A	7.3	A	7.3	A	8.1	A	7.8
Wilmot Road/Sahuarita Road								
Eastbound Left/Through/Right	A	9.2	A	8.2	A	9.4	A	8.6
Westbound Left/Through/Right	A	7.9	A	9.6	A	7.9	A	9.6
Northbound Left/Through/Right	D	26.6	E	36.3	E	43.0	F	73.9
Southbound Left/Through/Right	C	20.2	D	28.7	E	44.1	F	85.4
North Access/Wilmot Road								
Westbound Left	N/A		N/A		B	12.1	C	21.4
Westbound Right					B	10.6	A	9.9
Southbound Left/Through					A	7.8	A	8.2
South Access/Wilmot Road								
Westbound Left	N/A		N/A		B	10.3	B	13.7
Westbound Right					A	9.1	A	9.4
Southbound Left/Through					A	7.4	A	7.9

Delay - seconds per vehicle

Table 7 shows that the intersection of Andrada Road/Wilmot Road is predicted to operate at an adequate LOS for the weekday AM and PM peak hours in 2018 and 2023, without and with the project.

The northbound and southbound movements at the Wilmot Road/Sahuarita Road intersection are expected to operate at an inadequate LOS during the AM and PM peak hours in 2023 without and with the project. These delays are a result of a lack of capacity on Sahuarita Road, limiting the number of acceptable gaps for vehicles turning from Wilmot Road.

The remaining movements at the Wilmot Road/Sahuarita Road intersection are predicted to operate at adequate LOS during the AM and PM peak hours in 2018 and 2023 without and with the project.

Turn Lane Analysis

A key element of this study is to determine if left and right turn lanes are required at the study intersections without and with the project.

The latest edition of the *Pima County Traffic Impact Studies/Traffic Memoranda Procedures* provides warrant criteria to determine the need for left and right turn lanes at unsignalized intersections. The criteria for determining if left and right turn lanes are needed are based on vehicle speeds, peak hour traffic volumes and the turning traffic volume during the peak hour.



When needed, turn lanes remove the slow turning traffic from the through traffic stream, improving capacity and reducing rear-end crashes. **Table 8** shows the locations that were evaluated for turn lanes without and with the project.

Table 8 – Turn Lane Warrants

Intersection	Direction	Turn Treatment Analyzed	Turn Treatments Warranted Without Project?	Turn Treatments Warranted With Project?
Andrada Road/Wilmot Road	Northbound	Right Turn Lane	No	No
Andrada Road/Wilmot Road	Southbound	Left Turn Lane	No	No
Wilmot Road/Sahuarita Road	Eastbound	Left Turn Lane	Yes	Yes
Wilmot Road/Sahuarita Road	Eastbound	Right Turn Lane	No	No
Wilmot Road/Sahuarita Road	Westbound	Left Turn Lane	Yes	Yes
Wilmot Road/Sahuarita Road	Westbound	Right Turn Lane	No	Yes
North Access/Wilmot Road	Northbound	Right Turn Lane	n/a	No
North Access/Wilmot Road	Southbound	Left Turn Lane		Yes
South Access/Wilmot Road	Northbound	Right Turn Lane	n/a	No
South Access/Wilmot Road	Southbound	Left Turn Lane		Yes

Table 8 shows that based on the 2023 weekday peak hour traffic volumes with the project, southbound left turn lanes from Wilmot Road into the project site will be warranted at the North and South Access points.

Eastbound and westbound left turn lanes at the intersection of Wilmot Road/Sahuarita Road are warranted without and with the project. In addition, a westbound right turn lane is warranted with the project at the intersection of Wilmot Road/Sahuarita Road.

Another key element of this study is to determine the storage length for the left turn/right turn lanes warranted at the proposed access points.

The queue storage requirements were calculated using the following methods as recommended in *A Policy of Geometric Design of Highways and Streets* (AASHTO, 2011).

For un-signalized intersections, storage for vehicles likely to arrive in an average two-minute period within the peak hour should be provided.

$$\begin{aligned} \text{Vehicles per 2 min. period} &= (\text{vehicles/hour}) \div (30 \text{ periods/hour}) \\ \text{Storage length} &= \text{vehicles per 2 min. period} \times 25 \text{ feet} \end{aligned}$$



Based on the 2023 weekday peak hour traffic volumes with the project, the storage lengths were found for the warranted turn lanes as shown in **Table 9**. The computed value is typically rounded up to the nearest twenty-five feet. Complete storage length calculations can be found in the Appendix.

Table 9 – Calculated Queue Lengths

Intersection	Left Turn Storage				Right Turn Storage			
	NB	SB	EB	WB	NB	SB	EB	WB
Wilmot Road/Sahuarita Road								
Turning Volume (vph)			113	22				51
S _{calculated} =			94	18				43
S _{rounded} =			100	25				50
North Access/Wilmot Road								
Turning Volume (vph)		227						
S _{calculated} =		189						
S _{rounded} =		200						
South Access/Wilmot Road								
Turning Volume (vph)		151						
S _{calculated} =		126						
S _{rounded} =		150						

S - storage in feet, vph - vehicles per hour

As shown in **Table 9**, the southbound left turn lanes from Wilmot Road should provide 200 feet of storage at the North Access and 150 feet of storage at the South Access.

Storage lengths for the eastbound and westbound turn lanes at the intersection of Wilmot Road/Sahuarita Road range from 25 feet to 100 feet of storage.

Crash Analysis

Available crash history for the Wilmot Road/Sahuarita Road study intersection was obtained from Pima County for the latest available five year time frame, April 2011 through March 2016. Two crashes were recorded at the intersection during this time span.

Results of the crash analysis are shown in **Table 10**.



Table 10 – Crash Analysis at Wilmot Road/Sahuarita Road

Year	Crash Type							Fatal	Injury	Crash Totals
	Angle	Left Turn	Rear-End	Sideswipe	Single Vehicle	Head On	Other			
From April 2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	2	0	1	2
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
To March 2016	0	0	0	0	0	0	0	0	0	0
5-Year Total	0	0	0	0	0	0	2	0	1	2

One crash occurred in April 2012 while it was dark. The crash was classified as a single vehicle, property damage only accident in which the vehicle struck a traffic sign at the intersection. The driver was cited for traveling too fast for conditions.

The second crash took place in May 2012 during the day and involved an injury. Vehicle 1, traveling eastbound on Sahuarita Road, attempted to pass Vehicle 2 on the left and struck Vehicle 2 while it was making an eastbound left turn. The driver was cited for speed too fast for conditions.

Crash history was also reviewed on Wilmot Road from Andrada Road to Sahuarita Road for the same five year period. The results of the review are shown in **Table 11**.

Table 11 – Crash Analysis on Wilmot Road: Andrada Road to Sahuarita Road

Year	Crash Type							Fatal	Injury	Crash Totals
	Angle	Left Turn	Rear-End	Sideswipe	Single Vehicle	Head On	Other			
From April 2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	1	0	0	0	0	1
To March 2016	0	0	0	0	0	0	0	0	0	0
5-Year Total	0	0	0	0	1	0	0	0	0	1

The only crash on Wilmot Road was recorded in January 2014. It was a day time crash that involved a single vehicle, property damage only, in which the driver fell asleep and hit the dirt embankment.

A total of three crashes were reported over the five year study period. This small number of crashes over a five year duration does not appear to illustrate any crash trend or pattern.



This crash summary only includes incidents where a police officer was contacted and wrote a report, otherwise, there is no record of the crash. It is possible that there were other minor crashes in the area, however the Sheriff’s Department was not contacted and no official record of these crashes exist.

A safety analysis was also conducted on Wilmot Road between Sahuarita Road and Andrada Road (1.9 miles) based on the data contained in the *Highway Safety Manual (HSM)*. Chapter 10 of the HSM provides safety performance functions (SPF’s) which are used to predict average crash frequency for a selected year for specific base conditions. A base condition would set the average frequency encompassing all two-lane roadways throughout Pima County. In this case Pima County has not set a base condition for crash frequency on two-lane roadways. In the vicinity of the project, Wilmot Road is currently being constructed to provide a two-lane, two-way roadway that is expected to be completed in 2017. Based on national data contained in the HSM, the predicted average annual crash frequency for a rural two-lane, two-way roadway segment is as follows from equation 10-6 of the HSM:

$$N = AADT \times L \times 365 \times 10^{-6} \times e^{(-0.312)}$$

Where:

N = predicted total annual crash frequency for roadway segment base conditions

AAADT = average annual daily traffic volumes (vehicles per day)

L = length of roadway segment (miles)

The 2045 Pima Association of Governments (PAG) traffic model projects a future volume of nearly 18,000 vehicles per day (vpd) on Wilmot Road near the project area. Using a linear, annual growth rate, between 2016 and 2045, daily traffic volumes (vpd) on Wilmot Road were calculated for year 2018 and 2023. The daily traffic volume on Wilmot Road was estimated to be approximately 1,540 vpd in 2018 and 4,590 vpd in 2023, without the project. The predicted average crash frequency in years 2018 and 2023 without the project is as follows:

$$N_{2018\text{without}} = 1,540 \times 1.9 \times 365 \times 10^{-6} \times e^{(-0.312)}$$

$$N_{2018\text{without}} \approx .78 \text{ crashes per year}$$

$$N_{2023\text{without}} = 4,590 \times 1.9 \times 365 \times 10^{-6} \times e^{(-0.312)}$$

$$N_{2023\text{without}} \approx 2.33 \text{ crashes per year}$$

Total daily trip generation of the proposed development (3,810 vpd) was added to the traffic flow on Wilmot Road) in order to predict the average annual crash frequency in years 2018 and 2023 with the project.

$$N_{2018\text{with}} = 5,350 \times 1.9 \times 365 \times 10^{-6} \times e^{(-0.312)}$$

$$N_{2018\text{with}} \approx 2.72 \text{ crashes per year}$$



$$N_{2023\text{with}} = 8,400 \times 1.9 \times 365 \times 10^{-6} \times e^{(-0.312)}$$

$$N_{2023\text{with}} \approx 4.26 \text{ crashes per year}$$

As shown above, the predicted average crash frequency in years 2018 and 2023 is between one and four crashes per year without and with traffic from the proposed site.

This safety evaluation assumes that the Andrada Wilmot project will be fully constructed and have full occupancy in year 2018 and 2023.

It is expected that the 2045 PAG projected traffic volumes on Wilmot Road include trips associated with local developments such as the Andrada Wilmot development. With this in mind, trips associated with the Andrada Wilmot development are most likely captured in $N_{2018\text{without}}$ and $N_{2023\text{without}}$.

Mitigation

Northbound and southbound movements at the intersection of Wilmot Road/Sahuarita Road are anticipated to operate at inadequate LOS during the AM and PM peak hours of 2023 without and with the project. A lack of roadway capacity that limits gaps on Sahuarita Road due to the large through volumes results in an inadequate delay. Mitigation measures can be proposed to improve the LOS for the movements that are predicted to operate inadequately during the future horizon years.

With the installation of exclusive left turn lanes on each approach to the intersection of Wilmot Road/Sahuarita Road, all of the movements at this intersection are predicted to operate at an adequate LOS D or better during the weekday peak hours of 2023.

Table 12 shows the proposed mitigation measures and the corresponding levels of service for the intersection of Wilmot Road/Sahuarita Road.

Table 12 – Mitigation Measures

Intersection	Improvement	2023 Without Mitigation				2023 With Mitigation			
		AM Peak		PM Peak		AM Peak		PM Peak	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized Intersections									
Wilmot Road/Sahuarita Road	Install exclusive left turn lanes on each approach.								
Eastbound Left/Through/Right		A	9.4	A	9.4	N/A		N/A	
Eastbound Left		N/A		N/A		A	9.4	A	8.6
Westbound Left/Through/Right		A	7.9	A	9.6	N/A		N/A	
Westbound Left		N/A		N/A		A	7.9	A	9.6
Northbound Left/Through/Right		E	43.0	F	73.9	N/A		N/A	
Northbound Left		N/A		N/A		D	29.7	D	30.9
Northbound Through/Right		N/A		N/A		B	11.8	C	18.3
Southbound Left/Through/Right		E	44.1	F	85.4	N/A		N/A	
Southbound Left		N/A		N/A		C	21.3	D	34.8
Southbound Through/Right	N/A		N/A		C	17.6	B	12.7	

Delay - seconds per vehicle



Conclusion

When fully completed, the proposed Wilmot Park development is predicted to generate an additional 7,616 vehicle trips per day (vtpd) on weekdays to the adjacent street system from the new project site. Fifty percent of these new trips (3,808 vehicle trips) will be into the project and fifty percent will be out of the project.

According to the 2040 Regional Transportation Plan (RTP), the corridor of Wilmot Road from Sahuarita Road to I-10 will be paved by winter 2017. This improvement will provide the Andrada Wilmot property with direct access to I-10, to the north, and Sahuarita Road, to the south, via a two-lane, paved roadway. It is anticipated that the new roadway will provide sufficient capacity to accommodate the traffic generated from the site based on the recommended improvements below.

The intersection of Andrada Road/Wilmot Road currently operates, and is predicted to continue operating at an adequate LOS during the weekday AM and PM peak hours of 2018 and 2023 without and with traffic from the proposed project.

The intersection of Wilmot Road/Sahuarita Road currently operates at an adequate LOS, it is expected that the northbound approach to the intersection will begin operating at an inadequate LOS during the PM peak hour in 2023 without the project. With the addition of traffic from the project, the southbound movements are also predicted to experience an inadequate LOS during the PM peak hour in 2023. This delay is caused by a lack of roadway capacity that limits gaps on Sahuarita Road due to the large through volumes. The remaining movements at Wilmot Road/Sahuarita Road are expected to perform at an adequate LOS during the AM and PM peak hours in 2018 and 2023 without and with traffic from the project.

Based on the 2023 weekday peak hour traffic volumes with the project, left turn lanes from Wilmot Road into the project site will be warranted at the North and South Access points.

Eastbound and westbound left turn lanes at the intersection of Wilmot Road/Sahuarita Road are warranted without and with the project. In addition, a westbound right turn lane is warranted with the project at the intersection of Wilmot Road/Sahuarita Road.

Available crash history for the Wilmot Road/Sahuarita Road study intersection was obtained from Pima County for the latest available five year time frame. Two crashes were recorded at the intersection during this time span. Crash history was also reviewed on Wilmot Road from Andrada Road to Sahuarita Road for the same five year period. A total of three crashes were reported over the five year study period.

A safety analysis was conducted on Wilmot Road between Sahuarita Road and Andrada Road based on the methods presented in the *Highway Safety Manual (HSM)*. Results of the safety evaluation show that the predicted average crash frequency in years 2018 and 2023 is between one and four crashes per year without and with traffic from the proposed site.



It is expected that the 2045 PAG projected traffic volumes on Wilmot Road include trips associated with local developments such as the Andrada Wilmot development. With this in mind, trips associated with the Andrada Wilmot development are most likely captured in the frequency calculations without project site data additions.

With the northbound and southbound movements at the intersection of Wilmot Road/Sahuarita Road anticipated to operate at inadequate LOS during the AM and PM peak hours of 2023 without and with the project. Mitigation measures can improve the LOS for the movements that are predicted to operate inadequately during the future horizon years. With the installation of exclusive left turn lanes on each approach to the intersection of Wilmot Road/Sahuarita Road, all of the movements at this intersection are predicted to operate at an adequate LOS D or better during the weekday peak hours of 2023.

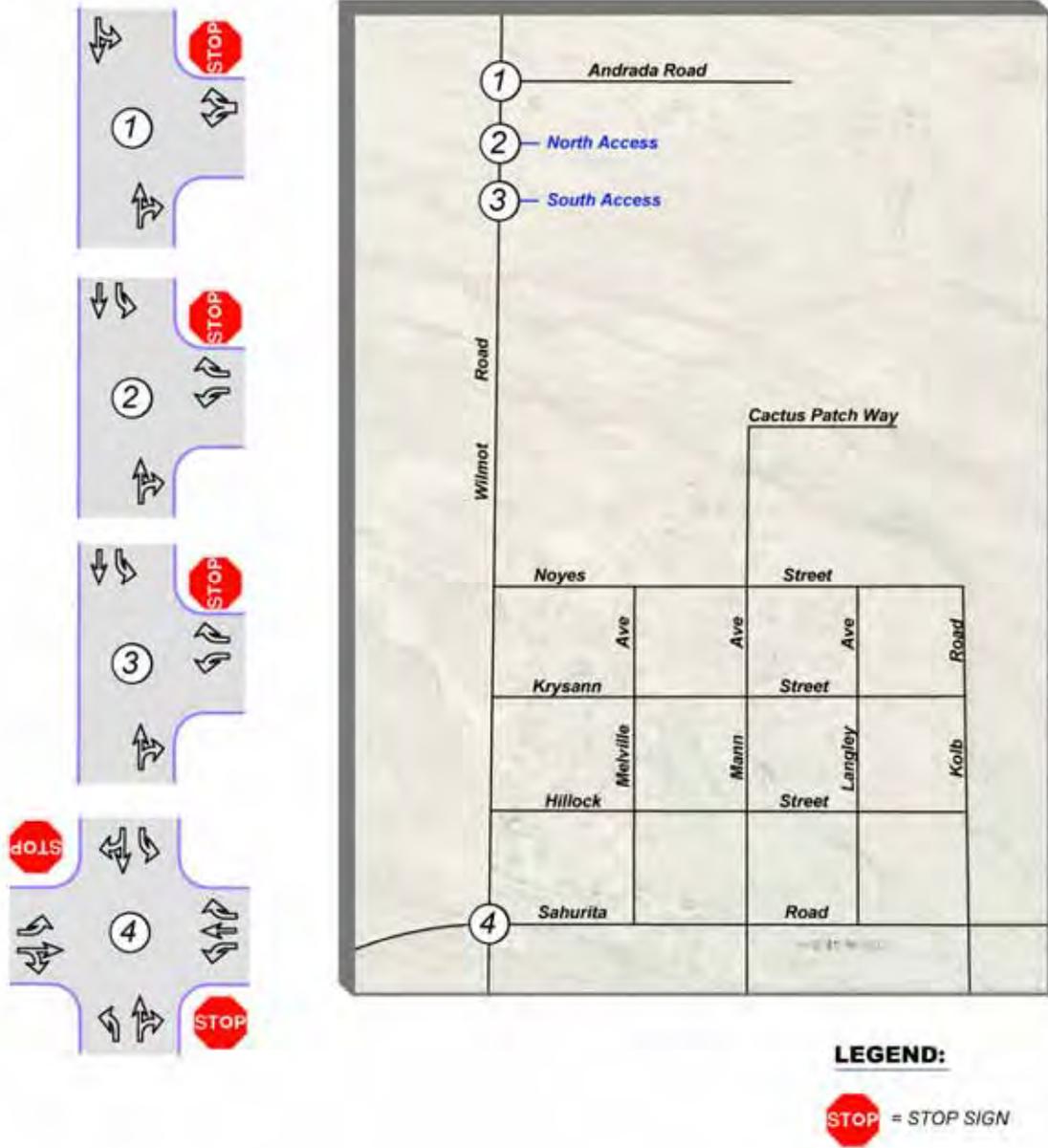
Southbound left turn lanes into the project should be constructed at the intersections of North Access/Wilmot Road and South Access/Wilmot Road.

Exclusive left turn lanes should be constructed on all approaches to the Wilmot Road/Sahuarita Road intersection. An exclusive right turn should also be constructed on the westbound approach to the intersection of Wilmot Road/Sahuarita Road.

Proposed lane configurations and traffic control for 2018 and 2023, with the project, are shown in **Figure 11**.



Figure 11 – Proposed Lane Configurations and Traffic Control





**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

APPENDIX

Traffic Counts

Trip Generation Calculations

Capacity Calculations

Turn Lane Analysis

Crash Analysis

Comment Resolution



**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

APPENDIX

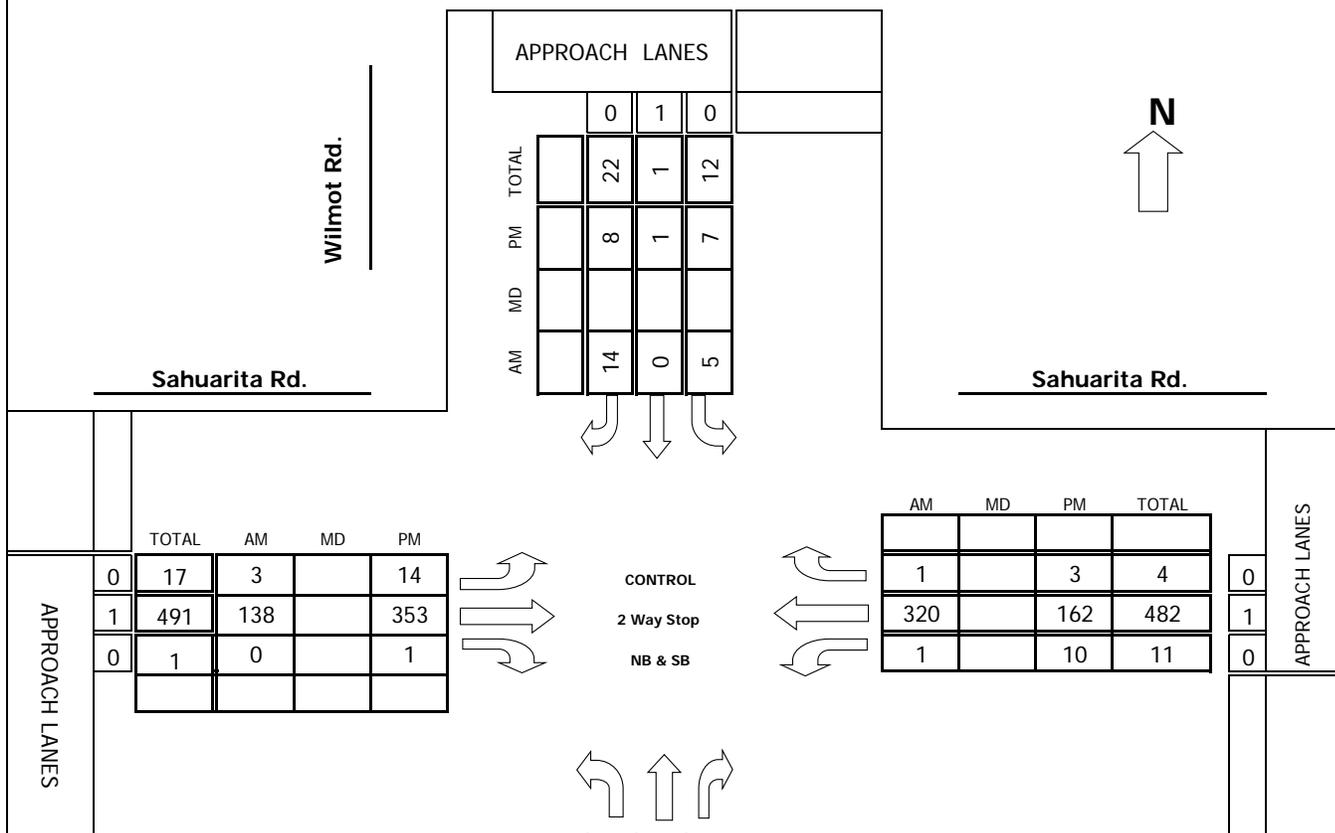
Traffic Counts

Intersection Turning Movement Prepared by:



Project #: 16-1155-002

TMC SUMMARY OF Wilmot Rd. & Sahuarita Rd.



APPROACH LANES		TOTAL	AM	MD	PM
	0	17	3		14
	1	491	138		353
	0	1	0		1

		AM	MD	PM
		17	1	12
		25	1	15
		0	1	0
		APPROACH LANES		

	AM	MD	PM	TOTAL	
	1		3	4	0
	320		162	482	1
	1		10	11	0
					APPROACH LANES

LOCATION #: 16-1155-002

TURNING MOVEMENT COUNT

Wilmot Rd. & Sahuarita Rd.
(Intersection Name)

WEDNESDAY 04/20/2016
Day Date

COUNT PERIODS

AM	700AM - 900AM
NOON	-
PM	400PM - 600PM

AM PEAK HOUR 700 AM
NOON PEAK HOUR _____
PM PEAK HOUR 400 PM

Intersection Turning Movement

Prepared by:



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



N-S STREET: **Wilmot Rd.** DATE: **04/20/2016** LOCATION: **Sahuarita**
 E-W STREET: **Sahuarita Rd.** DAY: **WEDNESDAY** PROJECT# **16-1155-002**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM	0	1	0	0	1	0	0	1	0	0	1	0	
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	6	0	6	3	0	4	1	29	0	0	92	0	141
7:15 AM	4	1	3	0	0	1	1	40	0	0	74	0	124
7:30 AM	6	0	2	2	0	3	0	38	0	1	84	0	136
7:45 AM	1	0	1	0	0	6	1	31	0	0	70	1	111
8:00 AM	1	0	1	1	0	2	0	35	0	0	38	1	79
8:15 AM	3	1	2	0	0	1	0	31	0	0	45	1	84
8:30 AM	2	0	1	0	0	0	0	35	0	0	47	0	85
8:45 AM	2	0	0	1	0	0	0	32	0	0	22	0	57
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	25	2	16	7	0	17	3	271	0	1	472	3	817
Approach %	58.14	4.65	37.21	29.17	0.00	70.83	1.09	98.91	0.00	0.21	99.16	0.63	
App/Depart	43	/	8	24	/	1	274	/	294	476	/	514	

AM Peak Hr Begins at: 700 AM

PEAK

Volumes	17	1	12	5	0	14	3	138	0	1	320	1	512
Approach %	56.67	3.33	40.00	26.32	0.00	73.68	2.13	97.87	0.00	0.31	99.38	0.31	

PEAK HR.

FACTOR:	0.625	0.679	0.860	0.875	0.908
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CONTROL: **2 Way Stop (NB & SB)**
 COMMENT 1:
 GPS: **31.963028, -110.858783**

Intersection Turning Movement



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



N-S STREET: Wilmot Rd. DATE: 04/20/2016 LOCATION: Sahuarita
 E-W STREET: Sahuarita Rd. DAY: WEDNESDAY PROJECT# 16-1155-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
LANES:	0	1	0	0	1	0	0	1	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	2	0	1	0	0	3	2	106	1	2	43	0	160
4:15 PM	0	0	0	0	0	3	5	77	0	3	51	1	140
4:30 PM	4	0	2	2	0	1	3	74	0	2	31	0	119
4:45 PM	2	0	0	5	1	1	4	96	0	3	37	2	151
5:00 PM	0	0	0	1	1	2	4	75	1	2	51	3	140
5:15 PM	1	0	1	4	0	0	0	80	0	3	36	1	126
5:30 PM	1	0	1	1	1	3	3	89	1	3	35	1	139
5:45 PM	0	0	2	2	0	1	1	77	0	2	47	1	133
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	10	0	7	15	3	14	22	674	3	20	331	9	1108
Approach %	58.82	0.00	41.18	46.88	9.38	43.75	3.15	96.42	0.43	5.56	91.94	2.50	
App/Depart	17	/	31	32	/	26	699	/	696	360	/	355	

PM Peak Hr Begins at: 400 PM

PEAK

Volumes	8	0	3	7	1	8	14	353	1	10	162	3	570
Approach %	72.73	0.00	27.27	43.75	6.25	50.00	3.80	95.92	0.27	5.71	92.57	1.71	

PEAK HR.

FACTOR:	0.458	0.571	0.844	0.795	0.891
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CONTROL: 2 Way Stop (NB & SB)

COMMENT 1: 0

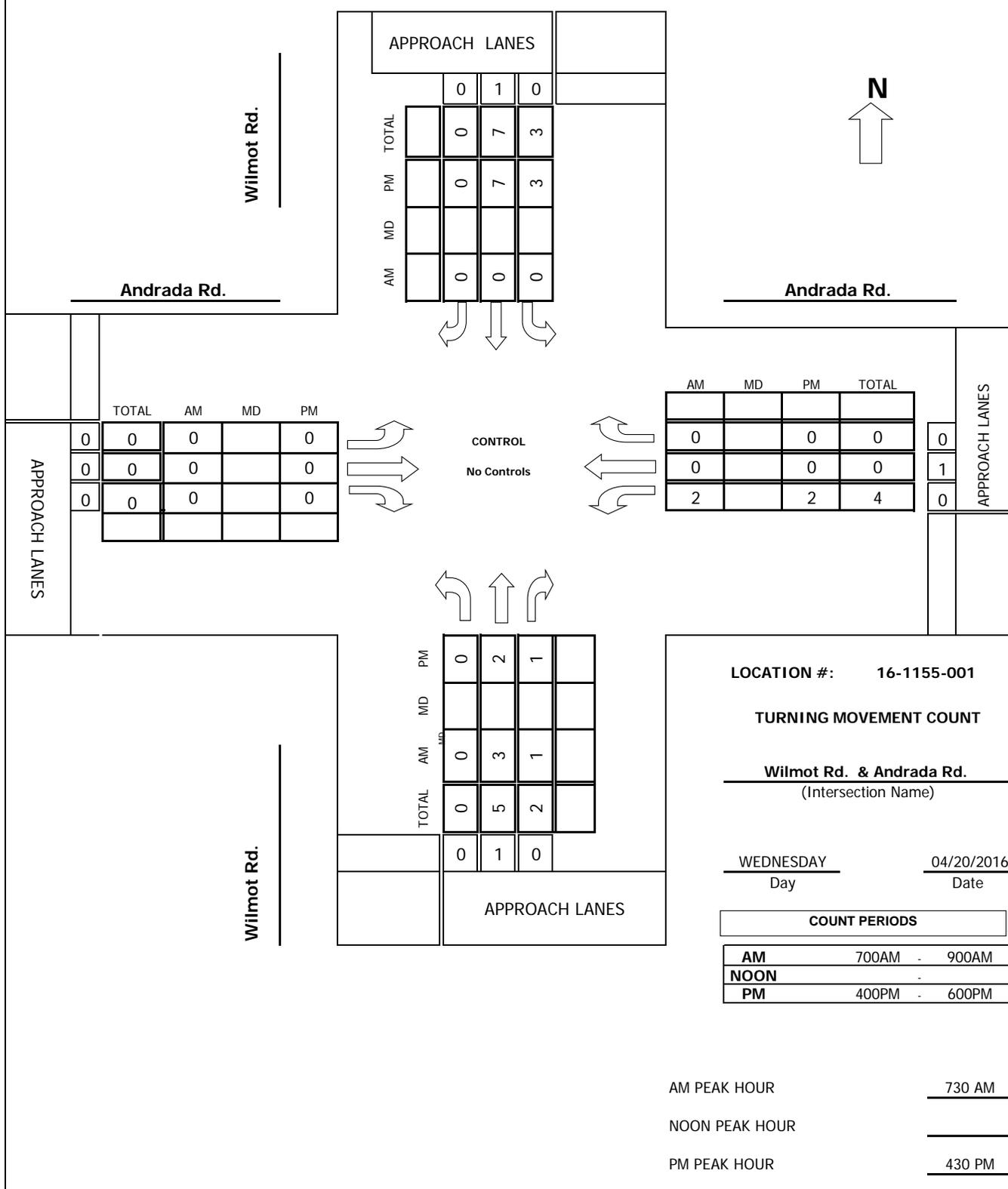
GPS: 31.963028, -110.858783

Intersection Turning Movement Prepared by:



Project #: 16-1155-001

TMC SUMMARY OF Wilmot Rd. & Andrada Rd.



Intersection Turning Movement

Prepared by:



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



veracitytrafficgroup

N-S STREET: Wilmot Rd. DATE: 04/20/2016 LOCATION: Sahuarita
 E-W STREET: Andrada Rd. DAY: WEDNESDAY PROJECT#: 16-1155-001

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	1
7:45 AM	0	0	1	0	0	0	0	0	0	1	0	0	2
8:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	4	1	0	0	0	0	0	0	2	0	0	7
Approach %	0.00	80.00	20.00	####	####	####	####	####	####	100.00	0.00	0.00	
App/Depart	5	/	4	0	/	2	0	/	1	2	/	0	

AM Peak Hr Begins at: 730 AM

PEAK

Volumes	0	3	1	0	0	0	0	0	0	2	0	0	6
Approach %	0.00	75.00	25.00	####	####	####	####	####	####	100.00	0.00	0.00	

PEAK HR.

FACTOR:	0.500	0.000	0.000	0.500	0.750
---------	-------	-------	-------	-------	-------

CONTROL: No Controls

COMMENT 1:

GPS:

31.990566, -110.858938

Intersection Turning Movement



FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



N-S STREET: Wilmot Rd. DATE: 04/20/2016 LOCATION: Sahuarita
 E-W STREET: Andrada Rd. DAY: WEDNESDAY PROJECT# 16-1155-001

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	0	1	0	0	1	0	0	0	0	0	1	0	0
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	1	0	0	2	0	0	0	0	1	0	1	5
4:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	3	2	0	0	0	0	2	0	0	7
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
5:00 PM	0	1	1	0	1	0	0	0	0	0	0	0	3
5:15 PM	0	0	0	0	3	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	2	0	0	0	0	2	0	0	4
5:45 PM	0	0	0	0	1	0	0	0	0	2	0	0	3
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	3	1	3	13	0	0	0	0	7	0	1	28
Approach %	0.00	75.00	25.00	18.75	81.25	0.00	####	####	####	87.50	0.00	12.50	
App/Depart	4	/	4	16	/	20	0	/	4	8	/	0	

PM Peak Hr Begins at: 430 PM

PEAK

Volumes	0	2	1	3	7	0	0	0	0	2	0	0	15
Approach %	0.00	66.67	33.33	30.00	70.00	0.00	####	####	####	100.00	0.00	0.00	

PEAK HR.

FACTOR:	0.375	0.500	0.000	0.250	0.536
---------	-------	-------	-------	-------	-------

CONTROL: No Controls
 COMMENT 1: 0
 GPS: 31.990566, -110.858938



**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

APPENDIX

Trip Generation Calculations

Single-Family Detached Housing

LAND USE: 800 dwelling units Single Family Detached Housing

TRIP GENERATION CALCULATIONS ARE BASED ON THE INSTITUTE OF TRANSPORTATION ENGINEERS' TRIP GENERATION, 9TH EDITION. THE ITE LAND USE CODE IS Single Family Detached Housing (210)

WEEKDAY

Average Rate = 9.52 Trips per dwelling unit (SF)

$T = 9.52 \text{ Trips} \times 800 \text{ SF}$

T = 7,616 VPD

ENTER: $(0.5) \times (7616) = 3,808 \text{ VPD}$

EXIT: $(0.5) \times (7616) = 3,808 \text{ VPD}$

AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)

Average Rate = 0.75 Trips per dwelling unit (SF)

$T = 0.75 \text{ Trips} \times 800 \text{ SF}$

T = 600 VPH

ENTER: $(0.25) \times (600) = 150 \text{ VPH}$

EXIT: $(0.75) \times (600) = 450 \text{ VPH}$

PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)

Average Rate = 1 Trips per dwelling unit (SF)

$T = 1 \text{ Trips} \times 800 \text{ SF}$

T = 800 VPH

ENTER: $(0.63) \times (800) = 504 \text{ VPH}$

EXIT: $(0.37) \times (800) = 296 \text{ VPH}$

*where, T = trip ends

TRIP GENERATION SUMMARY

WEEKDAY

7,616 VTPD

AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)

600 VTPH

PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)

800 VPH



**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

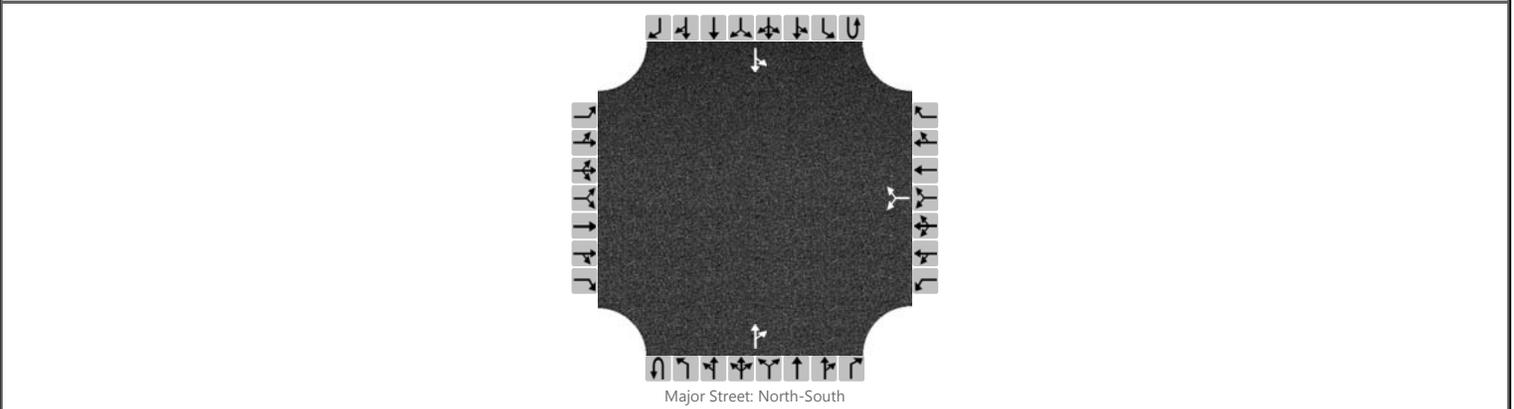
APPENDIX

Capacity Calculations

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Andrada Rd
Analysis Year	2016	North/South Street	Wilmot Rd
Time Analyzed	Existing AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						2		0			3	1		0	0	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

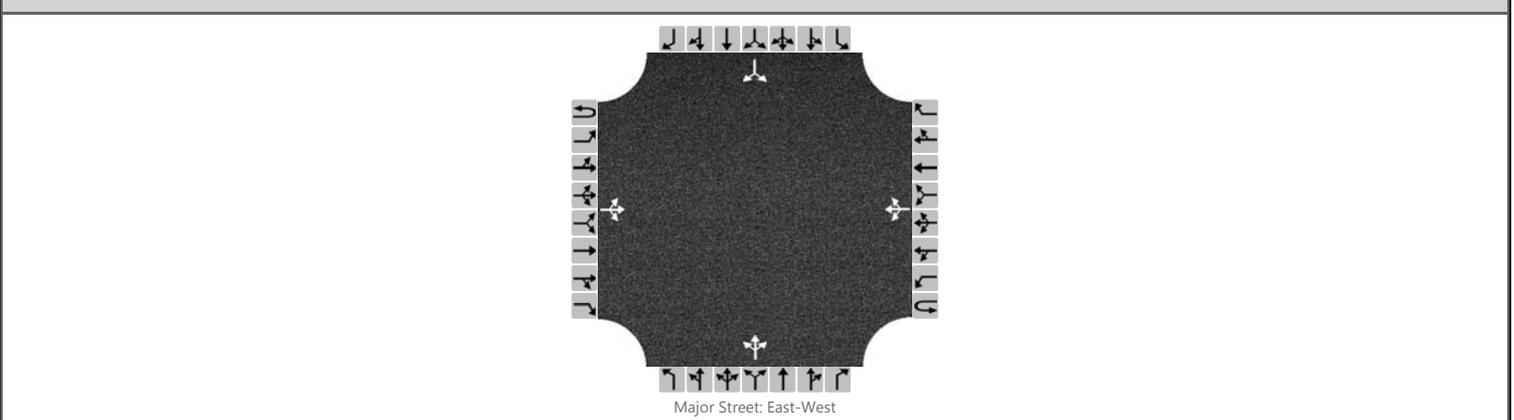
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							2									
Capacity							1015							1609		
v/c Ratio							0.00									
95% Queue Length							0.0									
Control Delay (s/veh)							8.6							7.2		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					8.6											
Approach LOS					A											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Sahuarita Rd
Analysis Year	2016	North/South Street	Wilmot Rd
Time Analyzed	Existing AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration			LTR				LTR				LTR				LR	
Volume (veh/h)		3	138	0		1	320	1		17	1	12		5		14
Percent Heavy Vehicles		3				3				3	3	3		3		3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

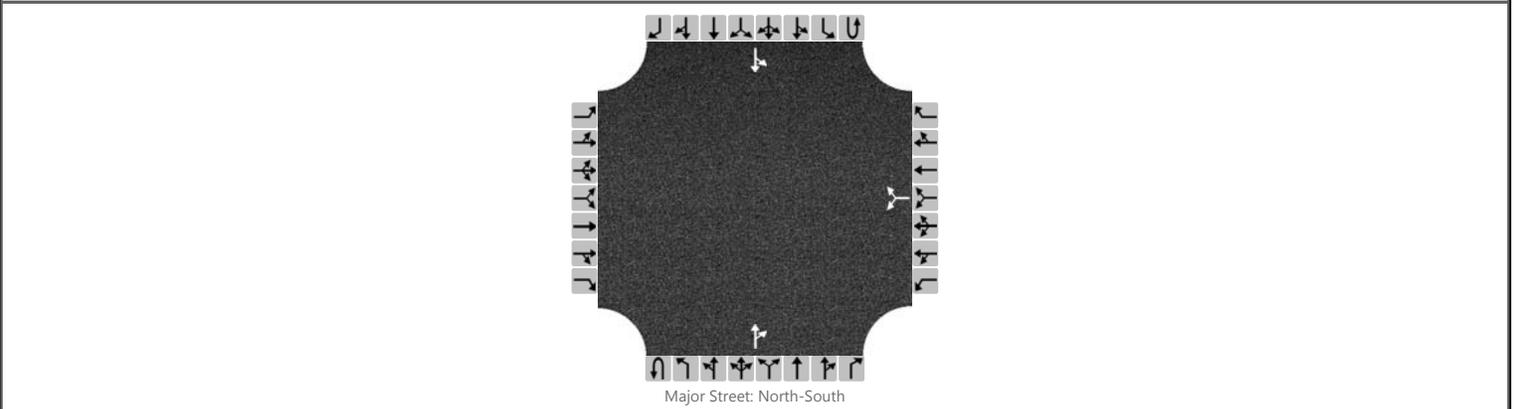
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		3				1					33					22	
Capacity		1195				1420					558					601	
v/c Ratio		0.00				0.00					0.06					0.04	
95% Queue Length		0.0				0.0					0.2					0.1	
Control Delay (s/veh)		8.0				7.5					11.9					11.2	
Level of Service (LOS)		A				A					B					B	
Approach Delay (s/veh)		0.2				0.0				11.9				11.2			
Approach LOS		A				A				B				B			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Andrada Rd
Analysis Year	2016	North/South Street	Wilmot Rd
Time Analyzed	Existing PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0		0	1	0		0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						2		0			2	1		3	7	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

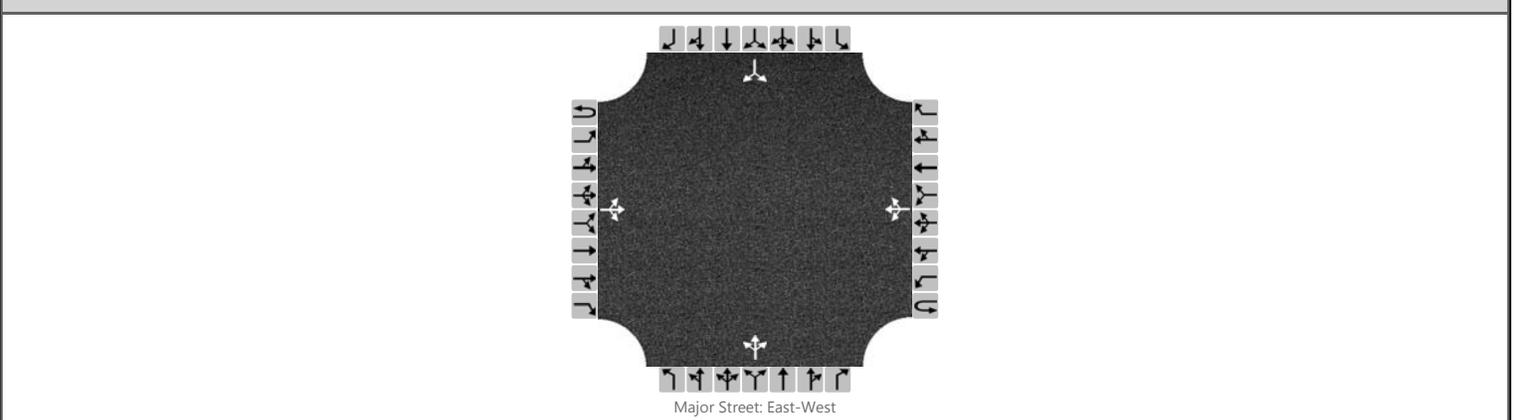
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							2							11		
Capacity							997							1610		
v/c Ratio							0.00							0.01		
95% Queue Length							0.0							0.0		
Control Delay (s/veh)							8.6							7.2		
Level of Service (LOS)							A							A		
Approach Delay (s/veh)					8.6								2.0			
Approach LOS					A								A			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Sahuarita Rd
Analysis Year	2016	North/South Street	Wilmot Rd
Time Analyzed	Existing PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	0	0
Configuration			LTR				LTR				LTR				LR	
Volume (veh/h)		14	353	1		10	162	3		8	0	3		7		8
Percent Heavy Vehicles		3				3				3	3	3		3		3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

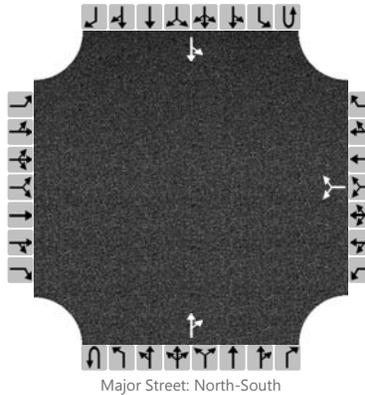
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		16				11					12					17
Capacity		1384				1159					424					542
v/c Ratio		0.01				0.01					0.03					0.03
95% Queue Length		0.0				0.0					0.1					0.1
Control Delay (s/veh)		7.6				8.1					13.7					11.9
Level of Service (LOS)		A				A					B					B
Approach Delay (s/veh)	0.4				0.5				13.7				11.9			
Approach LOS	A				A				B				B			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Road/Wilmot Road
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Andrada Road
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 AM Peak Hour Without	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						3		2			4	3		2	2	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

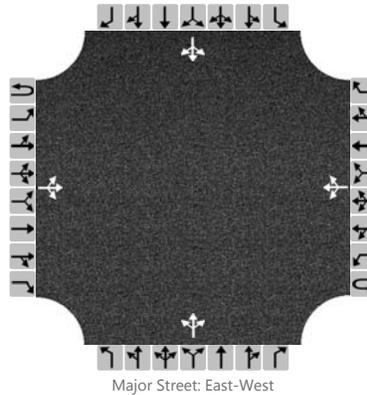
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							5								4		
Capacity							1030								1605		
v/c Ratio							0.00								0.00		
95% Queue Length							0.0								0.0		
Control Delay (s/veh)							8.5								7.2		
Level of Service (LOS)							A								A		
Approach Delay (s/veh)					8.5								3.6				
Approach LOS					A												

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Sahuarita Road
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 AM Peak Hour Without	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		4	171	2		3	395	3		21	3	15		7	2	18
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

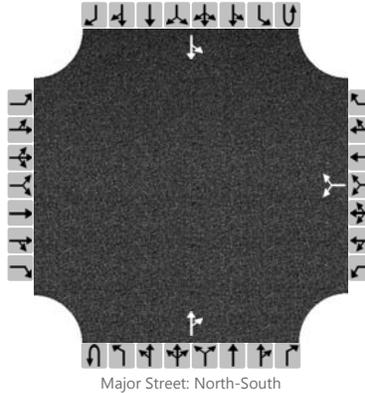
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		4				3					43					30	
Capacity		1112				1374					470					503	
v/c Ratio		0.00				0.00					0.09					0.06	
95% Queue Length		0.0				0.0					0.3					0.2	
Control Delay (s/veh)		8.3				7.6					13.4					12.6	
Level of Service (LOS)		A				A					B					B	
Approach Delay (s/veh)		0.2				0.1				13.4				12.6			
Approach LOS		A				A				B				B			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Andrada Road
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 PM Peak Hour Without	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration							LR					TR		LT			
Volume (veh/h)						3		2			4	3		4	10		
Percent Heavy Vehicles						3		3						3			
Proportion Time Blocked																	
Right Turn Channelized	No				No				No				No				
Median Type	Undivided																
Median Storage																	

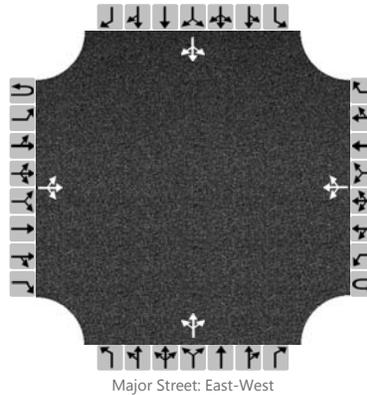
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						5								15			
Capacity						1019								1605			
v/c Ratio						0.00								0.01			
95% Queue Length						0.0								0.0			
Control Delay (s/veh)						8.5								7.2			
Level of Service (LOS)						A								A			
Approach Delay (s/veh)					8.5								1.9				
Approach LOS					A												

HCS 2010 Two-Way Stop Control Summary Report

General Information				Site Information			
Analyst	Matthew Reeg			Intersection	Sahuarita Rd/Wilmot Rd		
Agency/Co.	Southwest Traffic Eng			Jurisdiction	Pima County		
Date Performed	5/4/2016			East/West Street	Sahuarita Road		
Analysis Year	2018			North/South Street	Wilmot Road		
Time Analyzed	2018 PM Peak Hour Without			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Andrada Wilmot						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		18	434	3		13	200	4		10	2	4		9	3	10
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

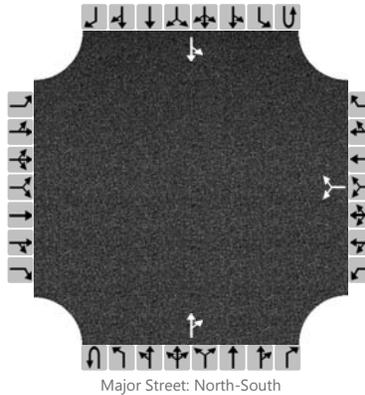
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		20				14					17					24	
Capacity		1335				1072					337					426	
v/c Ratio		0.01				0.01					0.05					0.06	
95% Queue Length		0.0				0.0					0.2					0.2	
Control Delay (s/veh)		7.7				8.4					16.2					14.0	
Level of Service (LOS)		A				A					C					B	
Approach Delay (s/veh)		0.5				0.6				16.2				14.0			
Approach LOS		A				A				C				B			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Andrada Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 AM Peak Hour Without	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration							LR					TR		LT			
Volume (veh/h)						5		4			7	5		7	17		
Percent Heavy Vehicles						3		3						3			
Proportion Time Blocked																	
Right Turn Channelized	No				No				No				No				
Median Type	Undivided																
Median Storage																	

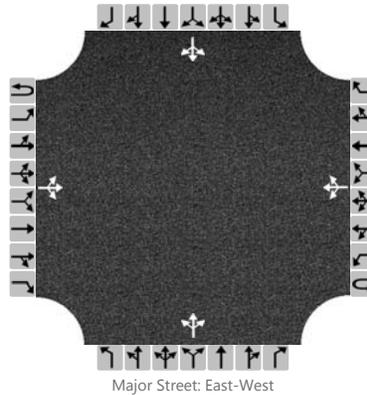
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						10									27		
Capacity						997									1596		
v/c Ratio						0.01									0.02		
95% Queue Length						0.0									0.0		
Control Delay (s/veh)						8.6									7.3		
Level of Service (LOS)						A									A		
Approach Delay (s/veh)					8.6								2.2				
Approach LOS					A												

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Road
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Sahuarita Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 AM Peak Hour Without	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	289	4		5	666	5		36	5	26		12	4	31
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

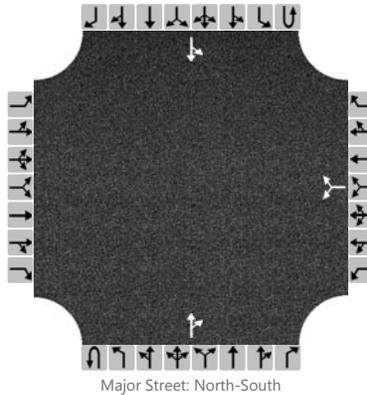
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		8			6					75						51	
Capacity		857			1228					240						287	
v/c Ratio		0.01			0.00					0.31						0.18	
95% Queue Length		0.0			0.0					1.3						0.6	
Control Delay (s/veh)		9.2			7.9					26.6						20.2	
Level of Service (LOS)		A			A					D						C	
Approach Delay (s/veh)		0.3				0.1				26.6				20.2			
Approach LOS										D				C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	5/4/2016	East/West Street	Andrada Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 PM Peak Hour Without	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0	
Configuration							LR					TR		LT			
Volume (veh/h)						5		4			7	5		7	17		
Percent Heavy Vehicles						3		3						3			
Proportion Time Blocked																	
Right Turn Channelized	No				No				No				No				
Median Type	Undivided																
Median Storage																	

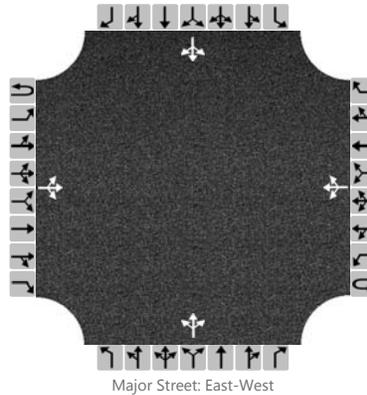
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						10									27		
Capacity						997									1596		
v/c Ratio						0.01									0.02		
95% Queue Length						0.0									0.0		
Control Delay (s/veh)						8.6									7.3		
Level of Service (LOS)						A									A		
Approach Delay (s/veh)					8.6								2.2				
Approach LOS					A												

HCS 2010 Two-Way Stop Control Summary Report

General Information				Site Information			
Analyst	Matthew Reeg			Intersection	Wilmot Rd/Sahuarita Road		
Agency/Co.	Southwest Traffic Eng			Jurisdiction	Pima County		
Date Performed	5/4/2016			East/West Street	Sahuarita Road		
Analysis Year	2023			North/South Street	Wilmot Road		
Time Analyzed	2023 PM Peak Hour Without			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Andrada Wilmot						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		31	732	5		22	338	7		17	4	7		16	5	17
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

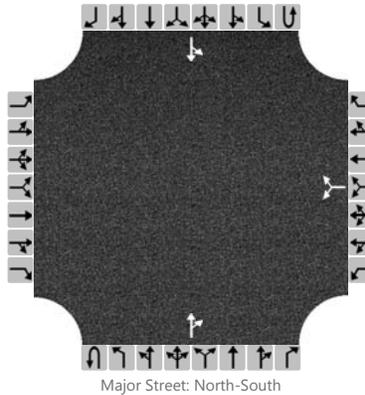
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		34				24					31					43	
Capacity		1168				805					145					194	
v/c Ratio		0.03				0.03					0.21					0.22	
95% Queue Length		0.1				0.1					0.8					0.8	
Control Delay (s/veh)		8.2				9.6					36.3					28.7	
Level of Service (LOS)		A				A					E					D	
Approach Delay (s/veh)		0.7				0.9				36.3				28.7			
Approach LOS		A				A				E				D			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Andrada Road
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						3		2			342	3		2	115	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

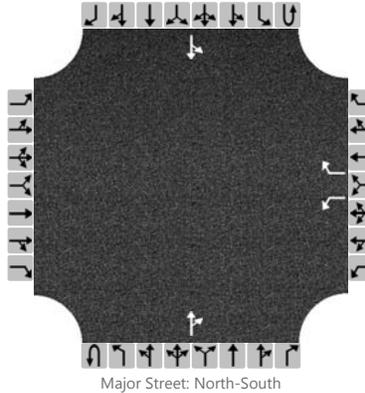
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							5								130	
Capacity							567								1169	
v/c Ratio							0.01								0.11	
95% Queue Length							0.0								0.0	
Control Delay (s/veh)							11.4								8.1	
Level of Service (LOS)							B								A	
Approach Delay (s/veh)					11.4								0.1			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information				Site Information			
Analyst	Matthew Reeg			Intersection	North Access/Wilmot Rd		
Agency/Co.	Southwest Traffic Eng			Jurisdiction	Pima County		
Date Performed	6/28/16			East/West Street	North Access		
Analysis Year	2018			North/South Street	Wilmot Road		
Time Analyzed	2018 AM Peak Hour With			Peak Hour Factor	0.90		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Andrada Wilmot						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						67		203			141	22		68	50	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

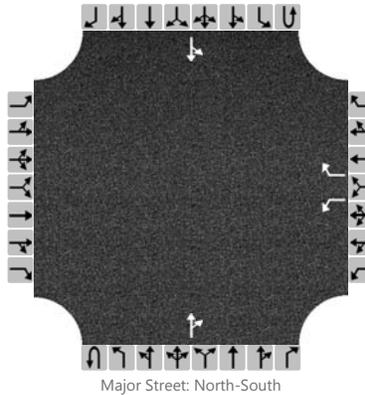
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						74		226						132		
Capacity						588		872						1387		
v/c Ratio						0.13		0.26						0.10		
95% Queue Length						0.4		1.0						0.2		
Control Delay (s/veh)						12.0		10.6						7.7		
Level of Service (LOS)						B		B						A		
Approach Delay (s/veh)					10.9								4.6			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	South Access/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	South Access
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						45		135			28	15		45	72	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

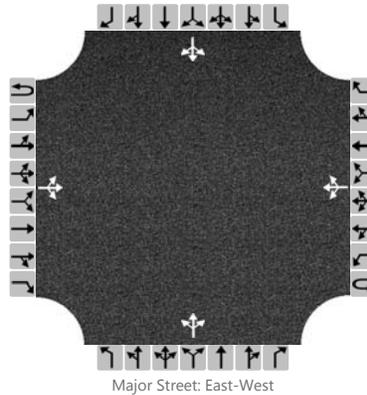
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)					50		150								130		
Capacity					741		1028								1551		
v/c Ratio					0.07		0.15								0.08		
95% Queue Length					0.2		0.5								0.1		
Control Delay (s/veh)					10.2		9.1								7.4		
Level of Service (LOS)					B		A								A		
Approach Delay (s/veh)					9.4								3.0				
Approach LOS					A												

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Sahuarita Road
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		28	171	2		3	395	16		21	3	15		46	2	91
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

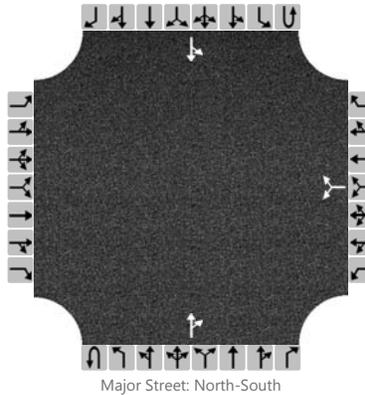
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		31				3					43					154	
Capacity		1097				1374					367					469	
v/c Ratio		0.03				0.00					0.12					0.33	
95% Queue Length		0.1				0.0					0.4					1.4	
Control Delay (s/veh)		8.4				7.6					16.1					16.4	
Level of Service (LOS)		A				A					C					C	
Approach Delay (s/veh)		1.4				0.1				16.1				16.4			
Approach LOS		A				A				C				C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Andrada Road
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						3		2			227	3		4	388	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

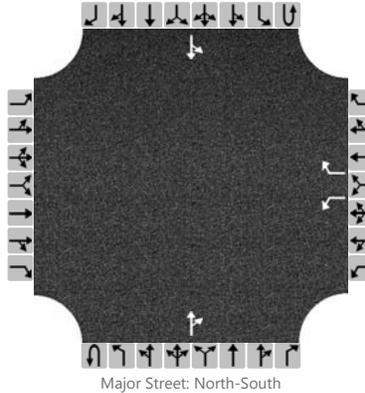
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							5								435	
Capacity							504								1303	
v/c Ratio							0.01								0.33	
95% Queue Length							0.0								0.0	
Control Delay (s/veh)							12.2								7.8	
Level of Service (LOS)							B								A	
Approach Delay (s/veh)					12.2								0.1			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	North Access/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	North Access
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						44		134			96	75		227	162	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

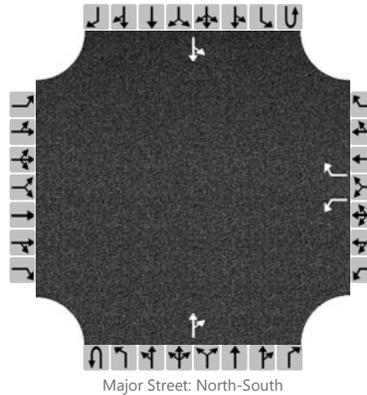
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						49		149						432		
Capacity						276		896						1376		
v/c Ratio						0.18		0.17						0.31		
95% Queue Length						0.6		0.6						0.7		
Control Delay (s/veh)						20.9		9.8						8.2		
Level of Service (LOS)						C		A						A		
Approach Delay (s/veh)					12.6								5.5			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	South Access/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	South Access
Analysis Year	2018	North/South Street	Wilmot Road
Time Analyzed	2018 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						29		89			82	51		151	55	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

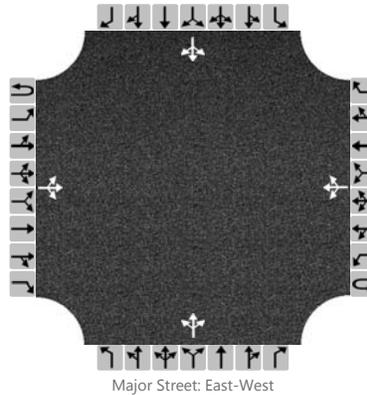
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						32		99						229		
Capacity						456		928						1426		
v/c Ratio						0.07		0.11						0.16		
95% Queue Length						0.2		0.4						0.4		
Control Delay (s/veh)						13.5		9.3						7.9		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.4								6.0			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information				Site Information			
Analyst	Matthew Reeg			Intersection	Wilmot Rd/Sahuarita Rd		
Agency/Co.	Southwest Traffic Eng			Jurisdiction	Pima County		
Date Performed	6/28/16			East/West Street	Sahuarita Road		
Analysis Year	2018			North/South Street	Wilmot Road		
Time Analyzed	2018 PM Peak Hour With			Peak Hour Factor	0.90		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Andrada Wilmot						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		100	434	3		13	200	48		10	2	4		34	3	58
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

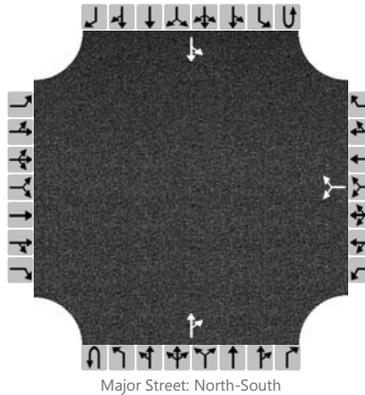
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		111				14					17					105		
Capacity		1281				1072					215					369		
v/c Ratio		0.09				0.01					0.08					0.28		
95% Queue Length		0.3				0.0					0.3					1.2		
Control Delay (s/veh)		8.1				8.4					23.2					18.6		
Level of Service (LOS)		A				A					C					C		
Approach Delay (s/veh)		2.3				0.5					23.2				18.6			
Approach LOS											C				C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Andrada Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		4			343	5		4	117	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

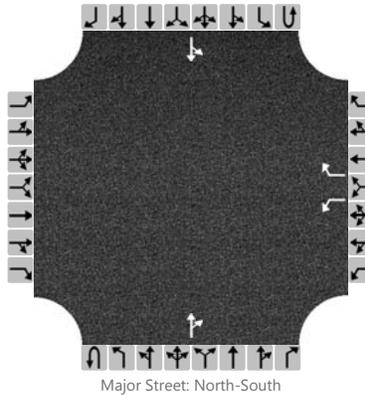
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							10								134	
Capacity							562								1165	
v/c Ratio							0.02								0.12	
95% Queue Length							0.1								0.0	
Control Delay (s/veh)							11.5								8.1	
Level of Service (LOS)							B								A	
Approach Delay (s/veh)					11.5								0.3			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information				Site Information			
Analyst	Matthew Reeg			Intersection	North Access/Wilmot Rd		
Agency/Co.	Southwest Traffic Eng			Jurisdiction	Pima County		
Date Performed	6/28/16			East/West Street	North Access		
Analysis Year	2023			North/South Street	Wilmot Road		
Time Analyzed	2023 AM Peak Hour With			Peak Hour Factor	0.90		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Andrada Wilmot						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						67		203			145	22		68	54	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

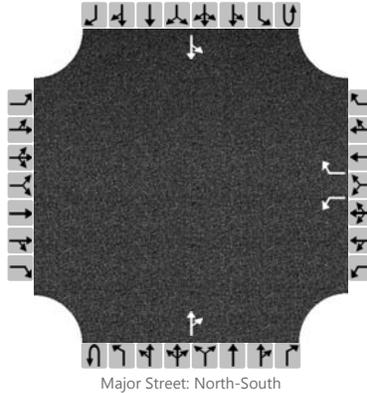
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						74		226						136		
Capacity						582		867						1382		
v/c Ratio						0.13		0.26						0.10		
95% Queue Length						0.4		1.0						0.2		
Control Delay (s/veh)						12.1		10.6						7.8		
Level of Service (LOS)						B		B						A		
Approach Delay (s/veh)					11.0								4.5			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	South Access/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	South Access
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						45		135			32	15		45	76	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

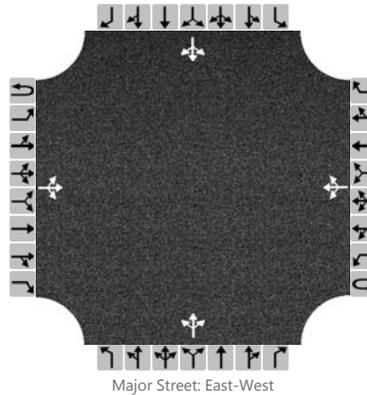
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)					50		150								134		
Capacity					733		1022								1544		
v/c Ratio					0.07		0.15								0.09		
95% Queue Length					0.2		0.5								0.1		
Control Delay (s/veh)					10.3		9.1								7.4		
Level of Service (LOS)					B		A								A		
Approach Delay (s/veh)					9.4								2.9				
Approach LOS					A												

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Sahuarita Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		31	289	4		5	666	18		36	5	26		51	4	104
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

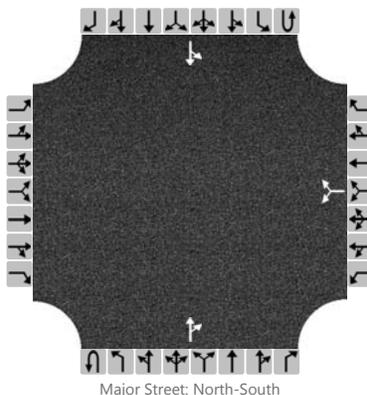
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		34				6					75					177	
Capacity		847				1228					167					260	
v/c Ratio		0.04				0.00					0.45					0.68	
95% Queue Length		0.1				0.0					2.1					4.5	
Control Delay (s/veh)		9.4				7.9					43.0					44.1	
Level of Service (LOS)		A				A					E					E	
Approach Delay (s/veh)		1.3				0.1				43.0				44.1			
Approach LOS		A				A				E				E			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Andrada Rd/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Andrada Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		4			230	5		7	395	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

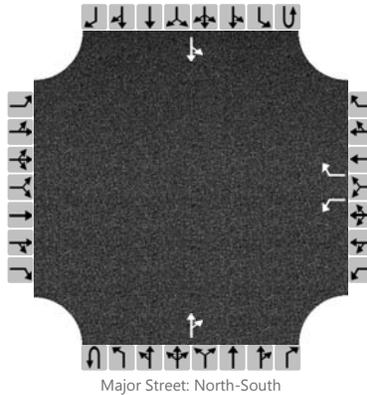
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)							10								447	
Capacity							491								1295	
v/c Ratio							0.02								0.35	
95% Queue Length							0.1								0.0	
Control Delay (s/veh)							12.5								7.8	
Level of Service (LOS)							B								A	
Approach Delay (s/veh)					12.5								0.2			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	North Access/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	North Access
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						44		134			101	75		227	173	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

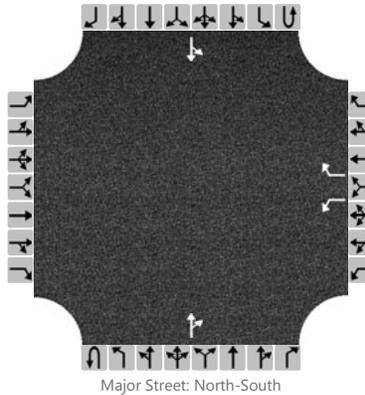
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						49		149						444		
Capacity						269		889						1370		
v/c Ratio						0.18		0.17						0.32		
95% Queue Length						0.7		0.6						0.7		
Control Delay (s/veh)						21.4		9.9						8.2		
Level of Service (LOS)						C		A						A		
Approach Delay (s/veh)					12.7								5.4			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	South Access/Wilmot Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	South Access
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	0	0	0	1	0
Configuration						L		R				TR		LT		
Volume (veh/h)						29		89			87	51		151	66	
Percent Heavy Vehicles						3		3						3		
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

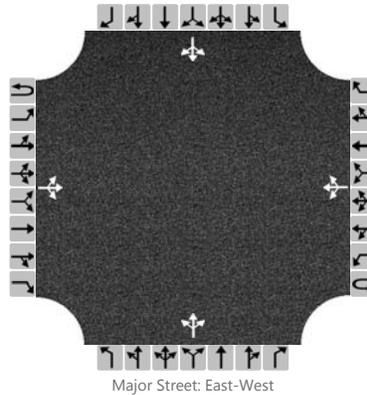
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)						32		99						241		
Capacity						445		921						1419		
v/c Ratio						0.07		0.11						0.17		
95% Queue Length						0.2		0.4						0.4		
Control Delay (s/veh)						13.7		9.4						7.9		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.4								5.8			
Approach LOS					B											

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Sahuarita Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		113	732	5		22	338	51		18	4	7		41	5	65
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Undivided															
Median Storage																

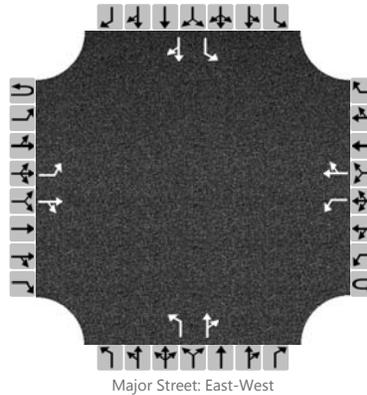
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		126				24					32					124	
Capacity		1120				805					83					155	
v/c Ratio		0.11				0.03					0.39					0.80	
95% Queue Length		0.4				0.1					1.5					5.2	
Control Delay (s/veh)		8.6				9.6					73.9					85.4	
Level of Service (LOS)		A				A					F					F	
Approach Delay (s/veh)		2.7				0.9				73.9				85.4			
Approach LOS										F				F			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Sahuarita Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 AM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	0	0	1	1	0		1	1	0		1	1	0
Configuration		L		TR		L		TR		L		TR		L		TR
Volume (veh/h)		31	289	4		5	666	18		36	5	26		51	4	104
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

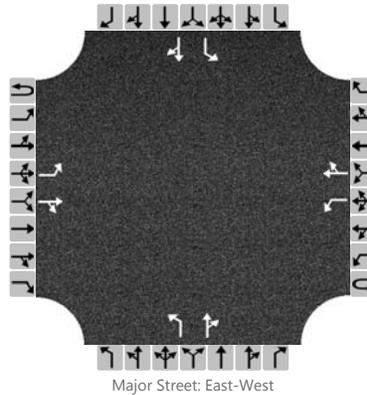
Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		34				6					40		35		57		120
Capacity		847				1228					185		568		278		405
v/c Ratio		0.04				0.00					0.22		0.06		0.21		0.30
95% Queue Length		0.1				0.0					0.8		0.2		0.8		1.2
Control Delay (s/veh)		9.4				7.9					29.7		11.8		21.3		17.6
Level of Service (LOS)		A				A					D		B		C		C
Approach Delay (s/veh)		0.9				0.1				21.4				18.8			
Approach LOS		A				A				C				C			

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	Matthew Reeg	Intersection	Wilmot Rd/Sahuarita Rd
Agency/Co.	Southwest Traffic Eng	Jurisdiction	Pima County
Date Performed	6/28/16	East/West Street	Sahuarita Road
Analysis Year	2023	North/South Street	Wilmot Road
Time Analyzed	2023 PM Peak Hour With	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Andrada Wilmot		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	1	0	0	1	1	0		1	1	0		1	1	0
Configuration		L		TR		L		TR		L		TR		L		TR
Volume (veh/h)		113	732	5		22	338	51		18	4	7		39	5	67
Percent Heavy Vehicles		3				3				3	3	3		3	3	3
Proportion Time Blocked																
Right Turn Channelized	No				No				No				No			
Median Type	Left + Thru															
Median Storage	1															

Delay, Queue Length, and Level of Service

Flow Rate (veh/h)		126				24				20		12		43		80	
Capacity		1120				805				159		282		163		545	
v/c Ratio		0.11				0.03				0.13		0.04		0.26		0.15	
95% Queue Length		0.4				0.1				0.4		0.1		1.0		0.5	
Control Delay (s/veh)		8.6				9.6				30.9		18.3		34.8		12.7	
Level of Service (LOS)		A				A				D		C		D		B	
Approach Delay (s/veh)		1.1				0.5				26.2				20.4			
Approach LOS		A				A				D				C			



**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

APPENDIX

Turn Lane Analysis

Un-Signalized Intersection (Left Turn Lane)

Location: Wilmot Road/Sahuarita Road

Approach/Leg: Eastbound

2023 With Project

V = vehicles per hour

PM Peak Hour

V = 113 vph

S = Storage = $(V * 2 \text{ min} * 25 \text{ ft/veh}) / 60 \text{ min/hr}$

$$S \text{ (ft)} = \frac{113 \text{ vph} * (2 \text{ min}) * (25 \text{ ft/veh})}{(60 \text{ min/hr})} = 94 \text{ feet}$$

Minimum Recommended Storage: 100 feet

Un-Signalized Intersection (Left Turn Lane)

Location: Wilmot Road/Sahuarita Road

Approach/Leg: Westbound

2023 With Project

V = vehicles per hour

PM Peak Hour

V = 22 vph

S = Storage = $(V * 2 \text{ min} * 25 \text{ ft/veh}) / 60 \text{ min/hr}$

$$S \text{ (ft)} = \frac{22 \text{ vph} * (2 \text{ min}) * (25 \text{ ft/veh})}{(60 \text{ min/hr})} = 18 \text{ feet}$$

Minimum Recommended Storage: 25 feet

Un-Signalized Intersection (Right Turn Lane)

Location: Wilmot Road/Sahuarita Road

Approach/Leg: Westbound

2023 With Project

V = vehicles per hour

PM Peak Hour

V = 51 vph

S = Storage = $(V * 2 \text{ min} * 25 \text{ ft/veh}) / 60 \text{ min/hr}$

$$S \text{ (ft)} = \frac{51 \text{ vph} * (2 \text{ min}) * (25 \text{ ft/veh})}{(60 \text{ min/hr})} = 43 \text{ feet}$$

Minimum Recommended Storage: 50 feet

Un-Signalized Intersection (Left Turn Lane)

Location: North Access/Wilmot Road

Approach/Leg: Southbound

2023 With Project

V = vehicles per hour

PM Peak Hour

V = 227 vph

S = Storage = $(V * 2 \text{ min} * 25 \text{ ft/veh}) / 60 \text{ min/hr}$

S (ft) = $\frac{227 \text{ vph} * (2 \text{ min}) * (25 \text{ ft/veh})}{(60 \text{ min/hr})} =$ 189 feet

Minimum Recommended Storage: 200 feet

Un-Signalized Intersection (Left Turn Lane)

Location: South Access/Wilmot Road

Approach/Leg: Southbound

2023 With Project

V = vehicles per hour

PM Peak Hour

V = 151 vph

S = Storage = $(V * 2 \text{ min} * 25 \text{ ft/veh}) / 60 \text{ min/hr}$

S (ft) = $\frac{151 \text{ vph} * (2 \text{ min}) * (25 \text{ ft/veh})}{(60 \text{ min/hr})} =$ 126 feet

Minimum Recommended Storage: 150 feet



**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

APPENDIX

Crash Analysis



PIMA COUNTY

TRANSPORTATION

TRAFFIC ENGINEERING DIVISION

WILMOT RD: 13700 - 16100 S

04/01/11 to 03/31/16

Page 1 of 1

TYPE	DATE	TIME	DAY	SEVERITY	DISTRACTED DRIVING	VIOLATIONS CITED	NARRATIVE
	CASE #	LIGHT		BLOCK #			
15	1/14/2014	16:48	Tue	PROPERTY		** VEH 1: UNKNOWN	SB HIT DIRT EMBANKMENT & ROLLED (FELL ASLEEP)
	140114214	Day		15020 S			
4	12/6/2012	17:10	Thu	PROPERTY		VEH 1: UNKNOWN	NB LOST CTRL, LEFT RDWY & ROLLED MULTIPLE TIMES (HIT & RUN)
	121206227	Day		15890 S			

LEGEND

-  REAR END
-  TURNING
-  ANGLE
-  OUT OF CONTROL
-  MISC.
-  FIXED OBJ.
-  BACKING
-  HEAD ON
-  SIDE SWIPE
-  PEDESTRIAN OR ANIMAL
-  BODILY INJURY
-  FATALITY

1
3
7
0
0
S

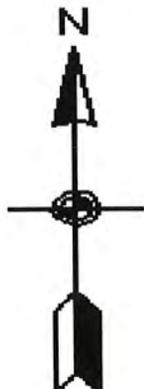
W
I
L
M
O
T
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15

(*)

CRASH AND INJURY SEVERITY SUMMARY

PROPERTY	2
INJURY	0
FATALITY	0
TOTAL	2



1
6
1
0
0
S

4





TRANSPORTATION
TRAFFIC ENGINEERING DIVISION

SAHUARITA RD @ WILMOT RD

4/1/2011 to 3/31/2016

Page 1 of 1

TYPE	DATE	TIME	DAY	SEVERITY	DISTRACTED DRIVING	VIOLATIONS CITED	NARRATIVE
	CASE #	LIGHT		BLOCK #			
5	5/11/2012	16:1	Fri	INJURY - 2		VEH 1: SPEED TOO FAST FOR CONDITIONS PASSED IN NO PASSING ZONE VEH 2: NONE	EB PASSING ON THE LEFT HIT AN EB LT
	120511276	Day		6300 E			
24	4/2/2012	00:40	Mon	PROPERTY		** VEH 1: SPEED TOO FAST FOR CONDITIONS	SB HIT A TRAFFIC SIGN IN THE MEDIAN AT THE INTERSECTION
	120402002	Dark		15800 S			

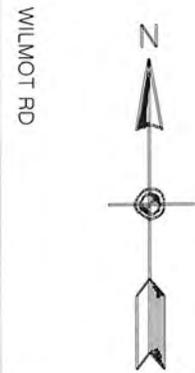

PIMA COUNTY
 TRANSPORTATION
 TRAFFIC ENGINEERING DIVISION

SAHUARITA RD@WILMOT RD
 4/1/2011 to 3/31/2016

LEGEND

-  REAR END
-  TURNING
-  ANGLE
-  OUT OF CONTROL
-  MISC
-  FIXED OBJ
-  BACKING
-  HEAD ON
- 
-  BODILY INJURY
-  FATALITY

SAHUARITA RD



5 

↓

 24

CRASH AND INJURY SEVERITY SUMMARY

PROPERTY	1
INJURY	1
FATALITY	0
TOTAL	2



**TRAFFIC IMPACT ANALYSIS
WILMOT PARK
ANDRADA ROAD/WILMOT ROAD**

APPENDIX

Comment Resolution



COMMENT AND RESOLUTION FORM

Project Name:		Wilmot Park Land Use Proposal					
Description:		TIS		Division:	Traffic Engineering	Project No:	
No.	Sheet	Staff	Comment	Response		Resolution (County Use Only)	
First Review							
Date:		8/1/2016		8/18/2016			
1		WRS	This study assumes that Red Hook won't be in development by 2023 and that it won't extend Andrada Rd to cross from Houghton Rd to Wilmot Rd.	Correct. The study does not assume that Andrada Road will connect to Houghton Road. The Hook M project is planned to improve Andrada Road going east to Houghton Road & is not connecting to Wilmot Road.			
2	3	WRS	Please include findings on right-turn lanes in the Turn Lane Calculations section.	See Table 8 in the report.			
3	6 and 11	HBO	Per the 2016 SDSS, trip distribution and assignment shall also be shown for internal roadways. A capacity analysis of the proposed internal intersection should be conducted. Is this intersection planned to be a roundabout?	The internal roadways within the project site have yet to be finalized. Capacity analysis cannot be completed at this point in time. Analysis of the key internal roadways can be accomplished at the subdivision plat stage.			
4	11	HBO	What is the traffic split between the north access and the south access?	See Figure 5 in the report.			
5	13	WRS	Is the trip assignment tied to the houses feeding into each internal road having access to only that one road?	The assignment was based on existing traffic patterns while also keeping in mind the future roadway improvements in the area. See the Trip Distribution and Assignment sections of the report for additional information.			



COMMENT AND RESOLUTION FORM

Project Name:		Wilmot Park Land Use Proposal						
Description:		TIS			Division:	Traffic Engineering	Project No:	
No.	Sheet	Staff	Comment	Response	Resolution (County Use Only)			
6	14, 15, 18 & 21	HBO	I imagine that the southbound leg of Sahuarita Rd at Wilmot Rd is shown having a shared left/right lane because of the "T" intersection signing on the south side of Sahuarita Road; this is somewhat confusing, however, since southbound through movements are included in the turning movement data. Some text could be added explaining this.	Text has been added to clarify the existing conditions section of the report to note this condition.				
7	15	HBO	The assumed 3% annual growth rate for Wilmot Road traffic is not adequate. The 2045 PAG traffic model projects a future volume of nearly 18,000 vpd on Wilmot Rd; this works out to an annual growth rate of 11%, based on the 2011 PAG volume of 513 vpd. Furthermore, paving Wilmot Rd will make it a more appealing route for commuters trying to access I-10, who now use Houghton Rd. This could drastically increase the volume of traffic on Wilmot Rd as well as the proportion of turning traffic at the Sahuarita Rd/Wilmot Rd intersection.	Growth rate has been revised to 11%. See revised report.				
8	22	HBO	Turn lane analysis should also be conducted for the Andrada Rd/Wilmot Rd and Sahuarita Rd/Wilmot Rd intersections. Also, please include the completed warrant charts either in the report or in an appendix.	The intersections have been added to the turn lane analysis.				



PIMA COUNTY
 DEPARTMENT OF TRANSPORTATION
 201 NORTH STONE AVENUE, FOURTH FLOOR
 TUCSON, ARIZONA 85701-1207



COMMENT AND RESOLUTION FORM

Project Name:		Wilmot Park Land Use Proposal						
Description:		TIS			Division:	Traffic Engineering	Project No:	
No.	Sheet	Staff	Comment	Response	Resolution (County Use Only)			
9	24	WRS & HBO	Because the Wilmot Rd project is so drastically changing the characteristics of Wilmot Rd, the past crashes do not serve as a good indicator of future safety. Please conduct a predictive crash analysis, using <i>Highway Safety Manual</i> methodologies, for the predicted future traffic volumes without the project and the future predicted traffic volumes with the project and analyze the safety impacts of the project based on these results.	The HSM provides an equation for the predicted average crash frequency for a rural two-way, two-lane roadway. Analysis was conducted to compare Wilmot Road from Sahuarita Road to Andrada Road without and with the project. See revised report.				
10	25	WRS	This traffic analysis should account for any planned adjacent developments. If none are planned, please discuss this in the report.	Discussions with Pima County Development Services revealed no developments are being planned within the project study area at this time.				
Second Review								
Date:								

**APPENDIX C:
CULTURAL RESOURCES STUDIES**

**PRELIMINARY REPORT FOR
CULTURAL RESOURCES SURVEY OF
WILMOT RD./ANDRADA RD. SEC PROJECT
NEAR TUCSON, PIMA COUNTY, ARIZONA**

Submitted to:

**Andrada Investors, LLC
2200 E. River Rd. #115
Tucson, AZ 85718**

NOT FOR AGENCY REVIEW

Submitted by

**Professional Archaeological Services of Tucson
5036 Golder Ranch Rd.
Tucson, AZ 85739-4265**

**Prepared by
David V.M. Stephen Ph.D.
Principal Investigator
State Antiquities Permit No. 2013-052bl**

P.A.S.T. Cultural Resources Report No. 132014

8/27/2013

MANAGEMENT SUMMARY & TABLE OF CONTENTS

REPORT TITLE:

Archaeological Survey Of The **Wilmot Rd./Andrada Rd. SEC** Project
Near Tucson, Pima County, Arizona Preliminary Report

REPORT DATE: 8/27/2013

INSTITUTION/CONSULTANT:

Professional Archaeological Services of Tucson (PAST)
with David V. M. Stephen, Ph.D. as principal investigator

AGENCY/LAND OWNERSHIP: Private

PERMIT NUMBER: ASM 2013-052bl

PROJECT TITLE:

Wilmot Rd./Andrada Rd. SEC Archaeological Survey, PAST No. 132014

PROJECT DESCRIPTION:

Systematic survey to determine the extent of cultural resources on lands that had either not undergone a complete, intensive archaeological survey or sufficient time had passed since an earlier study suggesting cultural resources may now be exposed that would not have been documented by the initial field work.

PROJECT LOCATION:

Within NW4 & NE4 & S2 SW4 section 6 T17S R15E G&SRB&M near, Tucson, AZ. 182 acres

DATES OF FIELDWORK/PERSON-DAYS EXPENDED:

August 1, 2 & 3, 2013, 3 person-field day

REGISTER-ELIGIBLE SITES: NONE

INELIGIBLE SITES: PAST1

CURATION FACILITY: NA

(Please See Following Form For Additional Information Keyed to ASM/SHPO Report Sections (D1 through D11))

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P.A.S.T. ABSTRACT & PROJECT SUMMARY FORM

P.A.S.T. JOB NO. 132014

SUMMARY. An on-foot cultural resources survey of Private property (182 acres) near Tucson in Pima County identified cultural resources PAST1. Based on the fieldwork and archival documentation, further cultural resource studies may not be warranted on the property because the information potential of the site will be exhausted when the site formally recorded with the Arizona State Museum.

INTRODUCTION						
(D1)	Preliminary Report for Cultural Resources Survey Of Wilmot Rd./Andrada Rd. SEC Project Near Tucson, Pima County, AZ.					(D2) 8/27/2013
(D3) Agency Name:						
(D4) ASM Permit No.	2013-052bl	Other Permits:	NA			
(D5) Project Description:	The land is slated for residential development.					
(D6) Agency Reference:						
Project Sponsor:	Andrada Investors, LLC					
(D7) PROJECT LOCATION INFORMATION (see also attached copy of USGS map)						
County:	Pima	Vicinity of	Tucson	AZ		
Legal:	NW4 & NE4 & S2 SW4 Sec. 6 T17S R15E G&SRB&M					
AZ QUAD	USGS MAP NAME	MAP SCALE				
1. EE:1 NE	Corona de Tucson	7.5'				
(D8) SURVEY INFORMATION						
Type:	Non-collection on-foot survey with systematic 20m transects or equal			Person-days	3	
182 acres AND/OR 0 miles long BY 0 foot wide right-of-way			Percent surveyed	100%		
Land Ownership	Private					
Field Crew	D. Stephen, B. Wright, J. Haller		Project Director:	David Stephen		
Field Work Dates	August 1, 2, & 3, 2013		Ground visibility was effected	moderately		
Additional Survey Records Submitted:	None		Artifact Collections Submitted to ASM:	None		
(D9-10) CULTURAL RESOURCES WITHIN PROJECT AREA (see report narrative for additional information)						
Archives Researched:	ASM/AZSITE <input checked="" type="checkbox"/>	GLO <input checked="" type="checkbox"/>	SHPO <input type="checkbox"/>	MNA <input type="checkbox"/>	Other:	
Numbers of eligible sites	NA		Numbers of ineligible sites	PAST1		
Previously recorded sites	NONE		New sites found this project	PAST1		
Artifact scatters	NA		Total sites	1		
Sites within 160 meters	AZ EE:1:157 (ASM)	Isolate density/total artifacts	<1 per acre	31		
Sites in 1.6 km radius	Other than those noted above, 13 sites in the general area					
Ref. No. of Prior Surveys	None with study area, 5 ROW surveys along boundaries					
(D11) RECOMMENDATIONS FOR FURTHER WORK (see also comments below)						
FURTHER WORK RECOMMENDED	NONE <input type="checkbox"/>		OR			
SITE RECORDING <input checked="" type="checkbox"/>	MONITORING <input type="checkbox"/>	SUB-SURFACE TESTING <input type="checkbox"/>	DATA RECOVERY <input type="checkbox"/>			
COMMENTS (see report narrative additional information)						
The quantity of artifacts within the subject property and data about known sites suggests the undertaking will impact no important cultural resources. The information potential of the cultural resources encountered have been exhausted through the recordation activities.						
Form Completed By	David Stephen		Form Rev. 1/02	Date	8/27/2013	

**Cultural Resources Survey Of
Wilmot Rd./Andrada Rd. SEC Project
Near Tucson, Pima County, Arizona
PRELIMINARY REPORT
PAST No. 132014**

Introduction.

Personnel from P.A.S.T. reviewed field and archival information for a 3 person-day, survey of the Wilmot Rd./Andrada Rd. SEC property conducted on August 1, 2, & 3, 2013 located in Pima County near Tucson in anticipation of residential development. The purpose of the project was to determine whether any significant cultural resources that might be adversely impacted by construction were present. The project sponsor (Andrada Investors, LLC) initiated this study in accordance with municipal requirements. P.A.S.T. holds permit 2013-052bl issued under the Arizona Antiquities Act through the Arizona State Museum.

Project Location.

The approximately 182 acre project area is located in the eastern portion of the Tucson Basin (Figure 1). The location with respect to the Public Land Survey is within the NW4 & NE4 & S2 SW4 of Section 6 T17S R15E G&SRB&M. The project area is located on the Corona de Tucson United States Geological Survey 7.5' map. The UTM values for selected boundary points are shown on the map to indicate the extent of the parcel. The boundary shown on the map is reasonably accurate given the limitations of a 1:24,000 scale map. It is based on data and maps provided by the client as well as field observations but it is not intended to represent the precise legal extent of the parcel. Unless otherwise noted, land ownership coincides with the parcel and survey boundary shown in Figure 1. The fieldwork was conducted on private lands.

Base Maps Included In Report

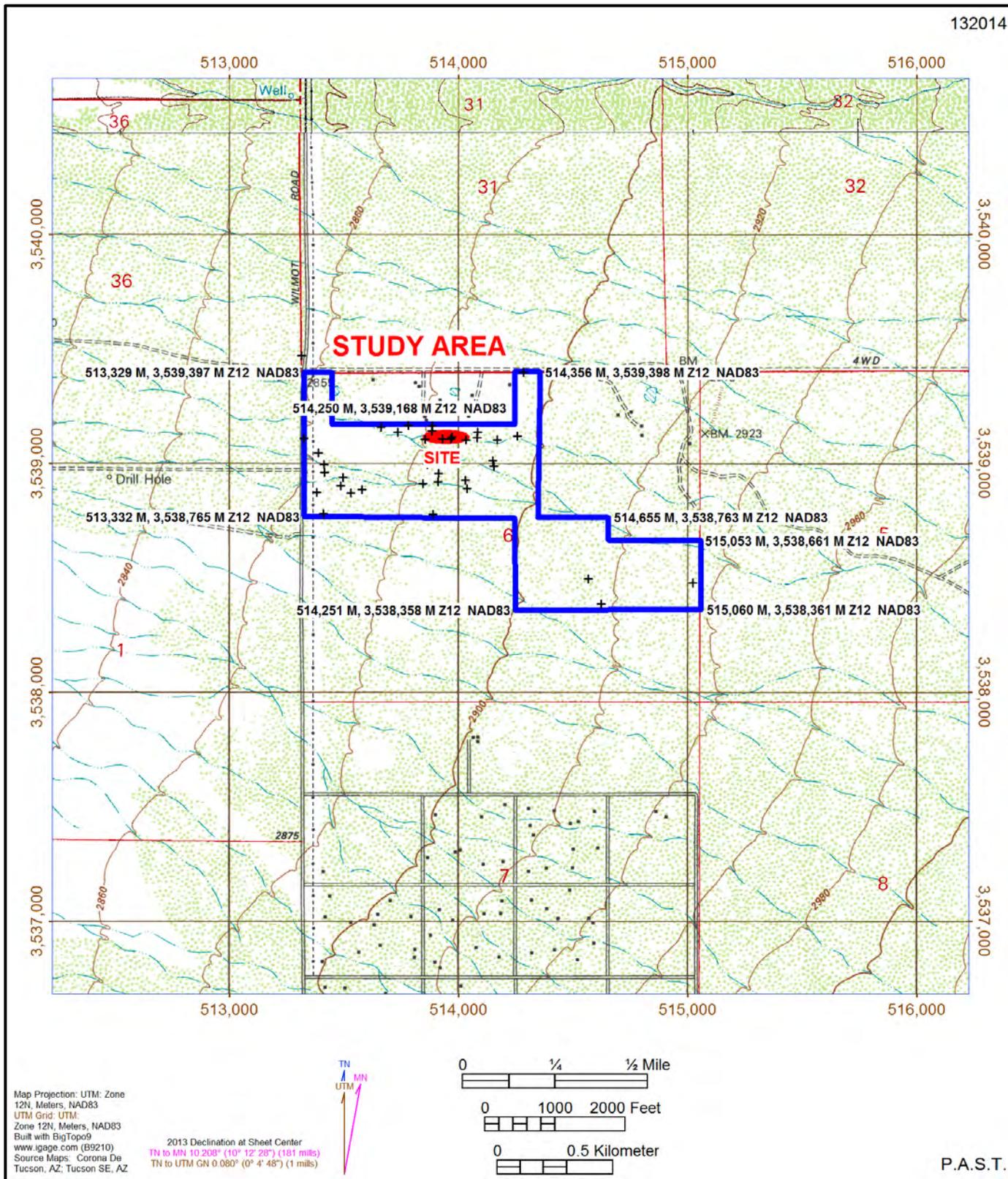
Figure 1 is a copy of a portion of the U.S.G.S. Corona de Tucson 7.5-minute topographic map that shows the project boundaries, archaeological sites within the project area, and all isolated artifacts and features found during the survey. Table A-1, located at the end of the report, provides coordinate and other information for these isolates. Projects with boundaries extending across multiple U.S.G.S. maps are so noted on page ii and in the lower left of Figure 1. Figure 2 is a site map depicting the site boundary, natural features and major elements of the site as appropriate.

BACKGROUND TO STUDY AREA:

Effective Environment.

The study area is within the Basin and Range physiographic province at an approximate elevation of 2,902 feet. Project area vegetation is typical of the Arizona Upland subdivision of the Sonoran Desertscrub biotic province (Turner and Brown 1982) predominately comprised of creosote, mesquite, cholla, semi-shrubs and annual grasses.

Figure 1. Corona de Tucson U.S.G.S. 7.5' MAP (T17S R15E)



NOTE: Due to the sensitivity of site locations, only sites within the project area are depicted on the map
 Site and study area locations as well as their geometric representation and extent are approximate. + = isolate.

Culture History.

The antiquity laws apply to human cultural remains in excess of 50 years of age and require them to be assessed as to their potential for yielding important information. Consequently, sites and artifacts dating from the mid twentieth century and earlier must be evaluated.

The Historical Period. This period commenced in roughly 1700 is comprised of the Spanish, Mexican and Anglo occupations with some researchers recognizing the protohistoric as a transitional culture from the earlier prehistoric occupations. The prehistoric peoples who lived in this region include the Hohokam, Archaic and Paleoindian cultures.

The Hohokam (A.D. 450 - 1450). The Hohokam were a sedentary, agriculture-based people who produced both plain and decorated pottery, along with numerous other crafts of shell, stone and clay. They were skillful agriculturists who lived in houses built in shallow pits and constructed extensive irrigation canal systems. In some of the larger villages, they built ballcourts that probably served as focal points for ceremonial or recreational activities. Whether the Hohokam migrated into the region from Mexico or developed from indigenous Archaic populations is still hotly debated. The Hohokam cultural sequence was established in the 1930s based on the decorated pottery types unearthed at the Snaketown Site in the Phoenix Basin. Shortly thereafter, Isabel Kelly modified this chronology to fit the Tucson Basin sequence after her excavations at the Hodges Ruin in Tucson. Since that time, the continual acquisition of new archaeological data has brought about many refinements in the chronology.

Archaic Era (7500 B.C. - A.D. 450). The Archaic era has traditionally been characterized by assemblages of chipped stone artifacts along with ground stone tools for processing plant materials, and a lack of ceramics. Recent research in the Tucson Basin and elsewhere has demonstrated the presence of pit house villages, agriculture and some ceramics in the Late Archaic. The shift from a hunting-based economy to a reliance on plant foraging and small-game hunting that characterized the Archaic sites was caused by the extinction of Pleistocene mammals favored by the Paleoindians.

Paleo-Indian Era (ca. 10,000 - 7500 B.C.). Eleven thousand years ago, the climate in the Southwestern United States was considerably wetter and cooler than it is today, and much of the terrain consisted of lush grasslands that supported herds of mammoth, bison and other large grazing animals. Many of the earliest occupants of the area, known as Paleoindians, were hunters who subsisted on these large, late Pleistocene mammals. The belief that many of the Paleoindians were primarily big-game hunters is supported by the fact that most of the Paleo-Indian sites that have been excavated have been kill and butchering sites. The artifact assemblages from these sites are made up of projectile points and other stone tools suitable for skinning animals and cutting meat and bone. The earliest Paleo-Indian artifacts found in southern Arizona belong to the Clovis complex (9500-9000 B.C.), which is characterized by long, lanceolate, fluted Clovis points, along with other stone implements and bone artifacts.

Arizona State Museum Site Definition Standard (ASM 1993).

The determination of what constitutes an archaeological site is, to a certain extent, a matter of professional judgment. However, if certain minimal archaeological discoveries (listed below) are encountered, then an ASM site card must be completed and submitted. In other words, if the archaeological discoveries exceed the minimum criteria listed below, a site card must be filled out. Sites that do not meet the minimum standards, but which the archaeologist deems worthy of site status, may also be assigned ASM numbers

Most archaeologists define sites based on consideration of age of remains as well as density and diversity of artifacts and features and the spatial arrangements of these remains within the area under consideration. The following guidelines should be used to define archaeological sites:

All sites should contain:

1. physical remains of past human activity that are at least 50 years old.

Additionally, sites should consist of at least one of the following:

2. 30+ artifacts of a single class (i.e., 30 sherds, 30 lithics, 30 tin cans) within an area 15 meters (50 feet) in diameter, except when all pieces appear to originate from a single source (i.e., one ceramic pot, one core, one glass bottle).
3. 20+ artifacts which include at least 2 classes of artifact types (i.e., sherds, groundstone, nails, glass) within an area 15 meters (50 feet) in diameter,
4. one or more archaeological features in temporal association with any number of artifacts.
5. two or more temporally associated archaeological features without artifacts.

Non-linear, isolated features without associated artifacts may be recorded. An "isolated feature" is defined as a feature that does not have any other features within a 100 meter (325 feet) diameter. This might include isolated rock piles, mine shafts, prospecting pits or unidentified depressions without artifact associations.

Evaluation of Cultural Resources.

Although archaeological and historical sites may qualify for formal recording under state standards, they generally are not considered significant unless they are eligible for listing in the Arizona or National Register of Historic Places. According to the current standards a property must possess sufficient integrity, significance and antiquity to be listed in the Register. In addition to being at least 50 years of age a resource must meet the criteria set forth below:

The quality of *significance* in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- B) that are associated with the lives of persons significant in our past; or

- C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D) that have yielded, or may be likely to yield, information important in prehistory or history (National Park Service 1986)

ARCHAEOLOGICAL SURVEY:

Survey Expectations.

This project's study area was located in a portion of southern Arizona that is conducive to prehistoric and/or historical settlement. Therefore, it was considered a reasonable likelihood that prehistoric or historical sites would be found during the survey.

Records Review.

A review of the records of the Arizona State Museum ,, in anticipation of the survey, revealed that the subject parcel had either not undergone a complete, intensive archaeological survey or sufficient time had passed since an earlier study suggesting heretofore undiscovered cultural resources may have been subsequently exposed that would not have been documented by any earlier field work. The ASM records, as well as the other archives indicated on the associated project form, revealed no recorded cultural resources on the inspected parcel. GLO surveyor's maps (Averill 1930) showed no cultural features for T17S R15E G&SRB&M in the vicinity of Section 6 nor does the 1904 1:125,000 or 1957 1:62,500 Tucson quadrangle maps. Previously recorded cultural resources within a 160-meter perimeter around the project boundary are noted in the summary form since such resources could be impacted by the project and may account for the presence of isolated non-site cultural entities found on the parcel. Recorded cultural resources within a 1.6-kilometer radius of the center of the project area are listed on the project summary form and in Table A-2. There no previous surveys documented within the study area.

Methods.

The original fieldwork consisted of intensive on-foot coverage of the property in order to identify and locate any cultural resources, historic or prehistoric, within the property boundaries (cite). Field personnel walked transects approximately 20 meters apart and crossed the subject property in a series of contiguous corridors with any areas of extreme slope covered less intensively. Survey transects paralleled the longest dimension of the property except when prevented by the landform, vegetation density or hydrological features. Unless noted otherwise, the transect count is the quotient of the transect extent and parcel width. General conditions were excellent for conducting the fieldwork. Ground visibility was moderately affected by the presence of trees, shrubs, semi-shrubs, succulents and grasses. The original landform was moderately disturbed by modern alterations to the ground surface.

Survey Results.

The information derived from the fieldwork is generally in keeping with the expectations generated from archival and literature sources. Part of the project area fell within the site boundary of PAST1. Nominally there were sufficient surface indications of archaeological materials on the property to meet the Arizona State Museum minimum

standard for recording as an archaeological site.

Site description for PAST1. The cultural resource is a dispersed scatter of historical period artifacts from the first quarter of the 20th century over a 250 foot area that meet the ASM site definition standard. A complete description will follow in the final report after a site number has been assigned..

Vicinity Sites, Isolates and Modern Features.

Vicinity Sites. Cultural resources that are located close to the study area (within roughly 160 meters or 0.10 miles perimeter) are considered vicinity sites and are noted in the relevant tables and discussed when appropriate in this section. Recorded sites further away but in the general area (within a one-mile perimeter) are summarized in the relevant tables (see PAST Summary Form and Appendix Table A-2a for site numbers). According to AZSITE there is one site located within the 160 meter perimeter.

Isolates. The occurrence of isolated artifacts and non-site features in lower density than that required for formal recording as a cultural resource are documented below, in Figure 1 or in Table A-1 as appropriate. For this project a total of 31 isolated artifacts or non-site features were noted and none deemed significant.

Modern Features. More recent cultural manifestations identified during the survey include dirt tracks, informal trails and a light scatter of trash. All appear to be modern in origin.

Significance Assessment.

Archaeological site PAST1 could qualify for National Register listing under criterion "A" (cited above) based on events associable to broad patterns in history or "D" if it could provide new data important in prehistory or history . In order for a site to provide new cultural information about the cultural group who made and used it, it would need to retain some of its original integrity and be associable with a specific period of prehistory or history. The surface of the site has obviously been subjected to ongoing disturbances making it unclear as to whether or not the artifacts present retain any of their original or primary context thereby making temporal associations problematic. The nature of the site and lack of depth to the deposits make it unlikely that the site retains sufficient physical integrity to yield meaningful information beyond that which was gathered during the recordation process.

In summary, archaeological site PAST1 contained archaeological materials that met the A.S.M. site definition standard criteria but currently do not appear to have the potential to yield information beyond that which was derived from the original recording and documentation of these resources.

Eligibility Evaluation.

Since the site has been recorded, and no important information can be obtained through further studies, P.A.S.T. recommends that PAST1 not be considered significant under Criterion D listed above.

Evaluation Of Effects Of The Proposed Project.

Considering the nature of the cultural resources found on the property and the work already completed, the development of the inspected parcel will not have an effect on potentially significant cultural resources.

Recommendations.

Based on the archival information, field methods, the observable surface indications and because none of the materials observed on the subject property have potential to provide important archaeological or historical information beyond what has been already obtained for these resources, P.A.S.T. supports approving the sponsor's application. Although P.A.S.T. does not endorse additional archaeological studies for this project, ground-disturbing activities on the property should not commence without authorization by the agency archaeologist(s).

There remains the possibility that ground-disturbing activities could reveal the presence of heretofore undiscovered cultural resources. If such materials are discovered construction activities should stop. Consultation should be initiated with the appropriate agency archaeologist, and if applicable under ARS §41-841 *et seq.* the Arizona State Museum, to assess the potential significance of any materials unearthed. Under State law (ARS 41-§865 & §41-844) if human skeletal remains or funerary objects are discovered on either public or private lands the Arizona State Museum should be contacted immediately.

LITERATURE CITED

Arizona State Museum

1993 *Arizona State Museum Archaeological Site Recording Manual (Version 1.1)*. On file, Arizona State Museum. Tucson, Arizona.

Averill, D.

1930 GLO Surveyor's Map for T17S 15E G&SRB&M. On file, Bureau of Land Management Regional Office. Phoenix, Arizona

National Park Service

1986 *How to Apply the National Register Criteria for Evaluation*. Department of the Interior. Copies available from Bulletin No. 16. National Register of Historic Places.

Turner, R. and D. Brown

1982 Sonoran Desertscrub. In *Biotic Communities of the American Southwest - United States and Mexico*, edited by D. Brown, pp. 118-121. University of Arizona for Boyce Thompson Southwestern Arboretum, Superior, Arizona.

NOTICES and DISCLOSURES

NOTE FOR A.D.O.T. INVOLVED PROJECTS: If previously unidentified cultural resources are encountered during activity related to the use of this source, the contractor shall stop work immediately at that location and shall take all reasonable steps to secure the preservation of those resources. The Engineer will contact the A.D.O.T. Environmental Planning Group, Historic Preservation Team at 602.712.7767 and make arrangements for the proper treatment of those resources.

INFORMATION DISCLOSURE NOTICE: P.A.S.T. is a holder of an Arizona Antiquity Permit and a signatory to the "ASM Archaeological Records Use Agreement". As such, in compliance with the associated conditions and regulations of these documents, P.A.S.T. is bound "not to distribute or disclose specific site location information in a public document or make this information available to unauthorized individuals". P.A.S.T. reports are often initiated through third parties, who are not authorized to access this information. Consequently such information is presented herein in a manner deemed appropriate not to compromise site location or divulge potentially identifying site attribute information. P.A.S.T. reports are further structured to restrict the dissemination of such information through the removal of Appendix "A" as well as any maps of archaeological sites included in the document prior to wider distribution of the report.

P.A.S.T. will readily provide further or more specific site location, eligibility or site attribute information to a qualified individual when that person makes a request in writing or via email directly to P.A.S.T. That request must be supported with written concurrence from the agency lead archaeologist and either the SHPO, Director of the Arizona State Museum or their authorized designee(s) if the requestor does not hold a valid Arizona Antiquity Permit or has not executed the aforementioned ASM records use agreement.

PENDING ISSUANCE OF ASM SITE NUMBER

**APPENDIX D:
PRELIMINARY WATER INFRASTRUCTURE MASTER PLAN**

TECHNICAL MEMORANDUM

Prepared for: Robert Tucker, Andrada-Wilmot 180, LLC

Prepared by: Lauren R. Hixson, P.E., WestLand Resources, Inc.

cc: Mark Weinberg, Diamond Ventures
Mark F. Taylor, P.E., WestLand Resources, Inc.
William B. Carrol, P.E., Engineering and Environmental Consultants, Inc.
Buck Schmidt, BasinWells Associates, PLLC

Date: June 22, 2016

Project No.: **ANDRADA 365 ACRES PRELIMINARY INTEGRATED WATER
MANAGEMENT PLAN
WESTLAND PROJECT NO. 1039.13**

WestLand Resources, Inc. (WestLand) has prepared this Preliminary Integrated Water Management Plan (PIWMP) for the Andrada 365 Acres development (Andrada 365) in accordance with the Pima County Comprehensive Plan Water Resources Element (C07-07-04; Resolution 2008-72). The PIWMP is in support of a rezoning proposal of the 365 acre parcel located southeast of the intersection of Andrada Road and Wilmot Road in Township 17 South, Range 15 East Section 6 in Pima County, Arizona.

I. WATER CONTEXT MAP

Exhibits 1A through **1C** provide the required information for the water concept map including the following:

- Aerial photo
- Sectional breakout and Pima County parcel numbers
- Roads
- Proposed Certificates of Convenience and Necessity Boundaries
- Water Service/CC&N Boundaries of adjacent water providers
- Recharge areas including major washes and artificial recharge areas. Also shown is the Corona de Tucson Wastewater Treatment facility. This facility is up-gradient of Andrada 365 and is currently recharging effluent to the aquifer.
- Reclaimed Water infrastructure – Reclaimed Water Mains greater than 16-inch shown per Tucson Water Reclaimed Water System 2014 map
(https://www.tucsonaz.gov/files/water/docs/2014_RECLAIMED_MAP.pdf)

- Areas where trends indicate groundwater levels are rising. This information is from the Arizona Department of Water Resources (ADWR) Water Atlas for the Tucson Active Management Area (AMA).

2. BRIEF DESCRIPTION OF PROPERTY'S EXISTING AND HISTORIC WATER USE

The property is undeveloped land.

3. DESCRIPTION OF PROPERTY'S PROPOSED WATER USE

The 365 acre property will be developed into a residential subdivision consisting of 800 residential lots. Water will be used to provide potable water to these residences as well as approximately 10 acres of low water use landscaping along the roadway right of way.

4. DESCRIPTION OF WATER SUPPLY OPTIONS AND PROPOSED METHOD OF DELIVERY

The property is currently outside of an existing Municipal provider's service area but will be served by the extension of the service area of a non-adjacent service provider. The existing water provider, Red Rock Utilities, plans to expand its Certificate of Convenience and Necessity (CC&N) to include the Andrada 365 property (**Attachment A**). Andrada 365 will be served by a reservoir located on the nearby Hook M Ranch (Hook M) development parcels that will serve both Hook M and the Andrada 365 development. Wells to serve both project properties may be located on the Andrada 365 property and/or on the Hook M property. Only one well will be constructed, as needed, on the Andrada 365 property. A booster station will be constructed on the Hook M property to serve the Hook M development. Hook M Ranch will also be included in the expansion of Red Rock Utilities CC&N boundaries. The current Red Rock Utilities CC&N boundaries and the proposed CC&N boundaries for Andrada 365 and Hook M are included on **Exhibit 4**.

5. WATER DEMAND PROJECTIONS

Water demand projections were calculated using the ADWR Project Demand Calculator (**Attachment B**). This calculator takes into account large lot adjustments, irrigation demands, system losses, and construction water. The calculated projected water demand is 276.88 acre-feet per year. The following assumptions were used in the calculator:

- 2.2 persons per dwelling unit
- 800 single family lots
- 40 – one acre lots
- 10 acres of low water use irrigated right-of-way

Based on the Estimated Baseline Water Demand for Residential Land Use provided in Table A, the residential demand for Andrada 365 is 272 acre-feet per year. This is based on the proposed CR-5 zoning designation and a single family annual demand per home of 0.34 acre-feet.

The selected Water Conservation Measures from the provided table for the project are provided in **Attachment C**.

6. PROXIMITY TO RENEWABLE AND POTABLE WATER SUPPLIES

Groundwater wells will be used to serve the Andrada 365 development. As part of the ADWR Certificate of Assured Water Supply application and approval, the land will be registered with the Central Arizona Groundwater Replenishment District (CAGRDR). The CAGRDR will replenish the groundwater used by Andrada 365. In addition to membership with CAGRDR, the development is down-gradient from the Corona de Tucson Wastewater Treatment facility which is actively recharging effluent. Wastewater from Andrada 365 will be treated by this facility and recharged to the aquifer. It is estimated that approximately 20% of the total water used by Andrada 365 will be recharged to the aquifer.

Adjacent water providers to the property are shown on **Exhibit 5**. Tucson Water's obligated service area is to the north of the property, however this area is not currently served. Tucson Water was previously contacted to inquire about service to the Hook M Ranch development, but they did not have any plans to provide service (**Attachment D**).

7. GROUNDWATER DEPENDENT ECOSYSTEMS

There are no groundwater-dependent ecosystems located within a five mile radius of the Andrada 365 development.

8. GROUNDWATER DEPTH AND TRENDS

Groundwater depths for Groundwater Site Inventory Wells (GWSI) wells surrounding the Andrada 365 development are shown on **Exhibit 7**. This information was downloaded from the ADWR GIS Data and Maps on May 31, 2016. Depth to groundwater adjacent to the property ranges from approximately 245 feet below land surface (bls) to the west to 311 feet bls immediately north of the property. Generally, depth to groundwater decreases northwest of the property and increases to the east of the property. **Exhibit 8** shows the general trend of groundwater in the wells surrounding the property. Water level in these wells is shown as either increasing (depth to groundwater is decreasing), decreasing (depth to groundwater is increasing), or stable. Water levels are generally increasing to the west of the property and decreasing to the east. Hydrographs from ADWR for the GWSI wells in the

vicinity are provided with **Exhibit 8** showing the groundwater depth and trend since the level has been monitored.

9. GEOLOGIC AND HYDROGEOLOGIC DATA

BasinWells Associates, PLLC (BasinWells) is preparing a hydrology report for Andrada 365 that describes the geologic and hydrogeologic conditions surrounding the Andrada 365 development. Per BasinWells, the hydrogeologic conditions of the area consist of an alluvial aquifer system. The basin-fill alluvium is made up of five sedimentary units including the lower, middle, an upper Tinaja beds, the Fort Lowell formation, and the young alluvium. The Fort Lowell formation and the upper Tinaja beds make up the aquifer underlying the Andrada 365 development.

Hydrogeologic soil types, provided by the Pima County Mapguide Map, in the vicinity of the development are shown on **Exhibit 9**. The bedrock of the Santa Rita Mountains bounds the aquifer system to the southeast. The Santa Rita bedrock is located approximately five miles southeast of the development. The Santa Rita bedrock and depth to bedrock near the property are shown on **Exhibit 10**. The source of the location of hydrogeologic bedrock is Pima County Mapguide Map and the source for the depth to bedrock is the Arizona Geologic Survey shape file (http://repository.azgs.az.gov/uri_gin/azgs/dlio/584).

The proposed wells that will serve Andrada 365 are located outside of fissure and subsidence areas. Locations of earth fissures are shown on **Exhibit 11** per the Arizona Geological Survey Earth Fissure Planning Map. Locations of subsidence are shown on **Exhibits 12A** through **12E**. **Exhibit 12A** is based on satellite data from ADWR whereas the information in **Exhibits 12B** through **12E** are based on monitoring stations. The satellite data is preferred since it provides coverage across an entire area rather than interpolated data between monitoring stations.

10. AREA WATER SUPPLY

Existing wells within one mile of the property's boundary as well as proposed wells that will serve the property are shown on **Exhibit 13**.

11. WELL TEST DATA

No wells have been drilled for the project to date.

12. DRAWDOWN ANALYSIS

A drawdown analysis was performed for a proposed well, Well No. 1, located on the Andrada 365 property as part of the Analysis of Assured Water Supply hydrology report being prepared by BasinWells. An AquiferWin32™ analytical groundwater model was developed by Environmental

Simulations, Inc. using hydraulic parameters of the ADWR 3D model of the Tucson Active Management Area (TAMA). The drawdown analysis was performed based on pumping the estimated annual demand of 276.88 acre feet per year (equivalent to approximately 172 gallons per minute (gpm)) twenty-four hours a day for 100 years. The following parameters were used in the analytical model:

- Specific yield/storage coefficient of .12
- Aquifer saturated thickness of 600 feet
- Aquifer transmissivity of 16,830 gallons per day per foot
- One well pumping continuously at a rate of 172 gpm

The results of the analytical model showed a maximum water level drawdown of approximately 12 feet at the on-site well. A drawdown contour map for the well and the output file for the AquiferWin32™ analytical groundwater model are provided in **Attachment E**. A 5-year model was not performed, given that the well will not cause drawdowns greater than 10 feet in any surrounding wells of record after 100 years of continuous pumping.

13. REFERENCES

BasinWells Associates, PLLC. *Hydrology Report, Andrada 365 Development, Tucson, Arizona, Investigation of Assured Water Supply*. (No date yet).

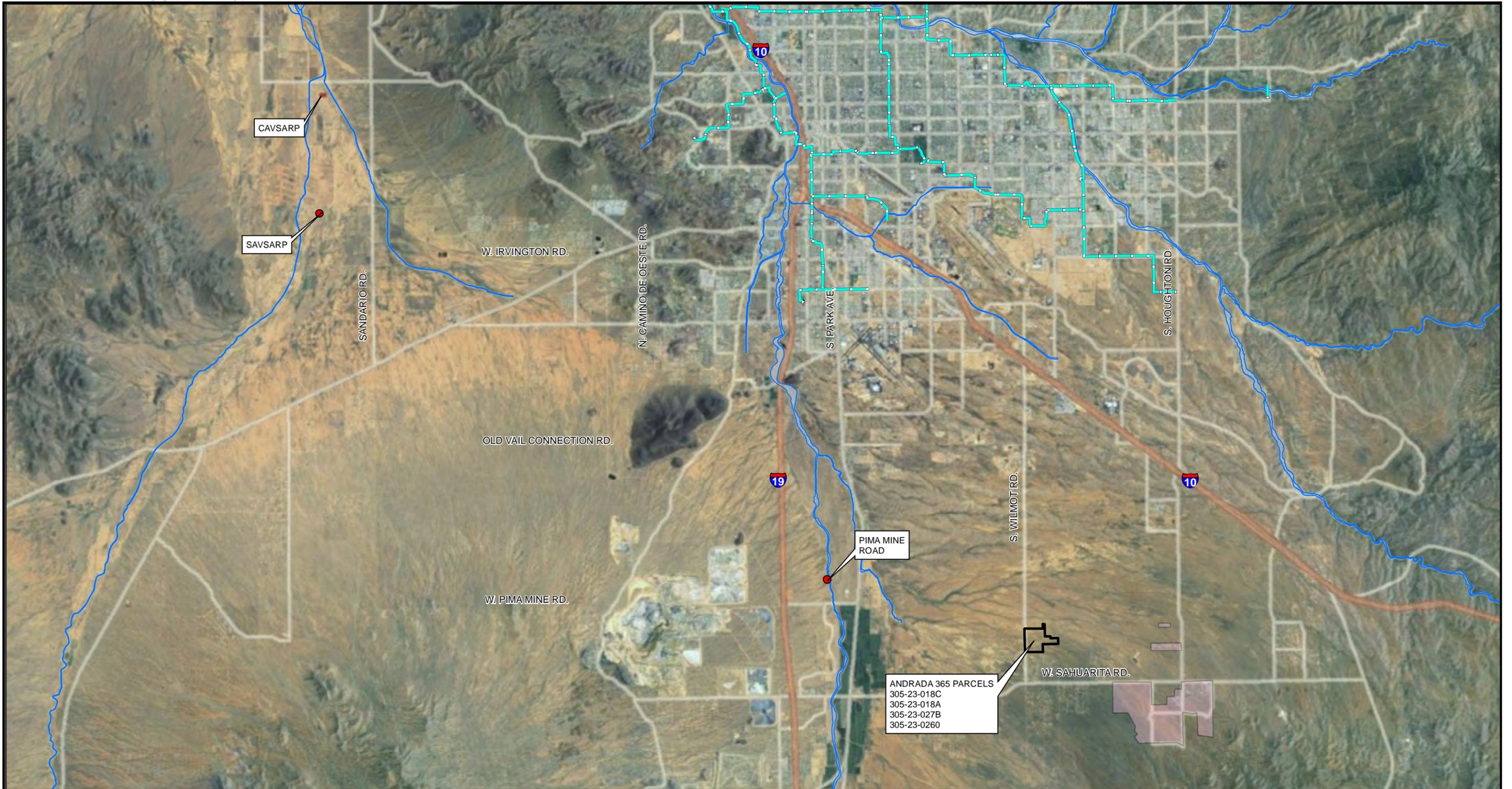
Pima County. Development Services. *Rezoning Application and Site Analysis Requirements*. Accessed June 20, 2016.

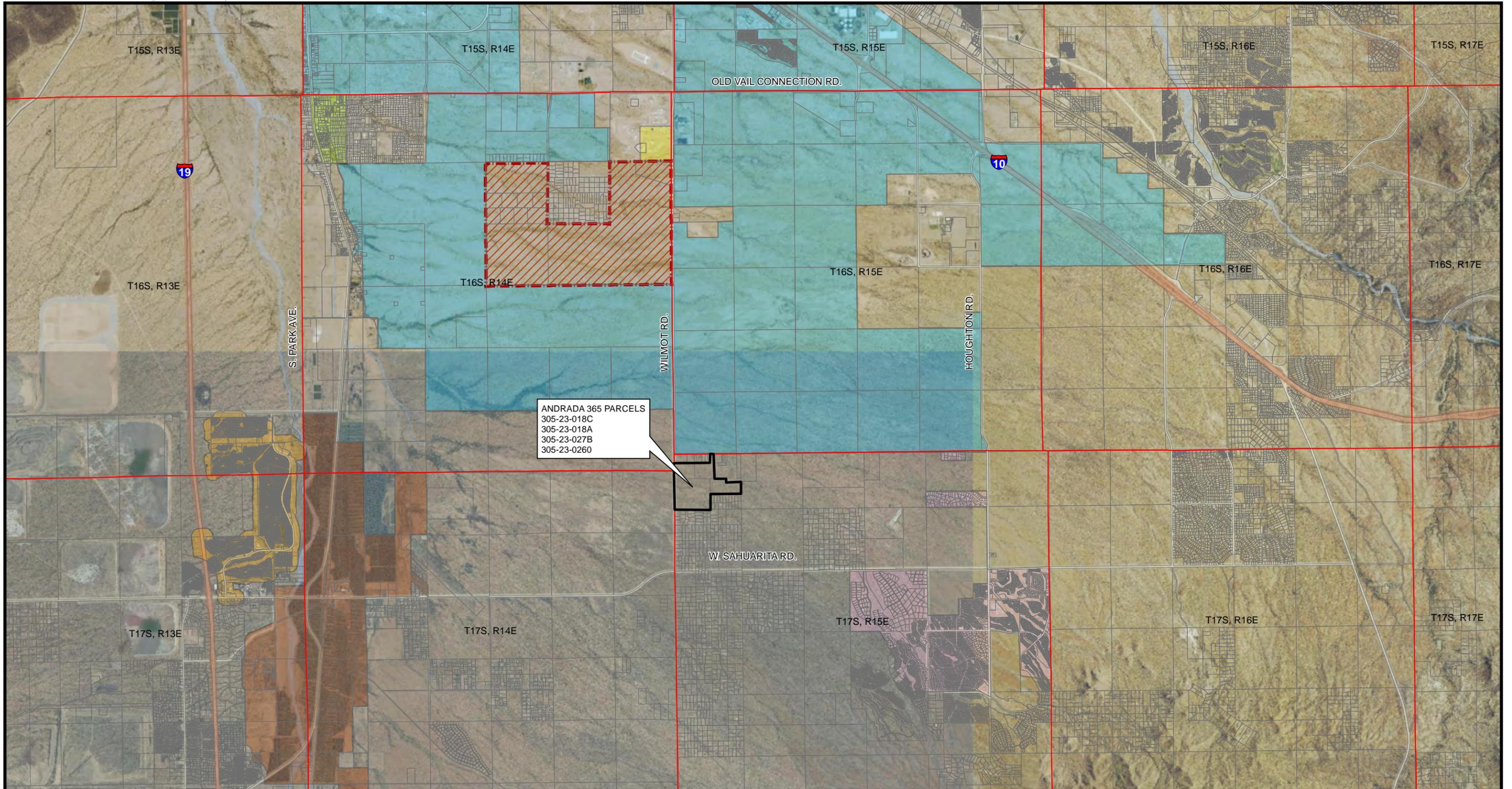
https://webcms.pima.gov/UserFiles/Servers/Server_6/File/Government/Development Services/Land Planning and Regulation/Current Planning Tab/Site Analysis Rezoning Packet 3.12.16.pdf.

List of Exhibits and Attachments

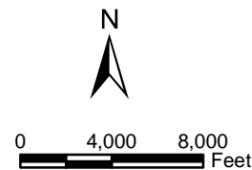
- Exhibits:
- 1A – Regional Water Context Map
 - 1B – Local Water Context Map
 - 1C – Regional Water Level Trends
 - 4 – Proposed Water Supply
 - 5 – Water Service Providers
 - 7 – Groundwater Depths
 - 8 – Ground water Trends
 - 9 – Hydrogeologic Soil Type
 - 10 – Location of Hydrogeologic bedrock
 - 11 – Mapped Earth Fissures
 - 12A – Land Subsidence Pima County
 - 12B – Land-surface elevation change in the TAMA from 1987-1998
 - 12C - Land-surface elevation change in the TAMA from 1998-2002
 - 12D - Land-surface elevation change in the TAMA from 2002-2005
 - 12E - Land-surface elevation change in the TAMA from 1987 to 2004 and 2005
 - 13 – Area Water Supply
- Attachments:
- A – Red Rock Will Serve Letter
 - B – ADWR Demand Calculator
 - C – Water Conservation Measure
 - D – Tucson Water Letter
 - E - Drawdown Contour Map and Groundwater Model Output

EXHIBITS





ANDRADA 365 PARCELS
 305-23-018C
 305-23-018A
 305-23-027B
 305-23-0260

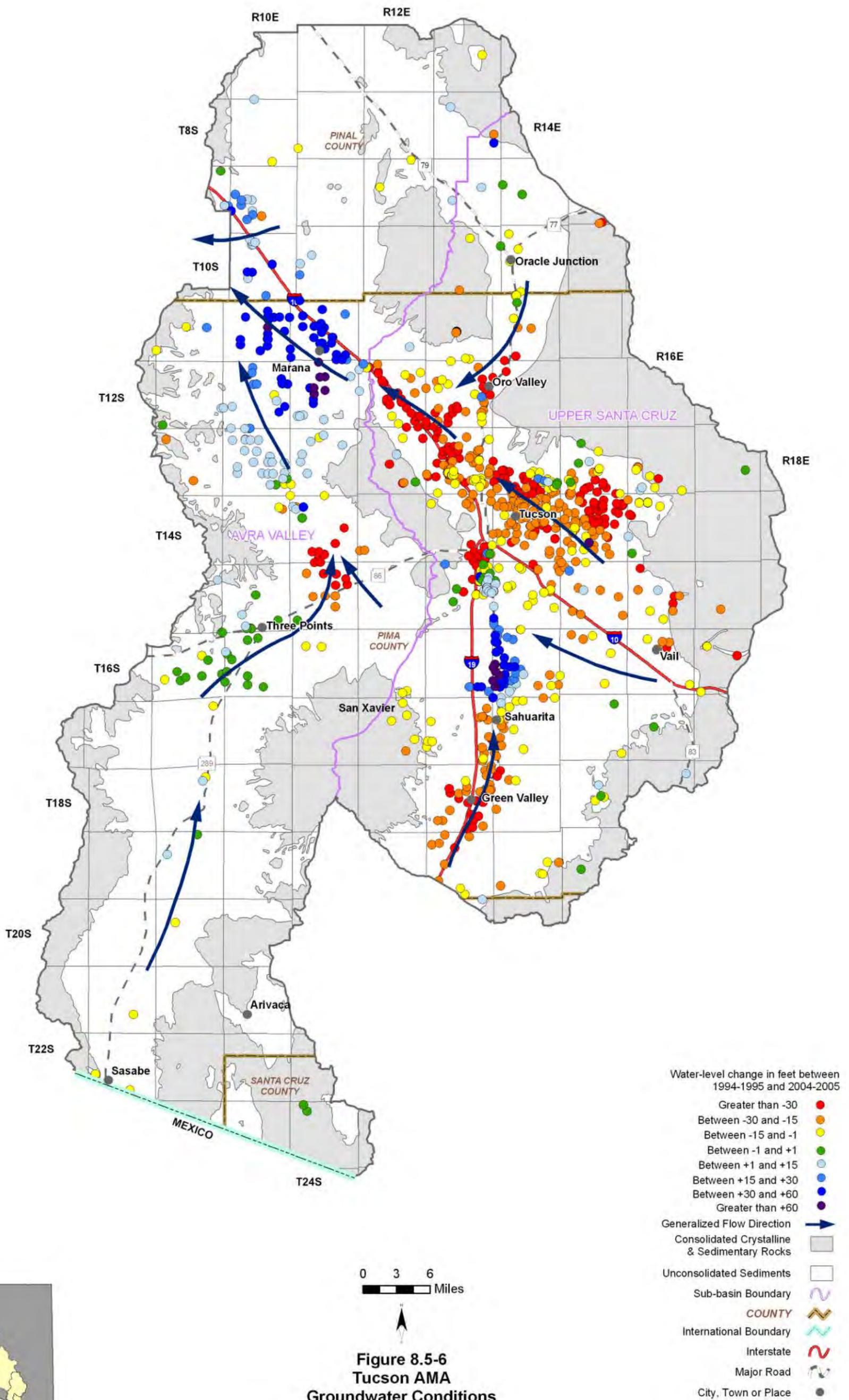


Legend	
	Proposed CC&N Boundary
	Township & Range
	Tucson Water Obligated Service Area (Not Yet Served)
	Red Rock Utilities Existing Service Area
	Farmer's Water Co. Service Area
	Metro SW E&T Water Service Area
	Rancho Sahuarita Water Co. Service Area
	Arizona State Prison Water Service Area
	Tucson Water Isolated System

ANDRADA 365
 Preliminary Integrated Water
 Management Plan (PIWMP)

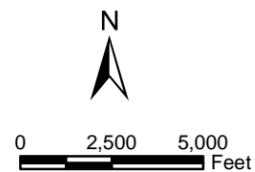
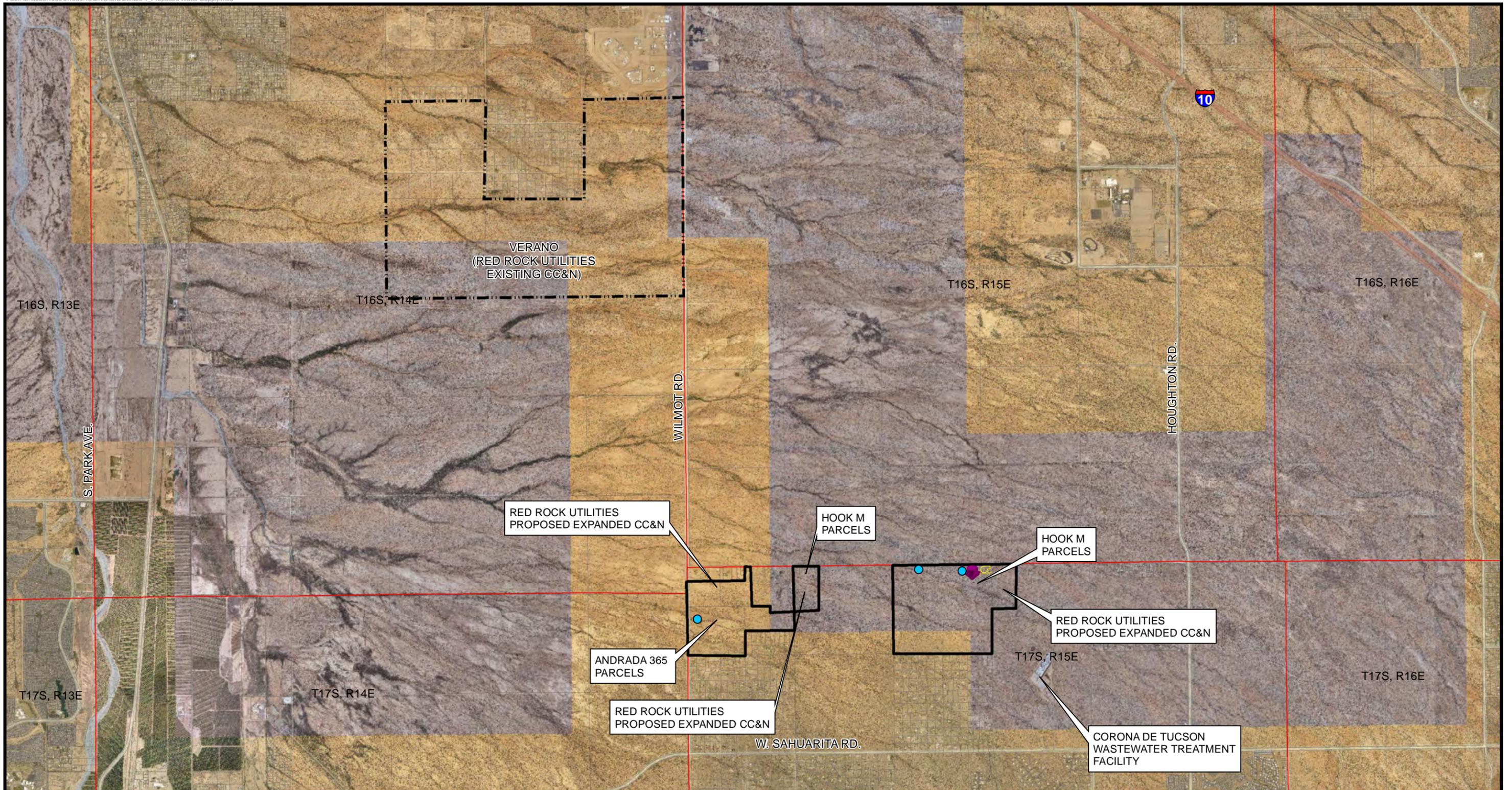
LOCAL WATER CONTEXT MAP
 EXHIBIT 1B

EXHIBIT 1C: REGIONAL WATER LEVEL TRENDS

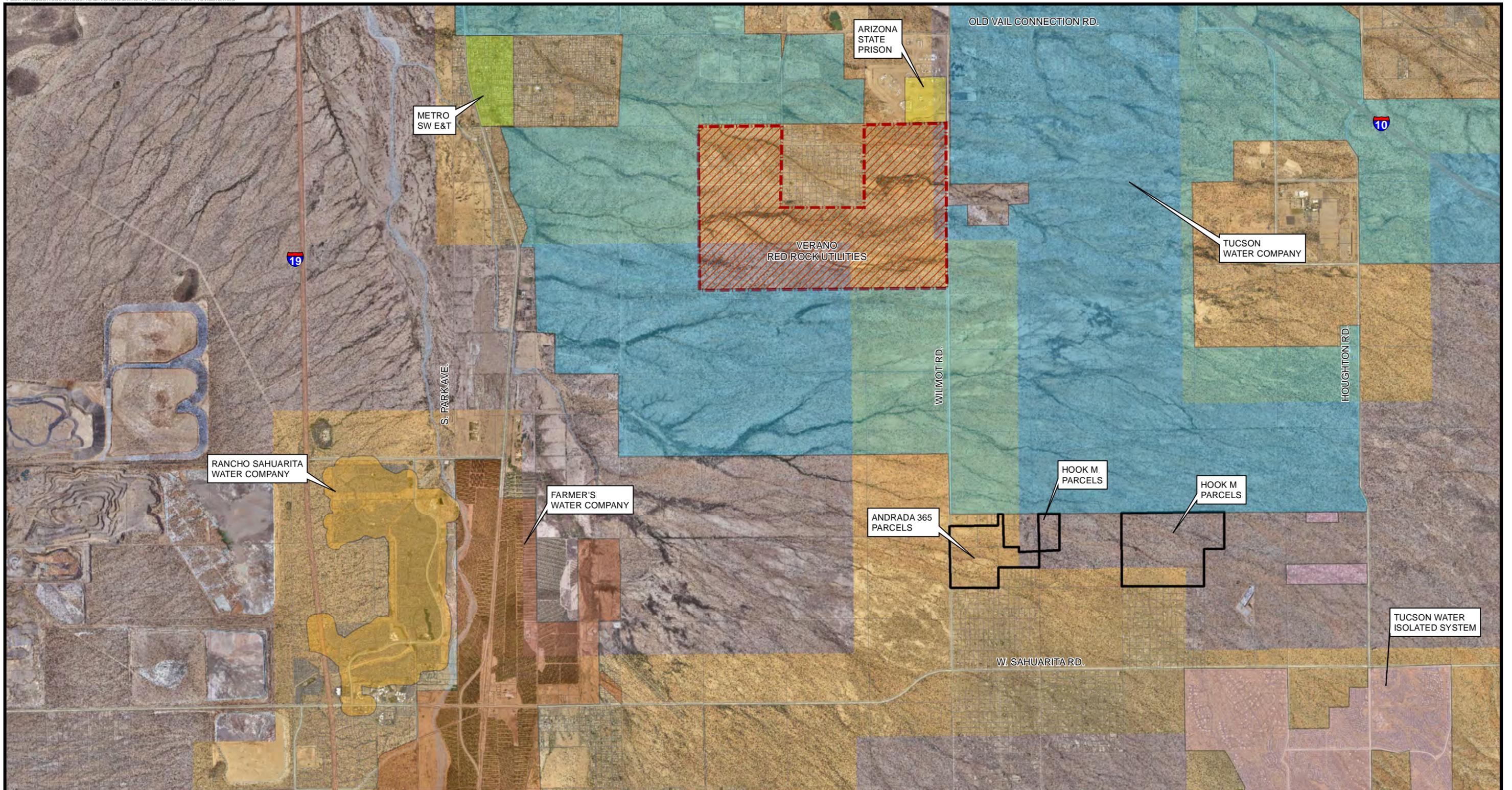


**Figure 8.5-6
Tucson AMA
Groundwater Conditions**

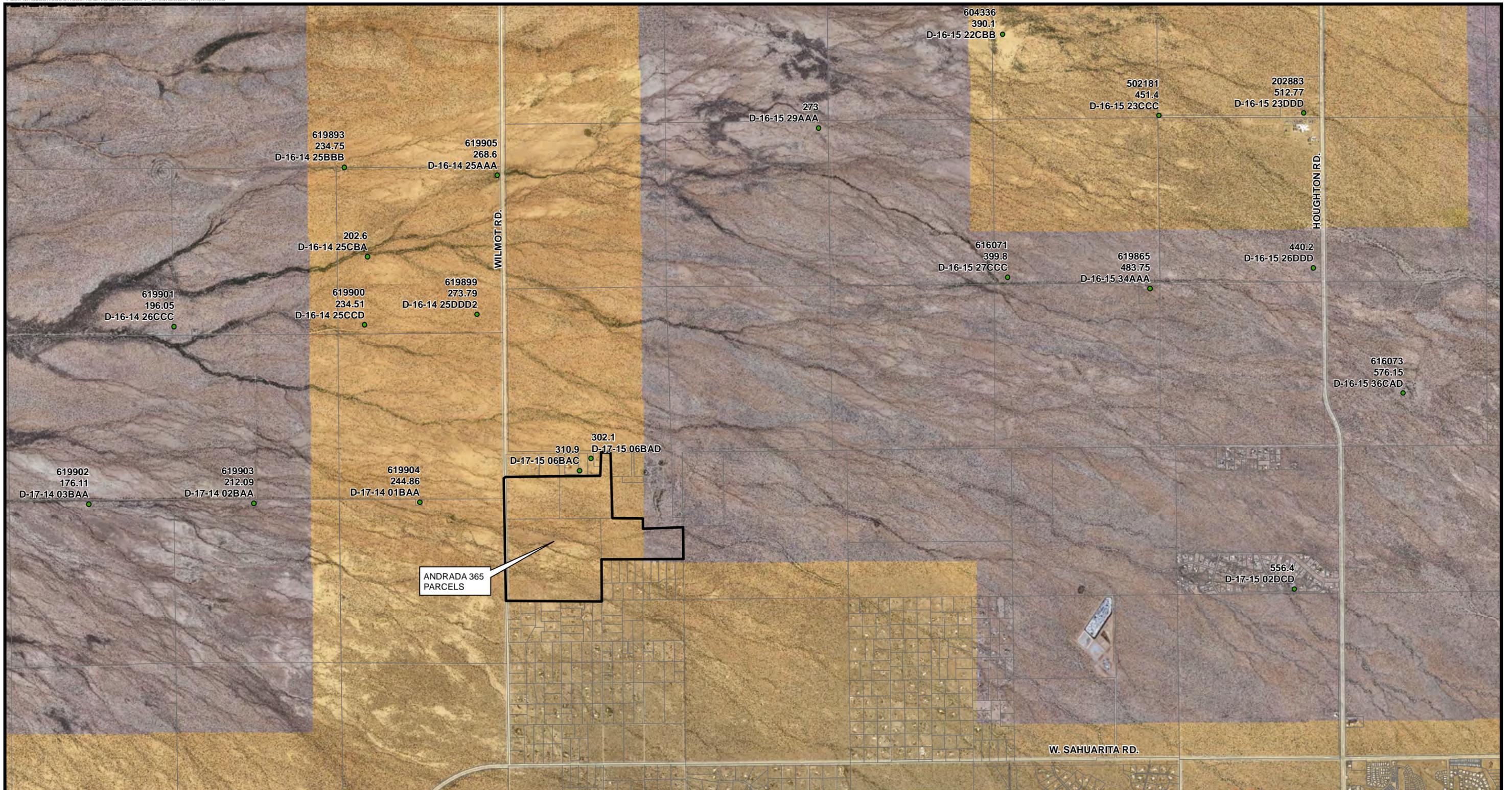




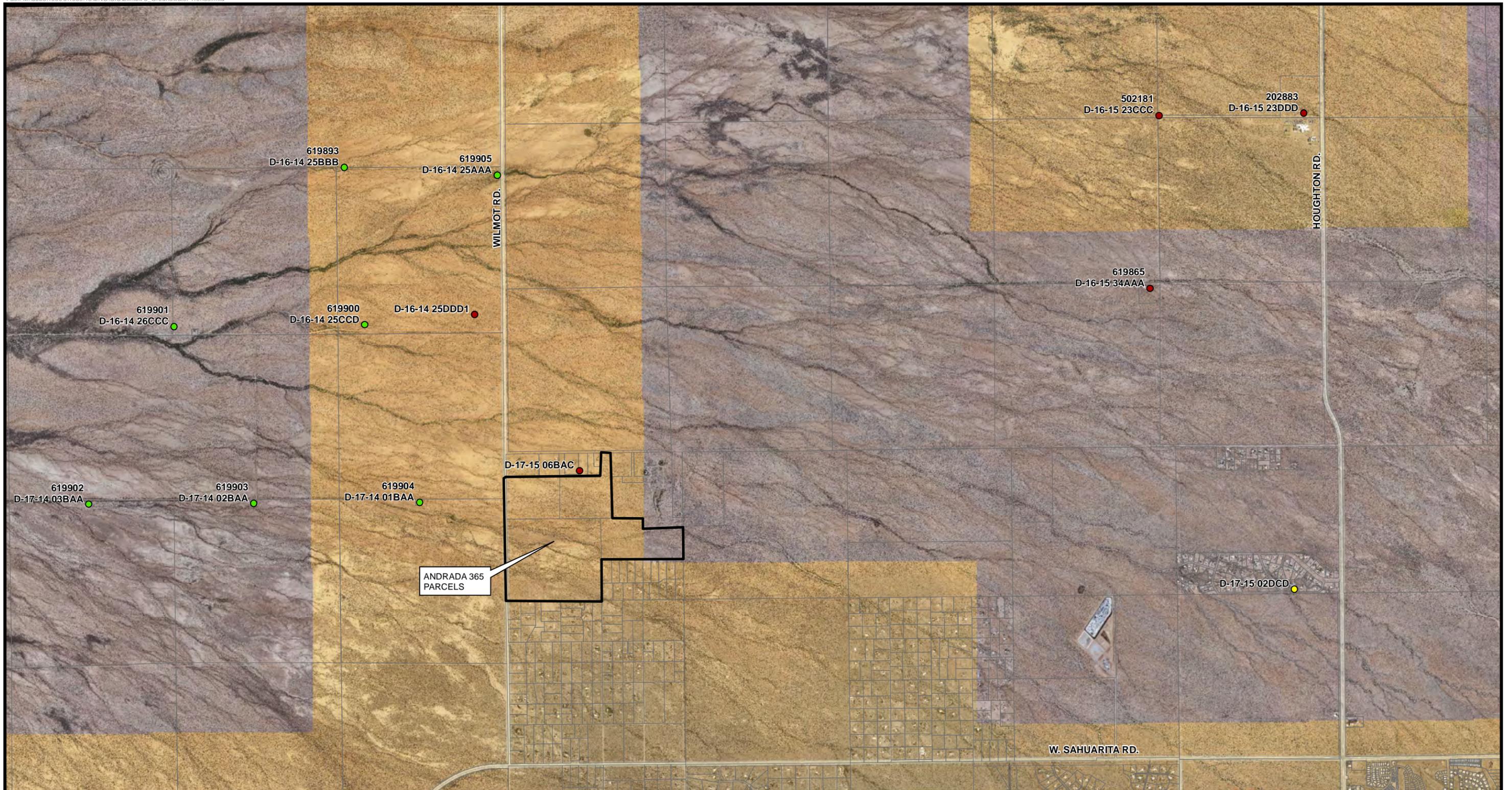
Legend	
	Existing CC&N Boundary
	Proposed CC&N Boundary
	Township & Range
	Booster
	Reservoir
	Proposed Wells



Legend	
	Existing CC&N Boundary (Red Rock Utilities)
	Proposed CC&N Boundary
	Tucson Water Obligated Service Area (Not Yet Served)
	Red Rock Utilities Existing Service Area
	Farmer's Water Co. Service Area
	Metro SW E&T Water Service Area
	Rancho Sahuarita Water Co. Service Area
	Arizona State Prison Water Service Area
	Tucson Water Isolated System



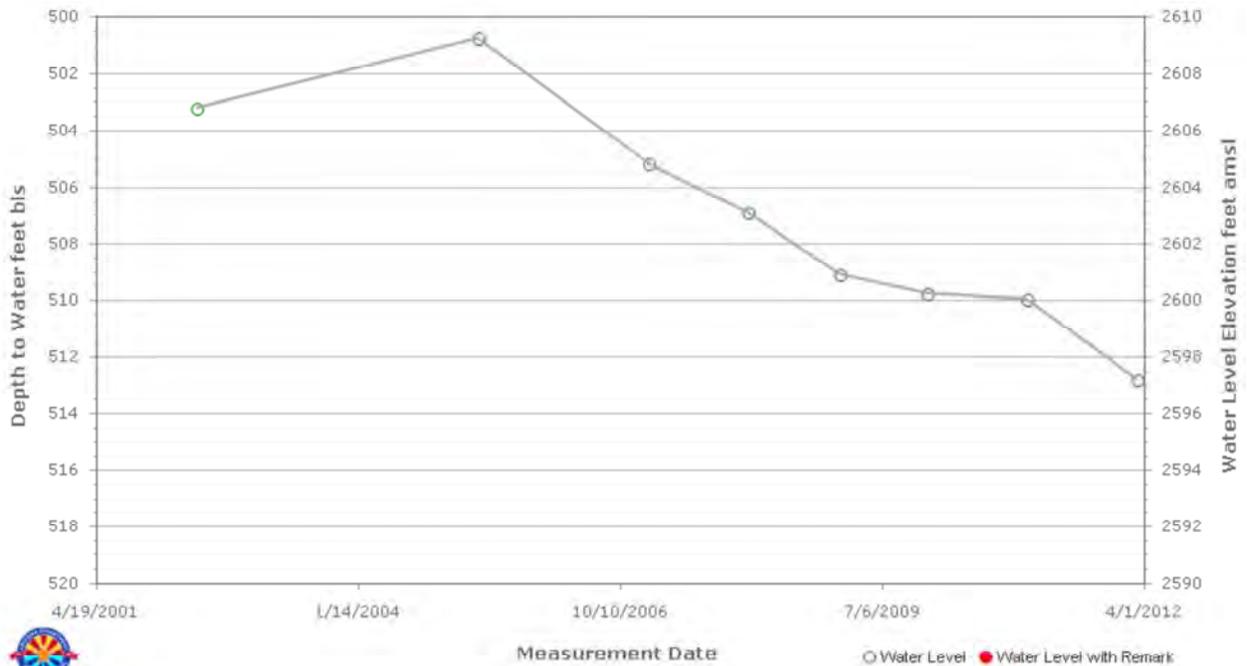
ANDRADA 365
PARCELS



Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-15 23DDD	320111110463101	202883	32° 1' 11.1"	110° 46' 31.0"	3110	UNUSED	940	32	3/25/2005	3/2/2012	512.77	2597.23



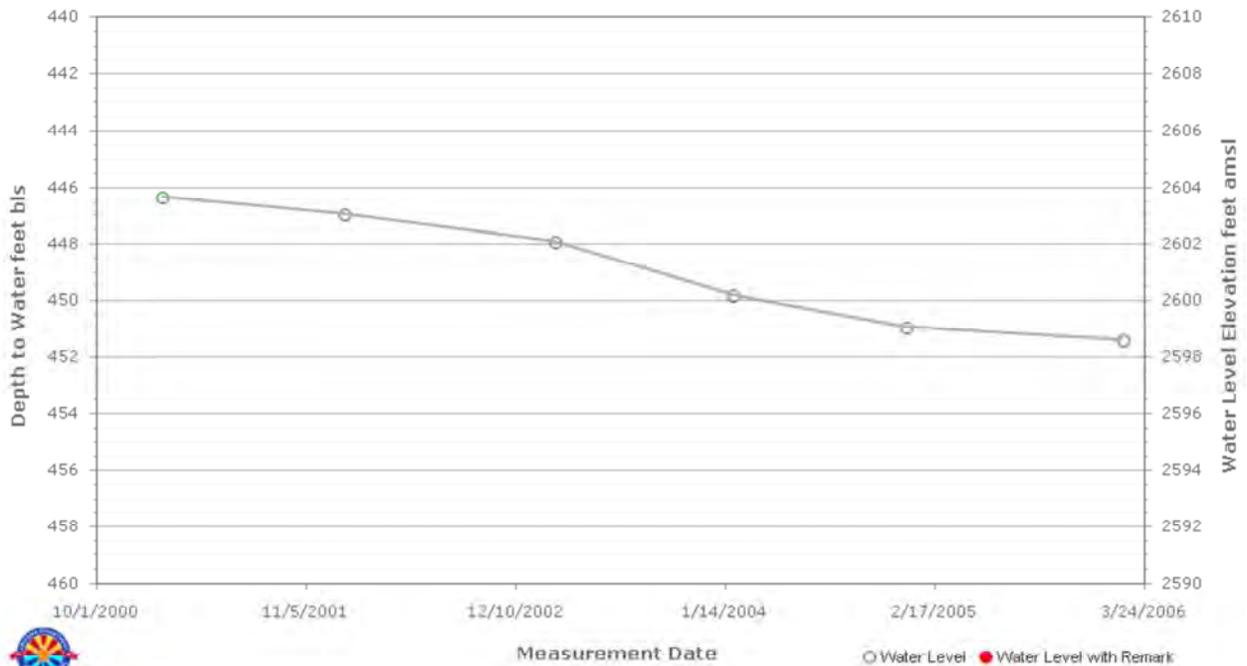
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-15 23CCC	320111110472501	502181	32° 1' 10.8"	110° 47' 25.0"	3050	PUBLIC SUPPLY	1003	16	7/15/1982	2/9/2006	451.4	2598.6



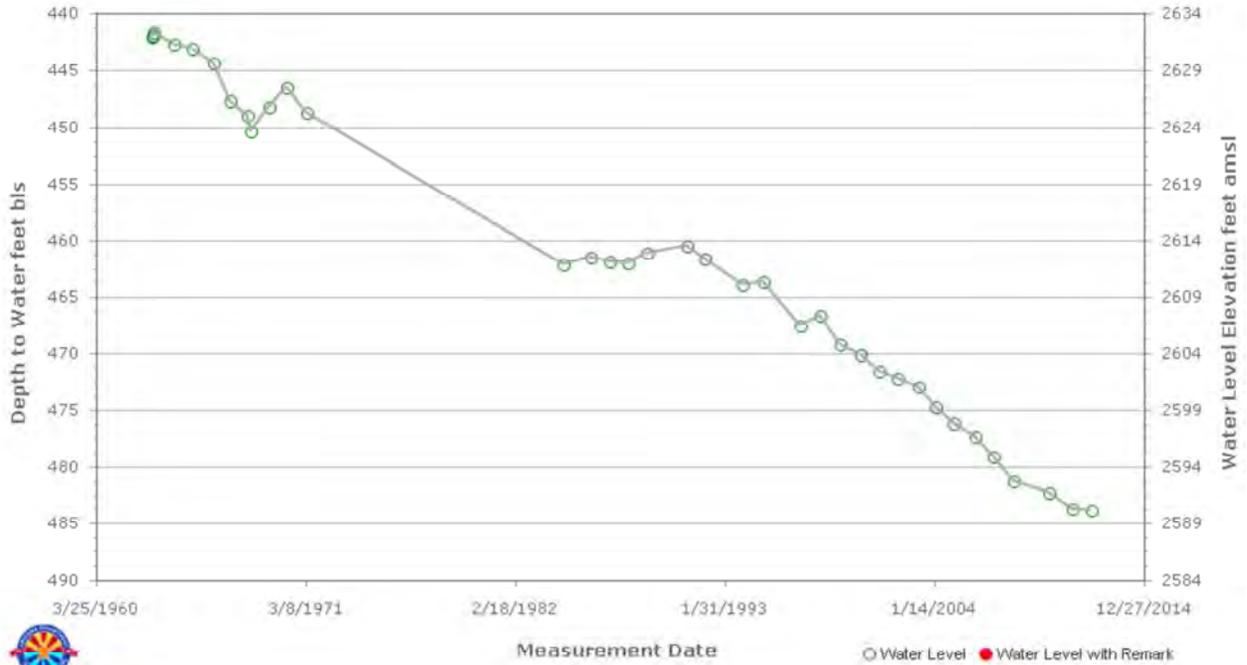
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-15 34AAA	320016110472901	619865	32° 0' 16.0"	110° 47' 29.0"	3074	PUBLIC SUPPLY	703	12	1/31/1963	3/2/2012	483.75	2590.25



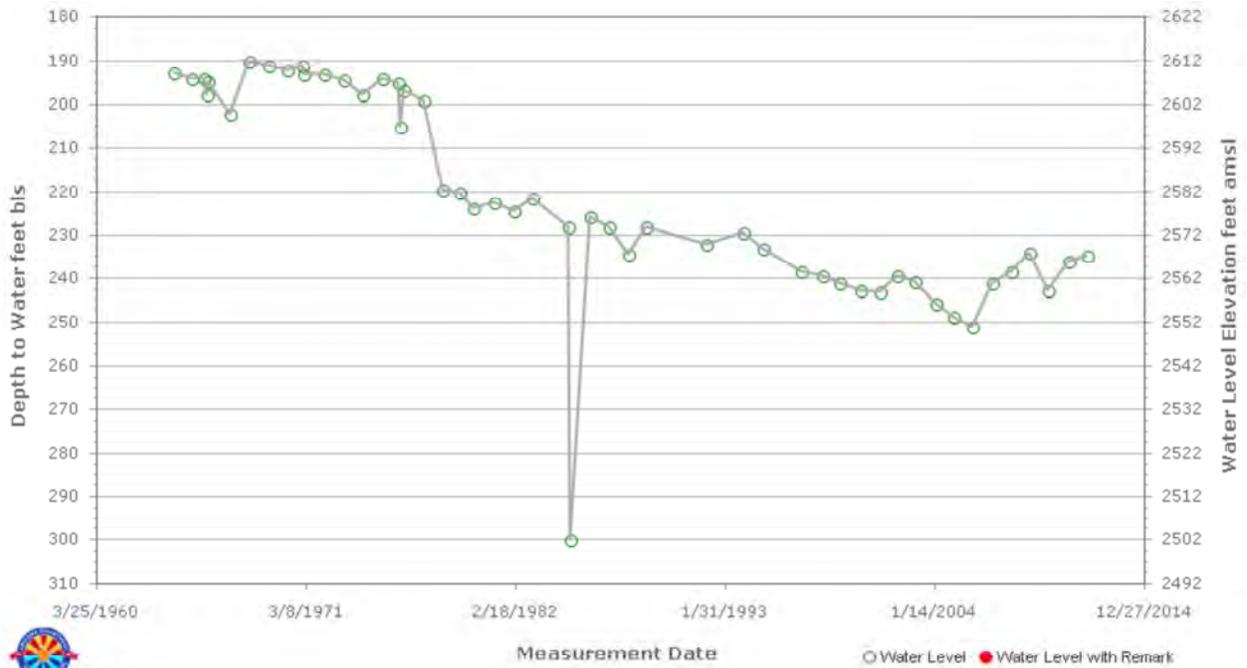
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

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Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-14 25BBB	320043110522901	619893	32° 0' 57.0"	110° 52' 29.0"	2802	PUBLIC SUPPLY	2500	16	2/2/1964	12/22/2011	234.75	2567.25



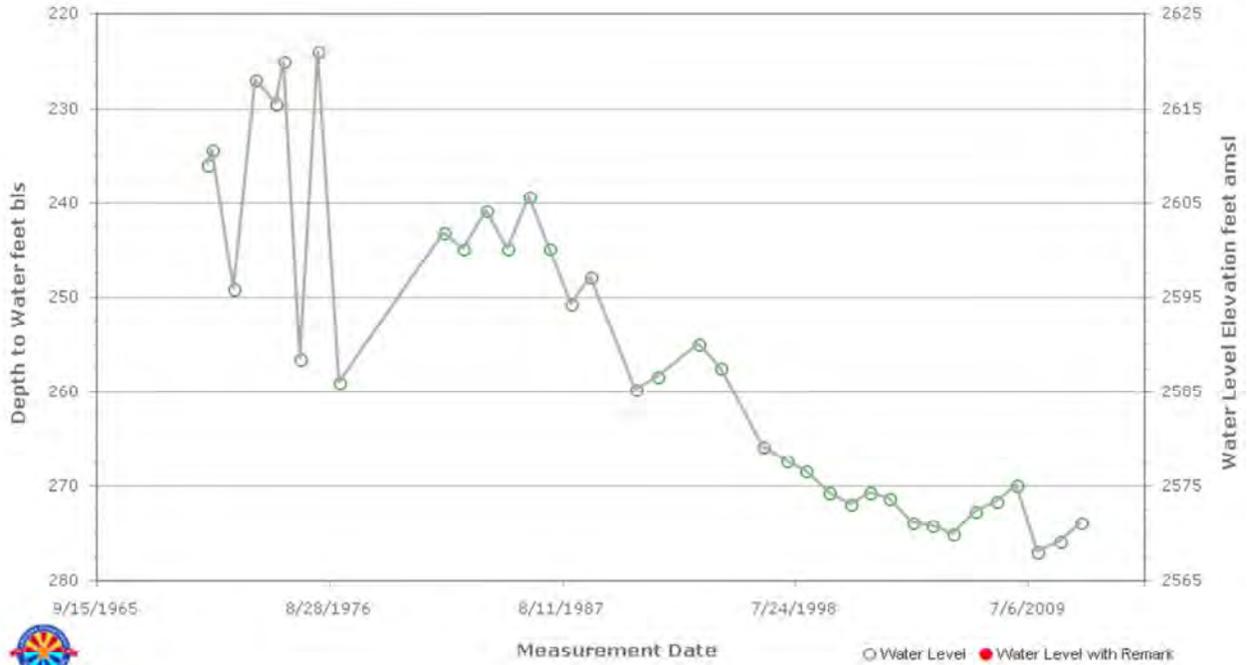
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-14 25DDD2	320010110514001	619899	32° 0' 10.0"	110° 51' 40.0"	2845	UNUSED	1000	16	11/1/1970	12/22/2011	273.79	2571.21



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Arizona GroundWater Monitoring Site Hydrograph

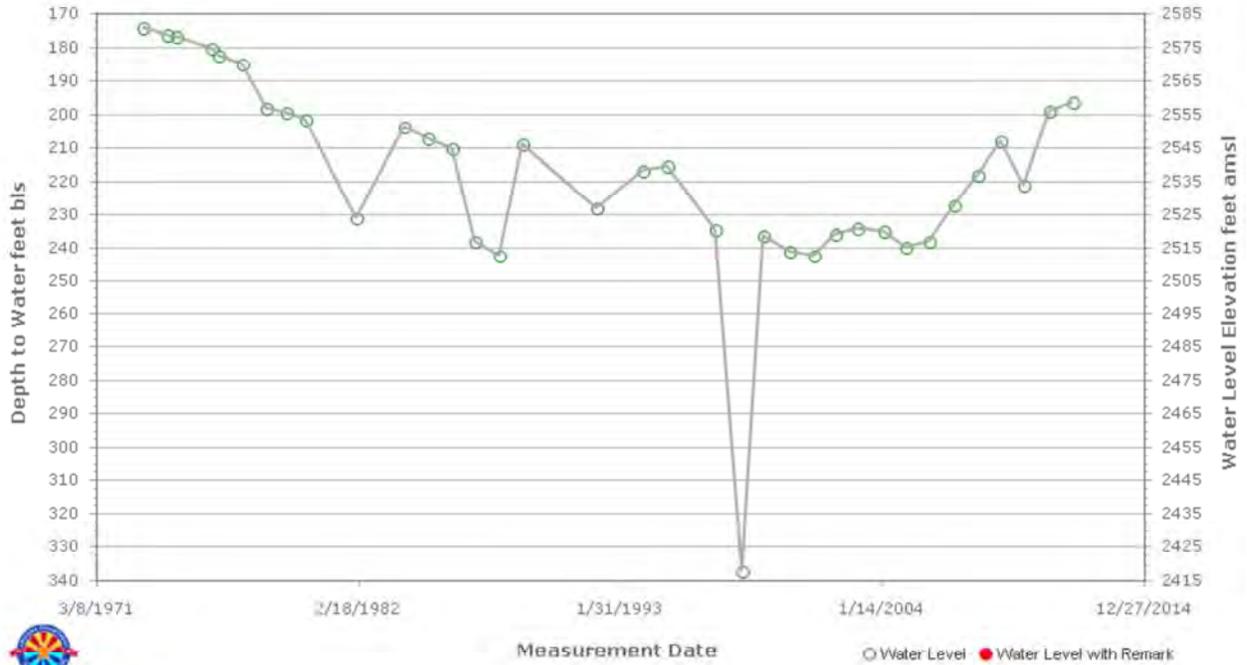
Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-14 25CCD	320007110522801	619900	32° 0' 7.0"	110° 52' 22.0"	2800	PUBLIC SUPPLY	990	16	11/1/1972	12/22/2011	234.51	2565.49



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Arizona GroundWater Monitoring Site Hydrograph

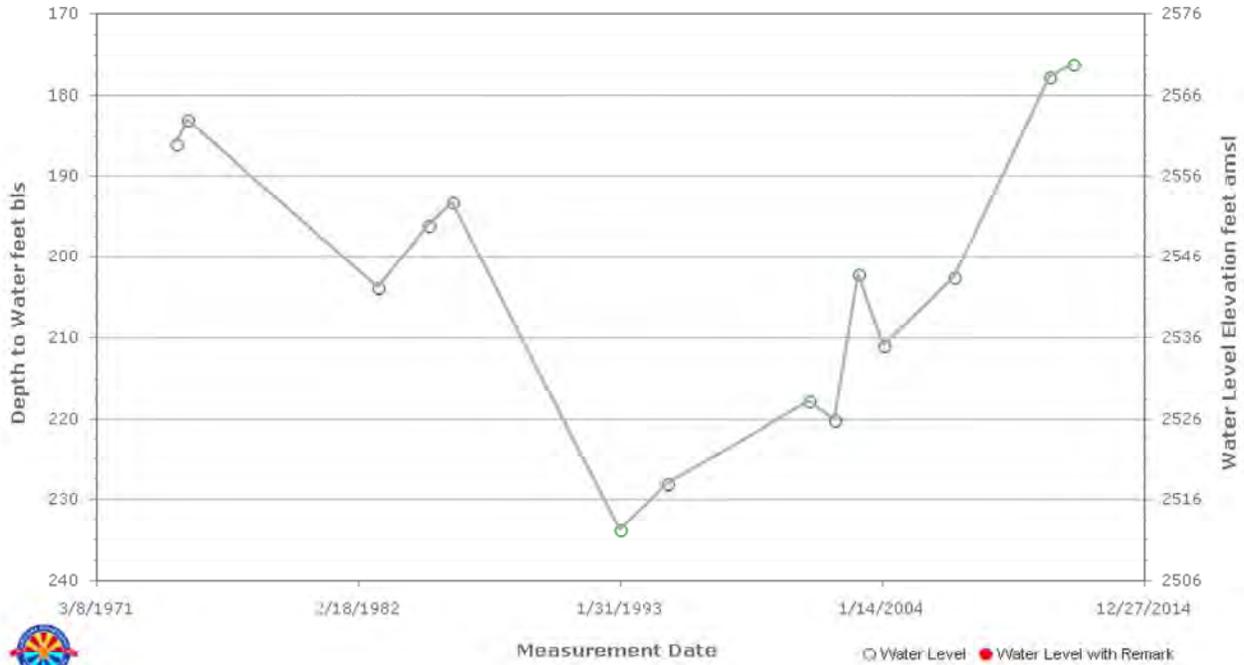
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D-16-14 26CCC	320007110533301	619901	32° 0' 7.0"	110° 53' 33.0"	2755	PUBLIC SUPPLY	810	16	12/1/1972	12/22/2011	196.05	2558.95



Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-17-14 03BAA	315909110540601	619902	31° 59' 11.0"	110° 54' 5.5"	2746	UNUSED	854			12/22/2011	176.11	2569.89



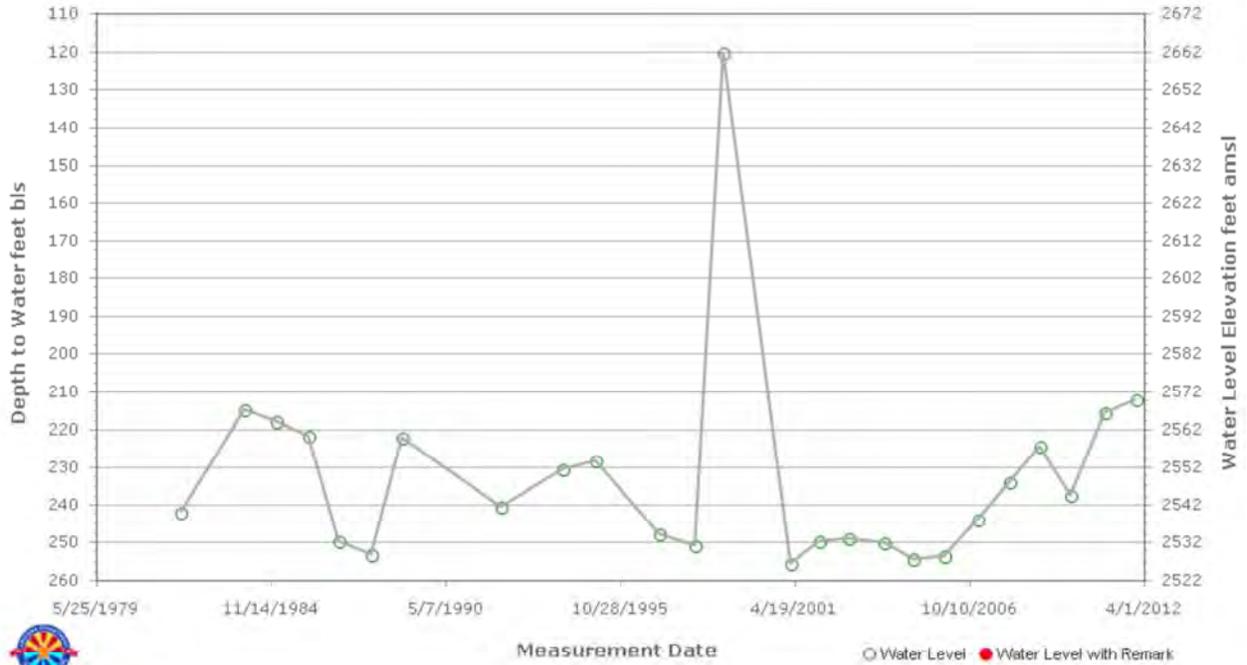
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

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Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-17-14 02BAA	395909110530701	619903	31° 59' 10.8"	110° 53' 4.0"	2782	PUBLIC SUPPLY	624	16	2/1/1973	12/22/2011	212.09	2569.91



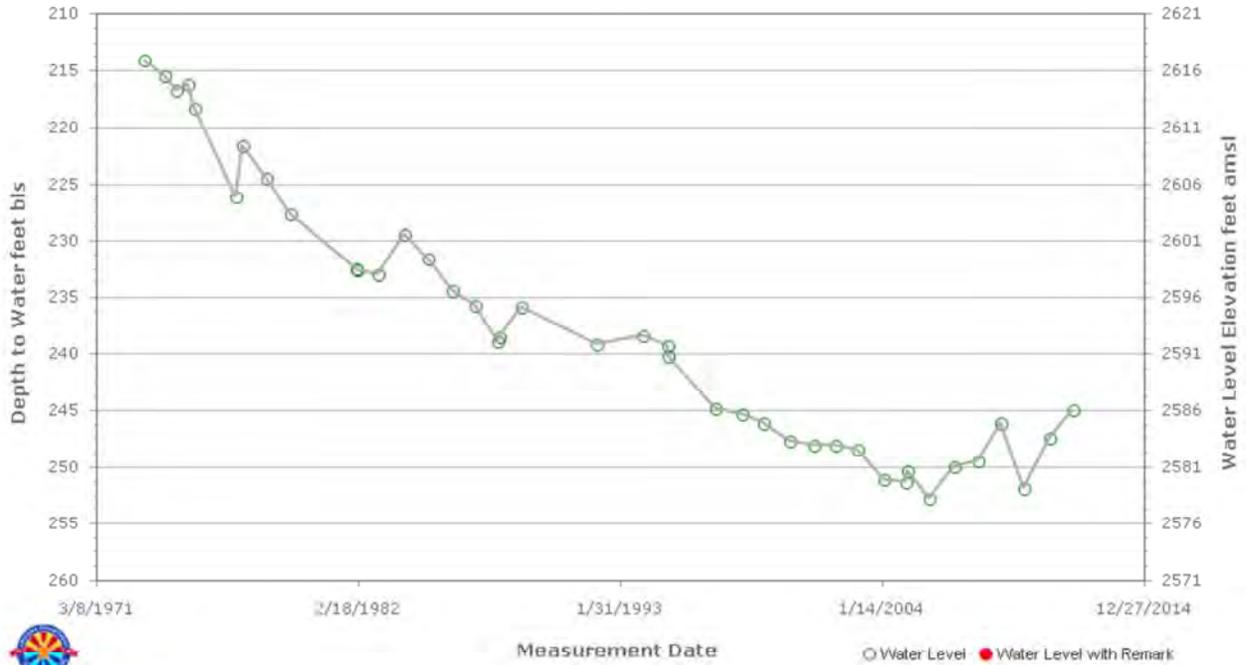
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Arizona GroundWater Monitoring Site Hydrograph

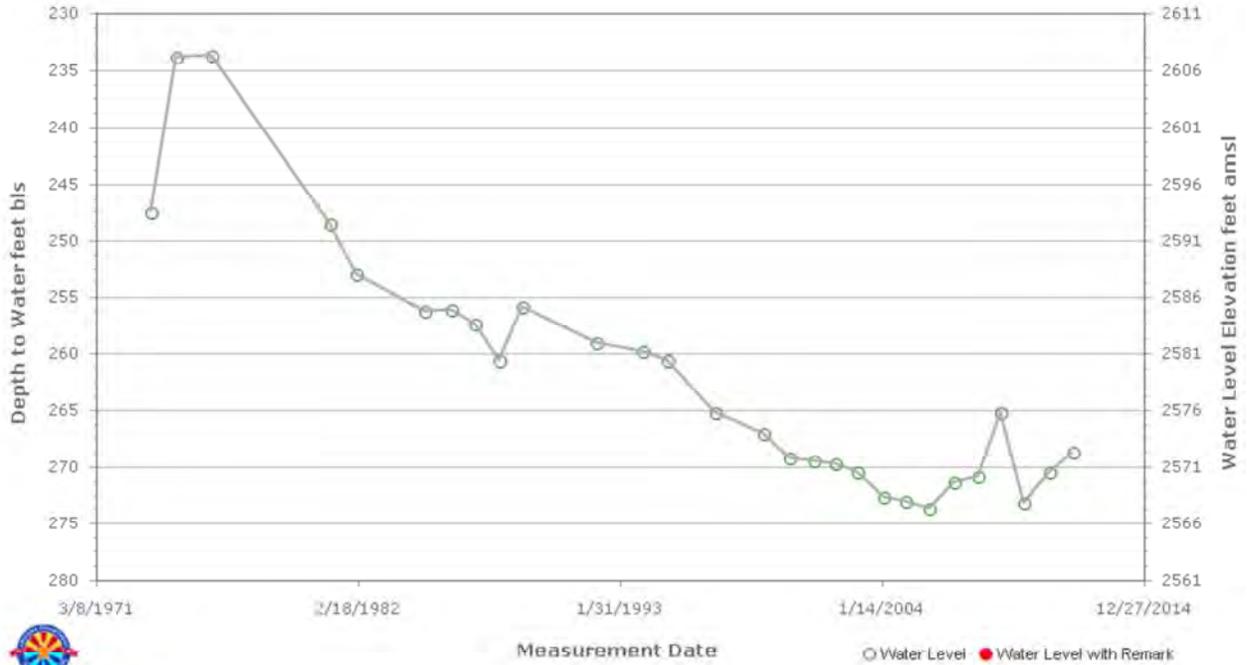
Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-17-14 01BAA	315909110520701	619904	31° 59' 10.6"	110° 52' 2.1"	2831	UNUSED	1545	16	1/1/1973	12/22/2011	244.86	2586.14



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Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-16-14 25AAA	320053110513501	619905	32° 0' 54.0"	110° 51' 32.0"	2841	PUBLIC SUPPLY	885	30	6/1/1973	12/22/2011	268.6	2572.4



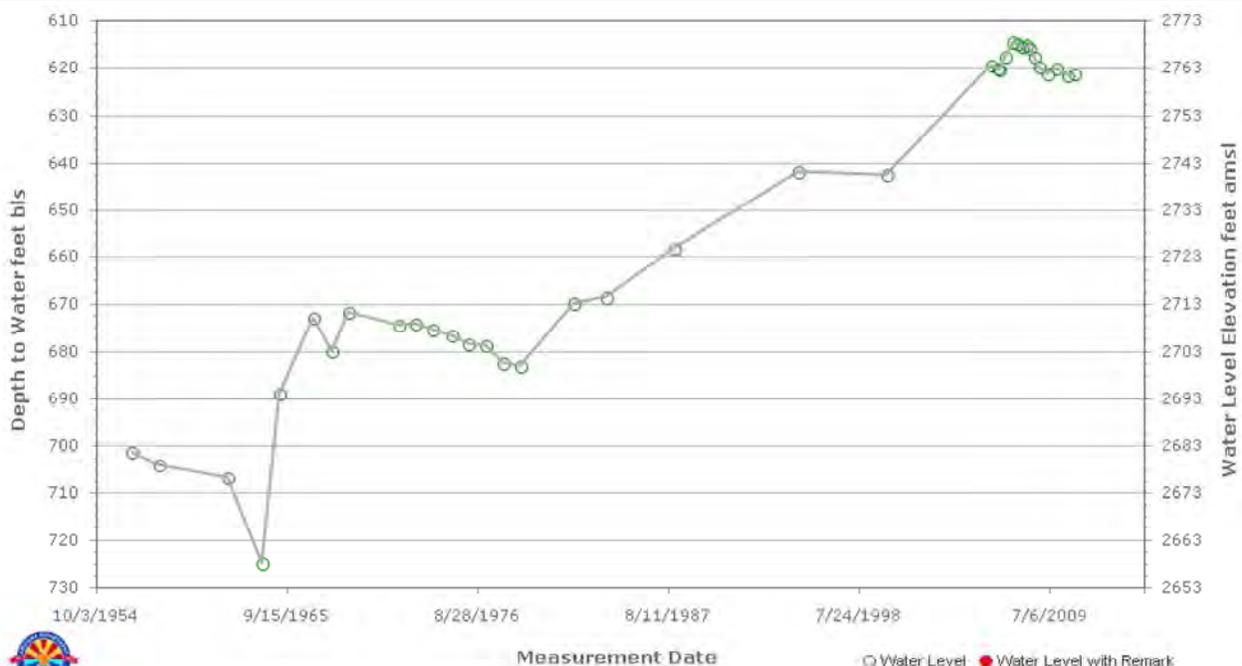
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-17-15 13BDC	315724110460701	801279	31° 57' 22.2"	110° 46' 1.3"	3382.77	UNUSED	947	8	9/1/1956	12/2/2010	621.09	2761.68



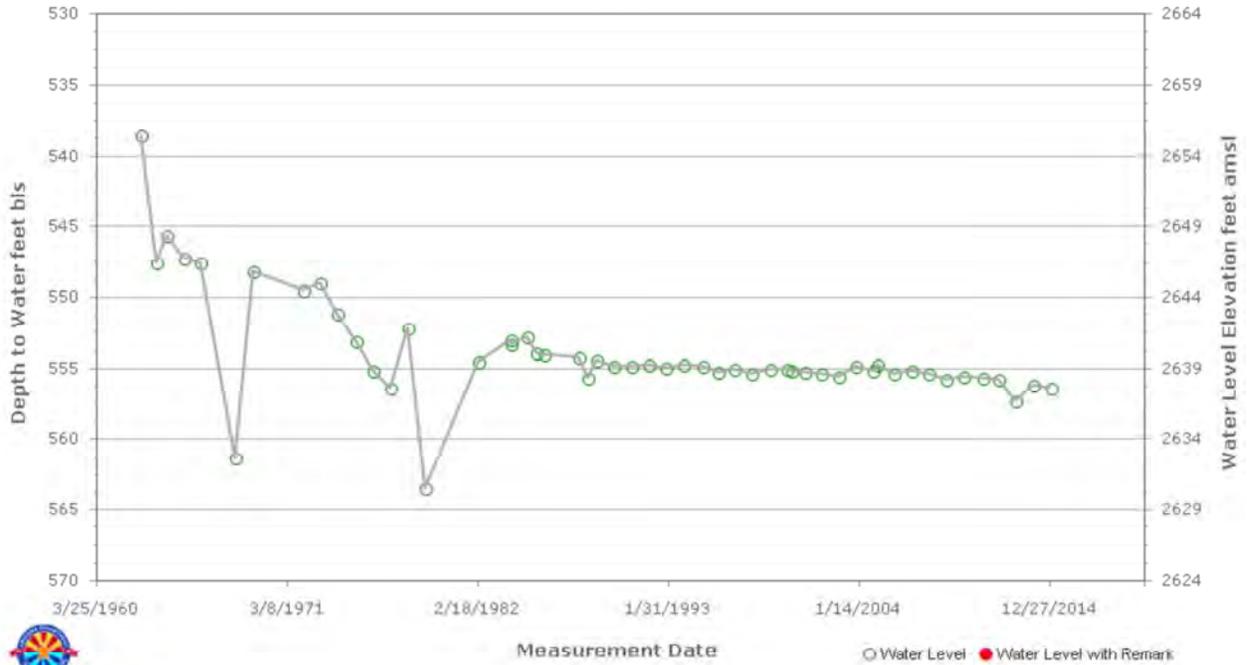
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

Well Info Map Reset Graph Auto Site Hydrograph Email Help

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-17-15 02DCD	315840110463701		31° 58' 40.3"	110° 46' 36.3"	3194	UNUSED	849	8.62	9/20/1962	1/22/2015	556.4	2637.6



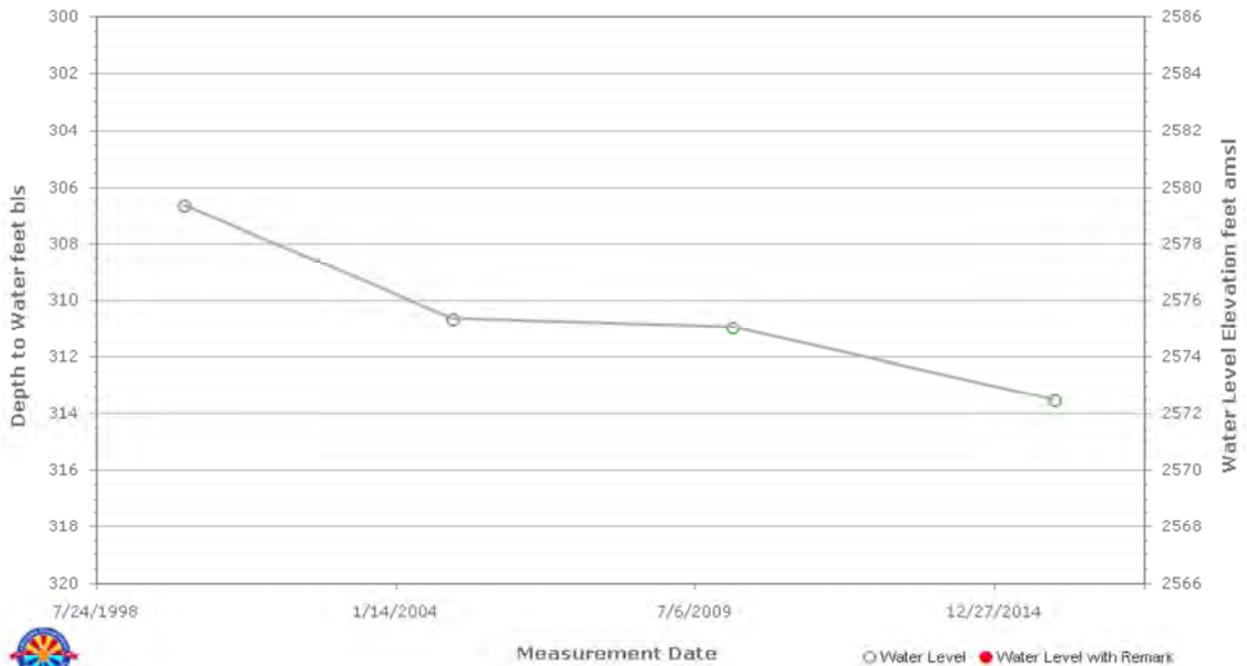
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

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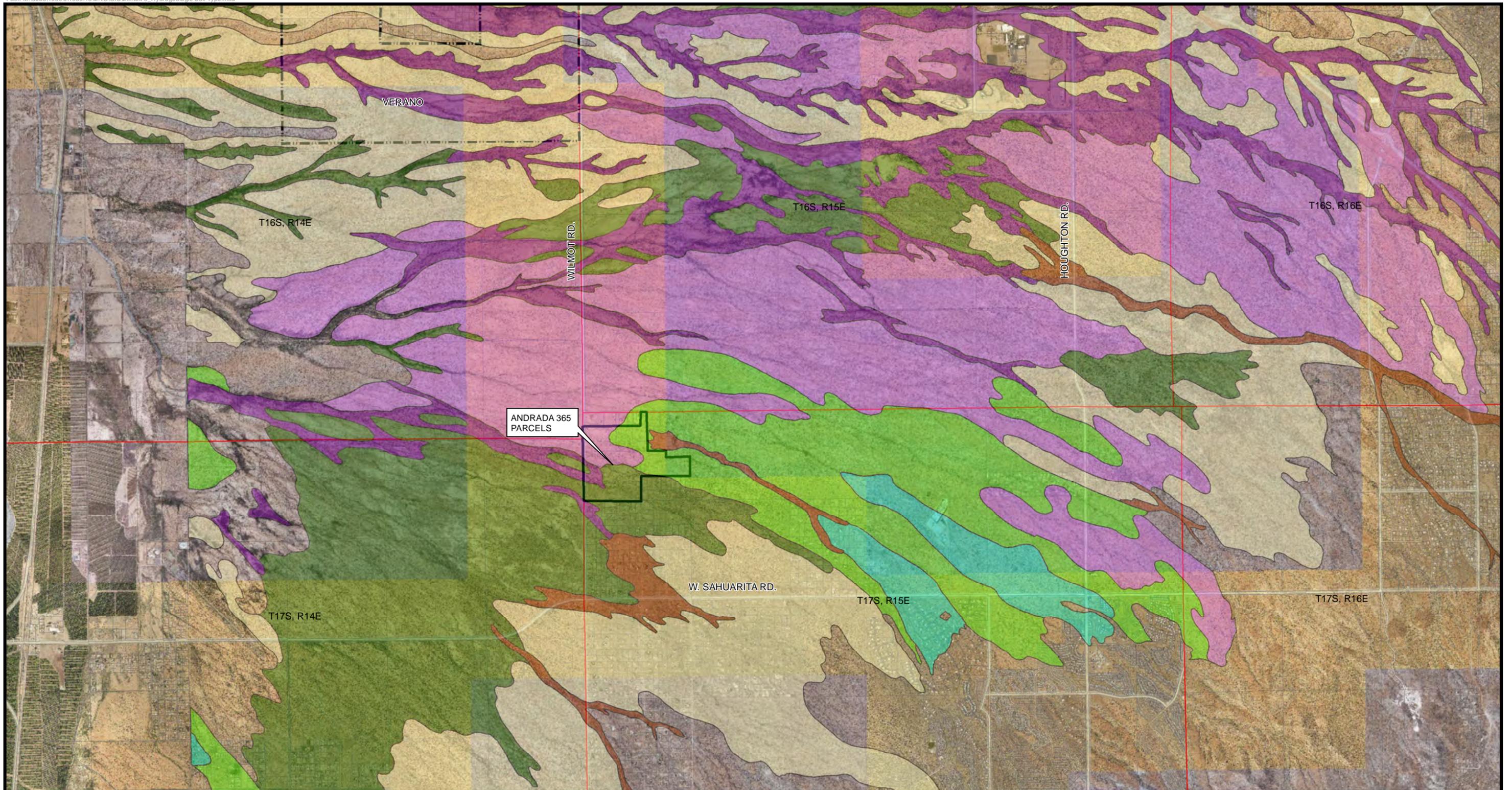
Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia. (in)	Drill Date	Latest WL Date	DTW (ft)	WL Elev. (ft)
D-17-15 06BAC	315920110510301		31° 59' 20.1"	110° 51' 2.4"	2886	DOMESTIC	320	10		1/21/2016	313.5	2572.5



GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 5/23/2016

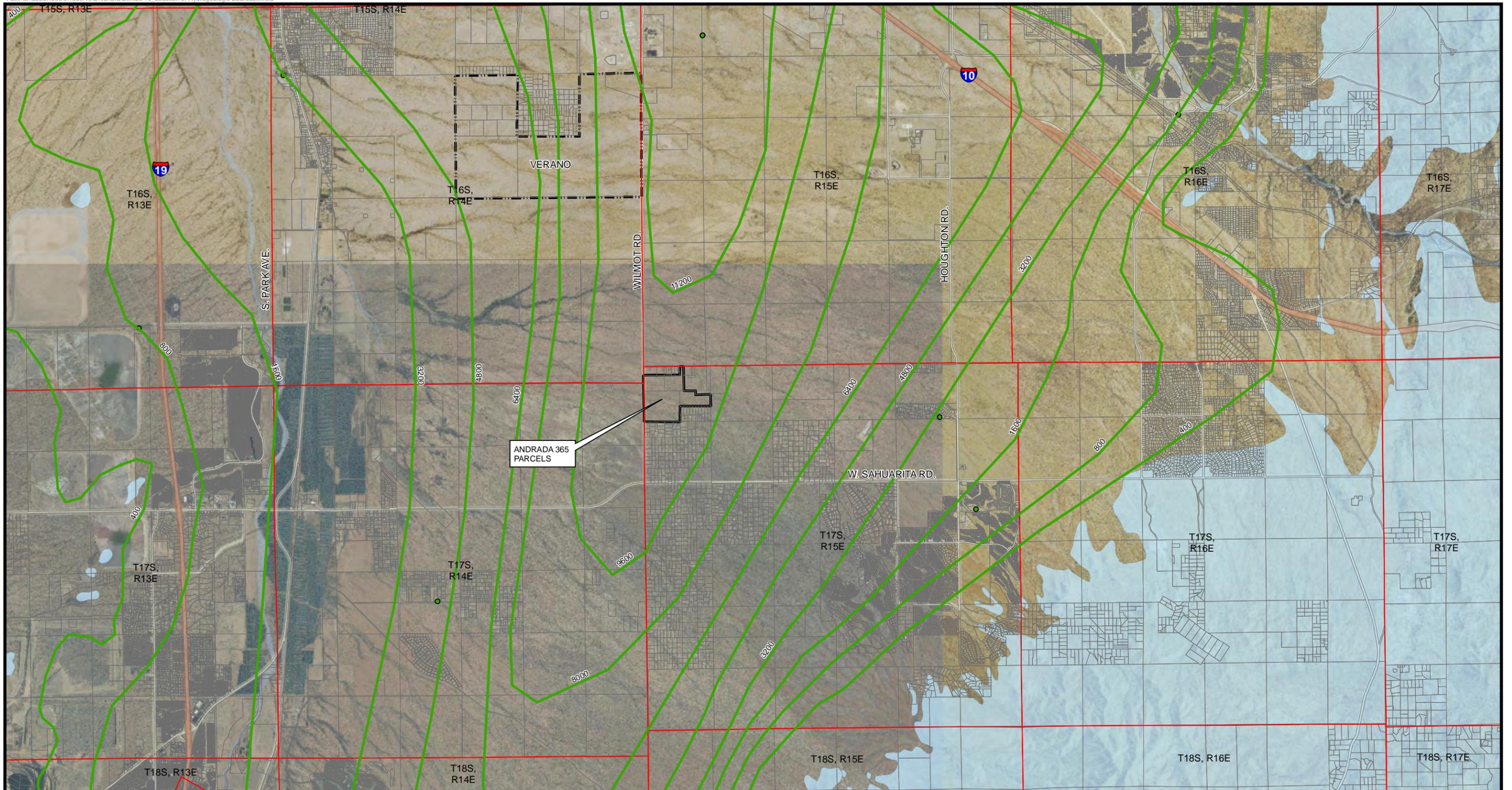


Legend	
Existing CC&N Boundary	Hayhook-Sahuarita complex, 1 to 5 percent slopes
Proposed CC&N Boundary	Sahuarita soils, mohave soils and urban land, 1 to 5 percent slopes
Arizo-Riverwash complex, 0 to 3 percent slopes	Tubac gravelly loam, 1 to 8 percent slopes
Bucklebar-Sahuarita complex, 0 to 3 percent slopes	Yaqui fine sandy loam, 1 to 3 percent slopes
Hantz loam, 0 to 1 percent slopes	

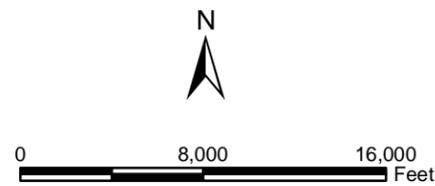
WestLand Resources

0 2,500 5,000 Feet

ANDRADA 365
Preliminary Integrated Water
Management Plan (PIWMP)
HYDROGEOLOGIC SOIL TYPE
EXHIBIT 9



ANDRADA 365 PARCELS



Legend

- Depth to Bedrock
- Proposed CC&N Boundary
- Township & Range
- Hydrogeologic Bedrock

ANDRADA 365
Preliminary Integrated Water
Management Plan (PIWMP)
LOCATION OF HYDROGEOLOGIC BEDROCK
EXHIBIT 10

EXHIBIT 11: MAPPED EARTH FISSURES

(SOURCE: MODIFIED FROM SHIPMAN, 2007)

PIMA COUNTY, ARIZONA EARTH FISSURE PLANNING MAP

by Todd Shipman
Arizona Geological Survey Open File Report 07-01,
version 1.0
June, 2007

Citation for this map: Shipman, T.C., 2007
Pima County Earth Fissure Planning Map, Arizona:
Arizona Geological Survey Open File Report 07-01, v1,
Sheet 4, scale 1:250,000

This map identifies known or reported earth fissures and indicates study areas for detailed mapping of the fissures by the Arizona Geological Survey. A 1:250,000 USGS topographic base in the background, shows the topography and major physiographic features. Enlargement of this map image does not improve the 1:250,000 scale location accuracy of the mapped features. This map should not be used for site specific evaluation.

Study areas were identified based on three criteria; 1) potential for rapid development of communities; 2) the presence of known or reported fissures; and 3) areas where rapid land subsidence has been reported.

Map Index



Black lines on this map represent the approximate location of earth fissures as interpreted on air photos or by field reconnaissance. Many of the earth fissures have not been verified on the ground. The map is incomplete due to 1) masking of fissures by development and agriculture, 2) ongoing changes in fissure length and geometry, 3) the presence of incipient fissures that lack surface expression, and 4) the potential that photogeologically mapped features are incorrectly identified as earth fissures. A blank area on the map does not necessarily mean earth fissures are not present.

— County Line Boundary

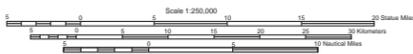
MARANA

Names identify areas that will be systematically and sequentially mapped by the AZGS.

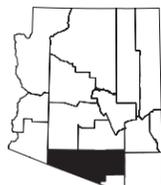
EARTH FISSURES

MARANA

ANDRADA 365



Topographic base from USGS 1:250,000 scale maps; Ajo, Luke, Nogales, and Tucson.
Contour interval 200 feet with supplementary contours at 100 foot intervals.



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Arizona Geological Survey
416 W. Congress Street, Suite 100
Tucson, AZ 85701
(520) 770-3500
www.azgs.az.gov

EXHIBIT 12A - LAND SUBSIDENCE PIMA COUNTY

111°0'0"W

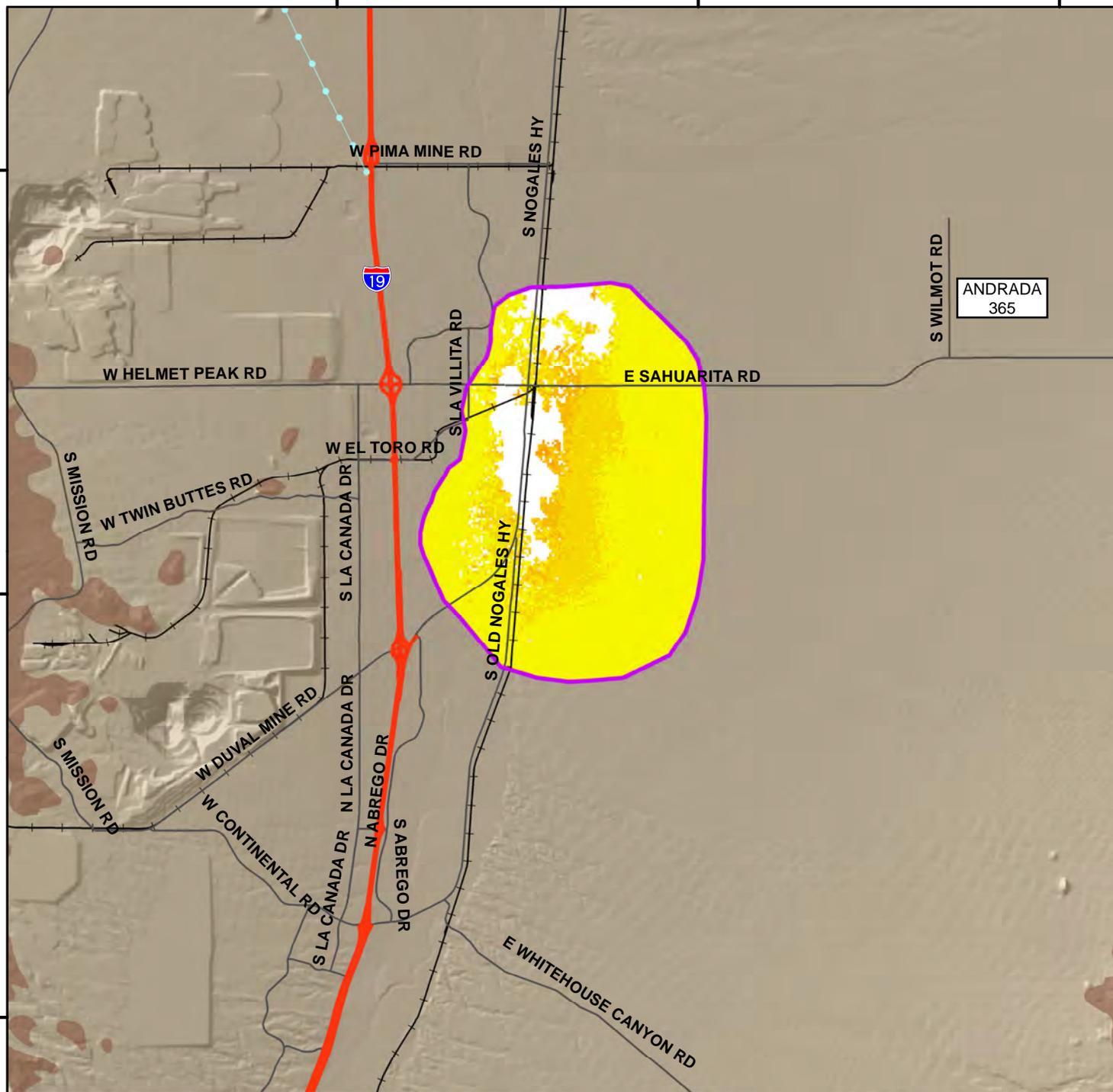
110°55'0"W

110°50'0"W

32°0'0"N

31°55'0"N

31°50'0"N



Total Land Subsidence in the Sahuarita and Green Valley Areas, Pima County
 Based on Radarsat-2 Satellite Interferometric Synthetic Aperture Radar (InSAR) Data
 Time Period of Analysis: 1.2 Years 02/16/2013 To 05/18/2014

© MDA 2013 - 2014

Explanation

02/16/2013 To 05/18/2014

Total Land Subsidence	
	Decorrelation/No Data
	Greater 40 cm (15.7 in)
	25 - 40 cm (9.8 - 15.7 in)
	15 - 25 cm (5.9 - 9.8 in)
	10 - 15 cm (3.9 - 5.9 in)
	6 - 10 cm (2.4 - 3.9 in)
	4 - 6 cm (1.6 - 2.4 in)
	2 - 4 cm (0.8 - 1.6 in)
	1 - 2 cm (0.4 - 0.8 in)
	0 - 1 cm (0 - 0.4 in)

	Subsidence Feature
	Hardrock
	CAP Canal
Highways and Interstates	
	Interstate
	US
	State
	Roads
	Railway



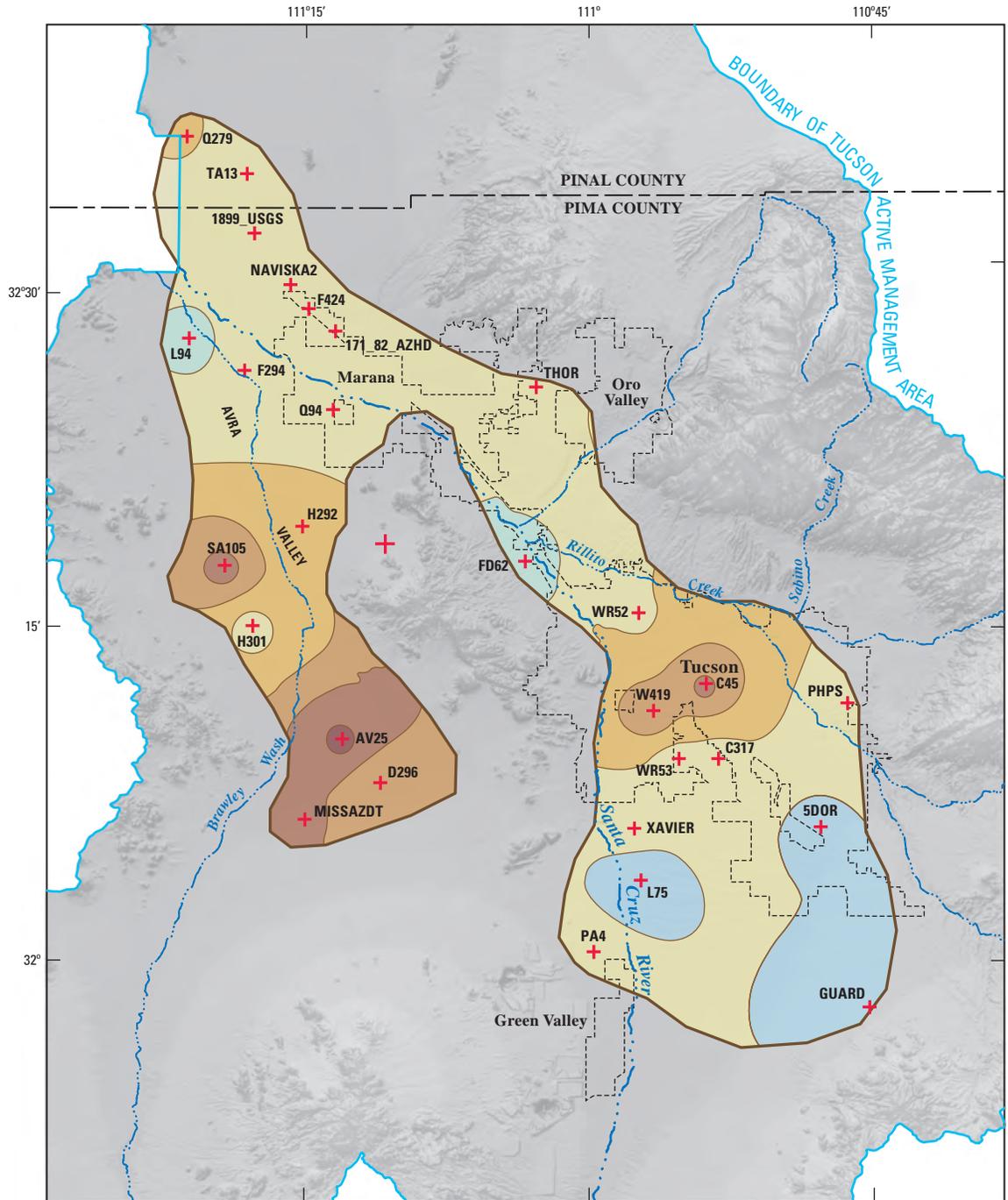
Decorrelation (white areas) are areas where the phase of the received satellite signal changed between satellite passes, causing the data to be unusable. This occurs in areas where the land surface has been disturbed (i.e. bodies of water, snow, agriculture areas, areas of development, etc).

Coordinate System: NAD 1983 UTM Zone 12N
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Meter
 Created: 11/17/2014



EXHIBIT 12B

18 Land Subsidence and Aquifer-System Compaction in the Tucson Active Management Area, South-Central Arizona, 1987–2005

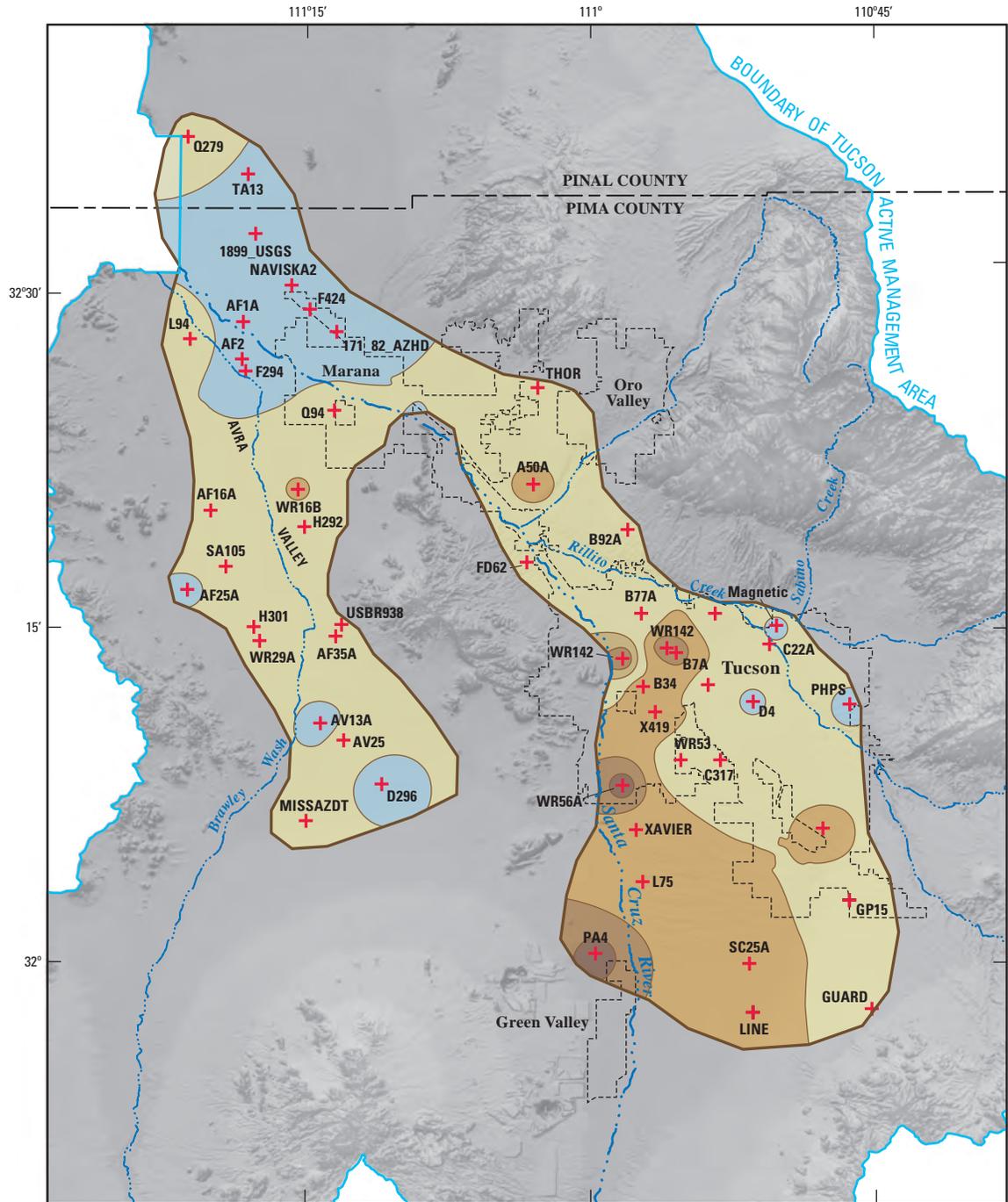


Base from U.S. Geological Survey digital data, 1:100,000, 1982 Universal Transverse Mercator projection, Zone 12

EXPLANATION



Figure 9. Land-surface elevation change in the Tucson Active Management Area from 1987 to 1998.



Base from U.S. Geological Survey digital data, 1:100,000, 1982 Universal Transverse Mercator projection, Zone 12

EXPLANATION

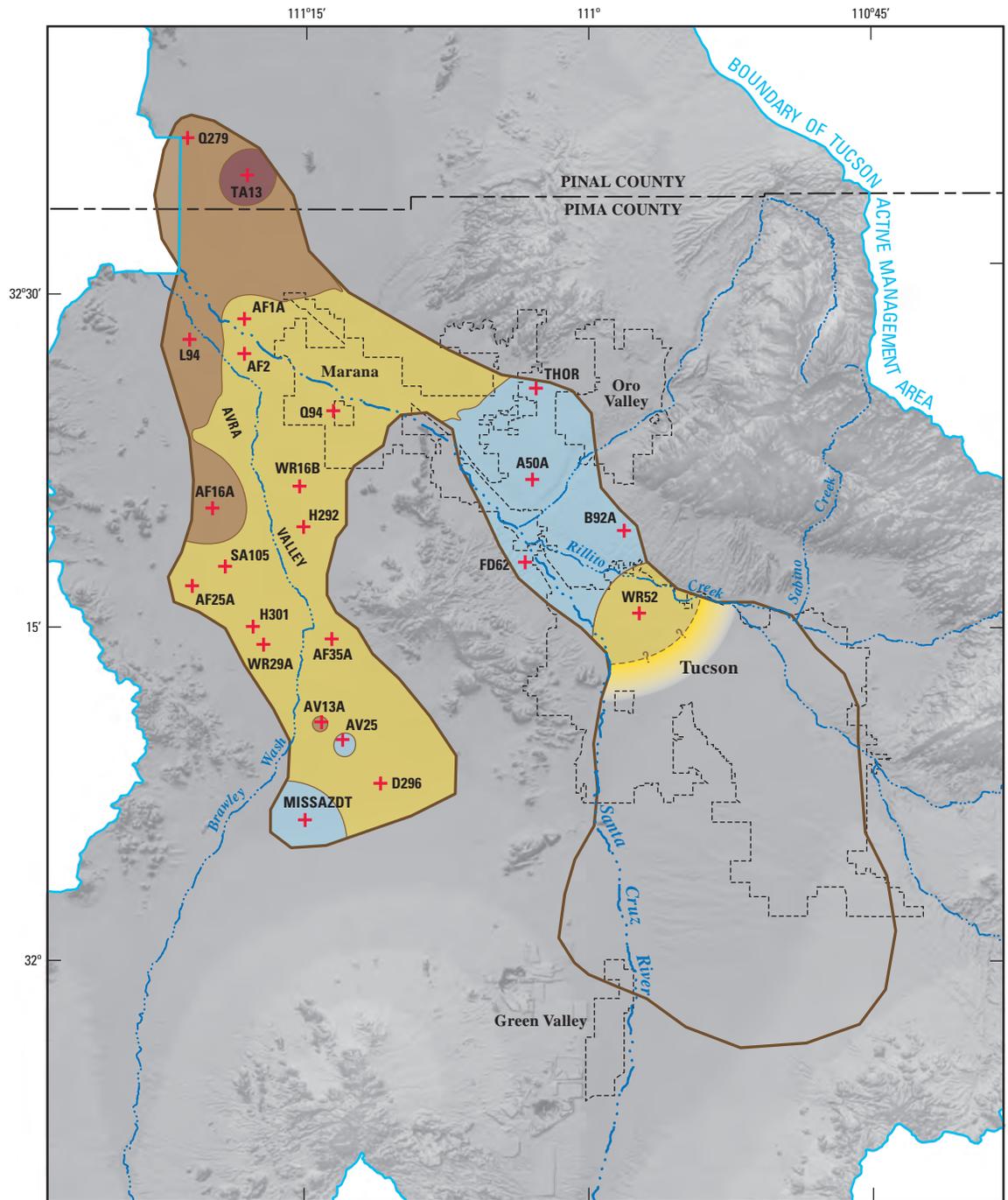
- ELEVATION CHANGE FROM 1998–2002, IN INCHES:
- 0 to 1
 - 0 to -1
 - 1 to -2
 - 2 to -3
 - 3 to -4
- + BENCHMARK



Figure 10. Land-surface elevation change in the Tucson Active Management Area from 1998 to 2002.

EXHIBIT 12D

20 Land Subsidence and Aquifer-System Compaction in the Tucson Active Management Area, South-Central Arizona, 1987–2005



Base from U.S. Geological Survey digital data, 1:100,000, 1982 Universal Transverse Mercator projection, Zone 12

EXPLANATION

ELEVATION CHANGE FROM 2002–2005, IN INCHES:

0 to 1	-1 to -2
0 to -1	-2 to -3

+ BENCHMARK

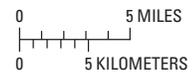
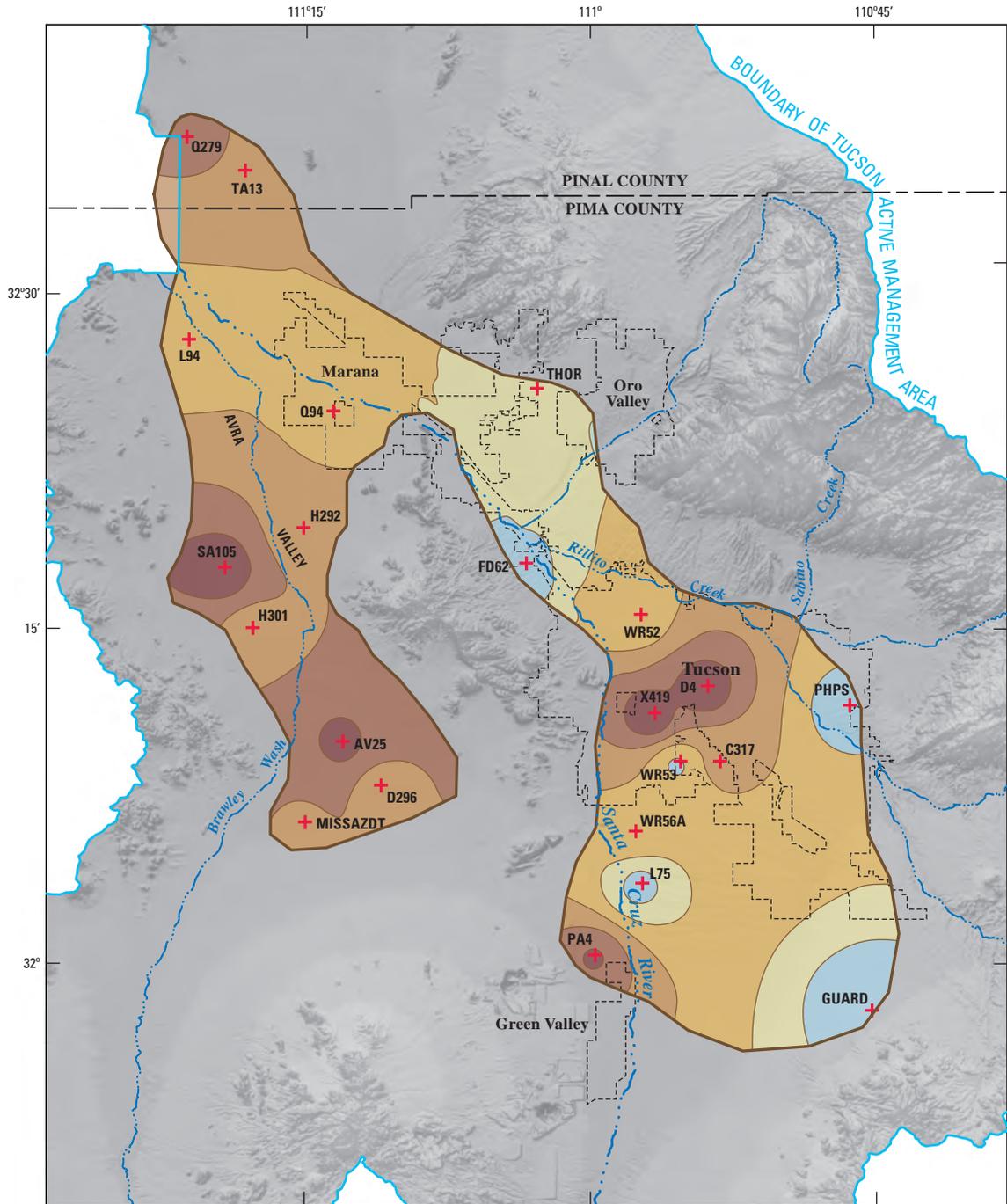


Figure 11. Land-surface elevation change in the Tucson Active Management Area from 2002 to 2005.



Base from U.S. Geological Survey digital data, 1:100,000, 1982 Universal Transverse Mercator projection, Zone 12

EXPLANATION

ELEVATION CHANGE FROM 1987–2004 AND 2005, IN INCHES:

- | | | |
|---|---|--|
| 0 to 1 | -1 to -2 | -3 to -4 |
| 0 to -1 | -2 to -3 | -4 to -5 |
- + BENCHMARK

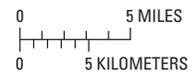
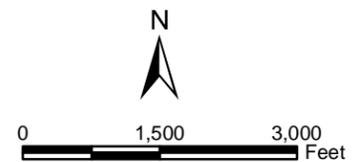
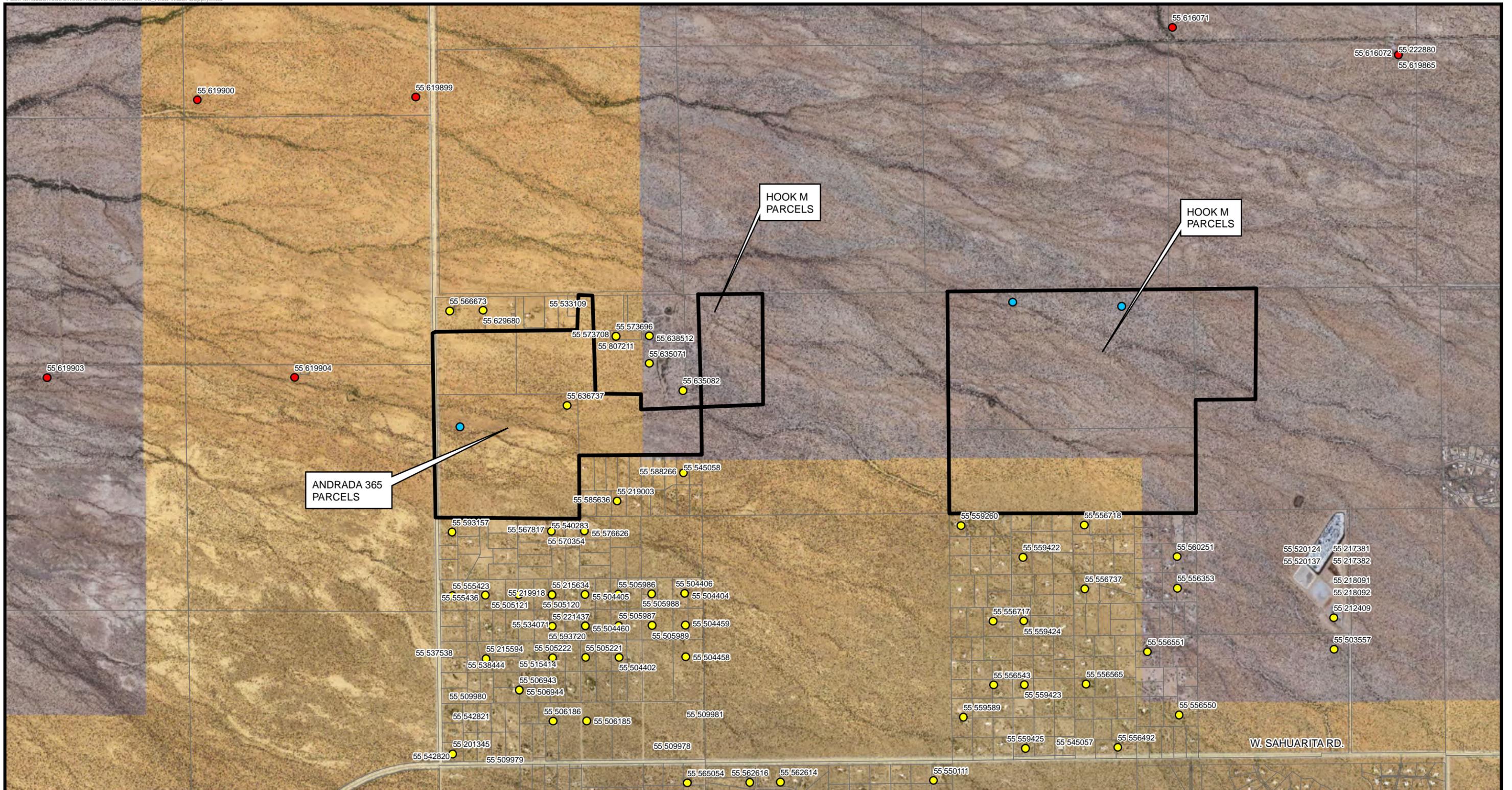


Figure 12. Land-surface elevation change in the Tucson Active Management Area from 1987 to 2004 and 2005.



Legend	
	Proposed CC&N Boundary
	Proposed Wells
	Exempt Wells
	Non-Exempt Wells

ANDRADA 365
Preliminary Integrated Water
Management Plan (PIWMP)
AREA WATER SUPPLY
EXHIBIT 13

ATTACHMENT A

**RED ROCK
SERVE LETTER**



red rock utilities

WATER • WASTEWATER • RECLAIMED WATER

May 29, 2016

Robert Tucker
Andrada Wilmot 180, LLC
2200 E. River Road, Suite 115
Tucson, Az 85718

Re: Will Serve Notification – Water Service for Parcel Numbers 305-23-018A, 305-23-018C, 305-23-027B & 305-23-0260

Dear Mr. Tucker:

Red Rock Utilities, LLC (hereinafter referred to as “the Utility”), has received and reviewed your request for water service, and has determined that the subject property is not located within the boundaries of the current Certificate of Convenience and Necessity of the Utility as defined by the Arizona Corporation Commission (“ACC”). However, the Utility will provide service to the property subject to obtaining a new Certificate of Convenience and Necessity for the property from the ACC authorizing an expansion of its water service area to allow the provision of potable water service to future customers on your parcel.

The landowner will be subject to the regulations, statutes, orders and/or directives from any entity with regulatory/statutory authority over the Utility and the conditions under which it may provide service to the subject property.

We look forward to working with you in the development and implementation of your property.

Sincerely,

Red Rock Utilities, LLC



Mark Weinberg, General Manager

ANDRADA WILMOT 180, LLC

**2200 E. River Road, #115
Tucson, AZ 85718**

May 25, 2016

Mark Weinberg
Red Rock Utilities
General Manager
33786 S. Spirit Lane
Red Rock, Az 85415

Re: Water Availability Letter for Parcel Numbers 305-23-018A, 305-23-018C, 305-23-027B & 305-23-0260

Dear Mr. Weinberg:

Andrada Wilmot 180, LLC is the owner of approximately 365 acres of land located south of Andrada Road and along the east side of Wilmot Road. Attached is a map of the property.

By this letter we are requesting that Red Rock Utilities provide water service to the property.

If you have any questions, please contact me at (520) 577-0200.

Sincerely,



Robert Tucker
Project Manager, Diamond Ventures, Inc.
Manager of Owner

Subject Property
(Andrada Wilmot 180, LLC)

Andrada Road

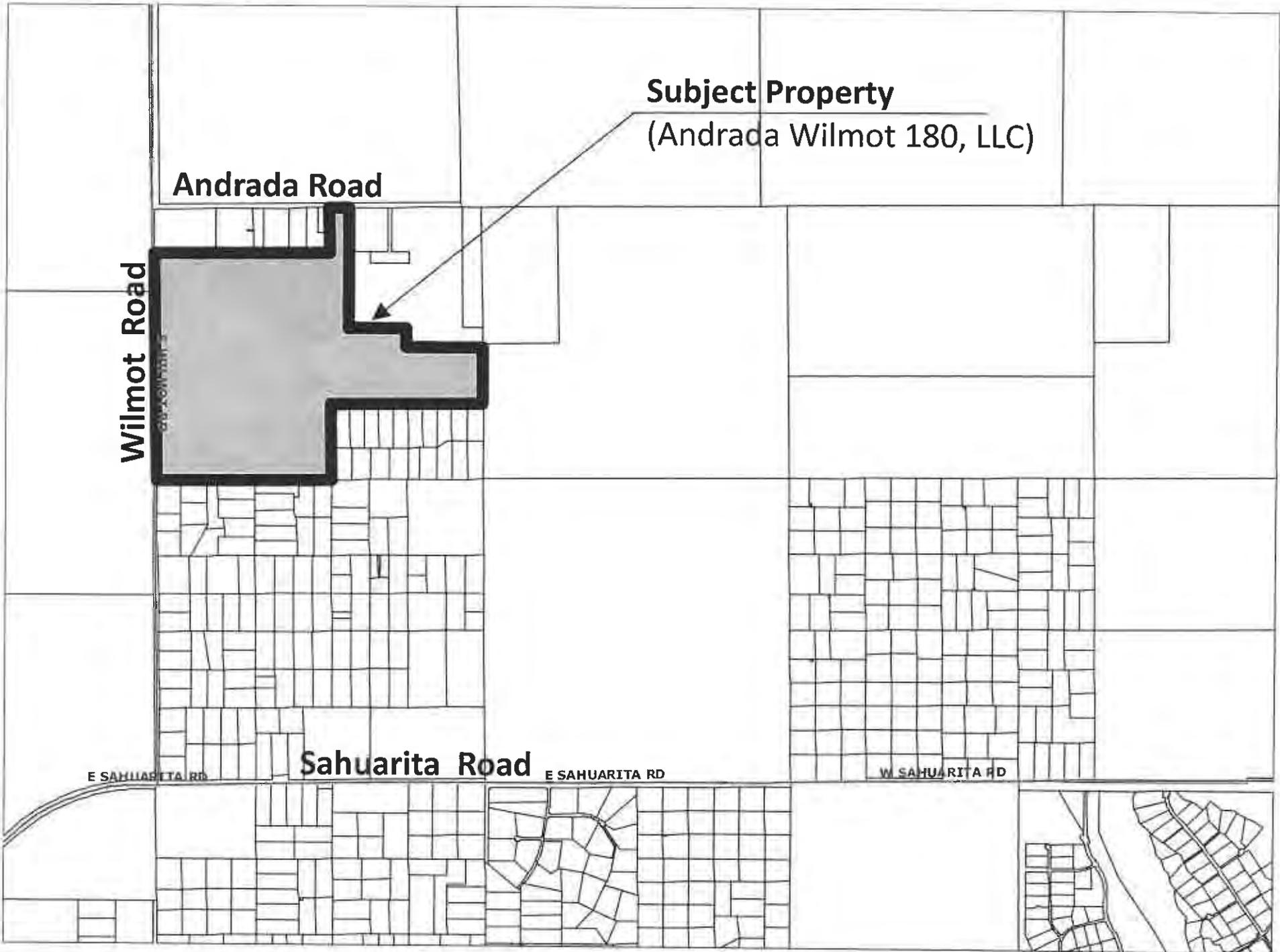
Wilmot Road

Sahuarita Road

E SAHUARITA RD

E SAHUARITA RD

W SAHUARITA RD



ATTACHMENT B

**ADWR DEMAND
CALCULATOR**

June 20, 2016

PROJECT SITE INFORMATION

Name of Proposed Project:

ANDRADA 365

	TOTAL ACRES	Acres in Turf	Acres in LWU	Acres NWU
Residential acres				
Single family acres*	192.00			
Multi-family acres**				
Total residential acres	192.00			
Non-residential acres				
Right of way acres	25.00		10.00	15.00
Commercial acres				
Golf course acres				
Common area acres				
Detention/Retention basin acres				
Park acres				
School acres				
Other non-residential acres	148.00			148.00
Total non-residential tract acres	173.00			
Total Project Acres	365.00			
Number of golf course holes				

*Single family acres is the square footage of all single family lots converted into acres.

**Multi-family acres is the square footage of all multi-family tracts converted into acres.

NOTE: LWU = Low water use landscape, NWU = No water use (hardscape or unwatered native vegetation)

PLEASE FILL OUT AND PRINT BOTH WORKSHEETS AND ATTACH TO YOUR APPLICATION!

June 20, 2016	PROJECT DEMAND CALCULATOR					
Name of Proposed Project:	ANDRADA 365					
INSTRUCTIONS: This spreadsheet is designed to help you calculate the water demand for your proposed development for purposes of applying for a Certificate of Assured Water Supply, Water Adequacy Report or Analysis of Assured (or Adequate) Water Supply. Please enter information into the blue boxes as applicable. If you need help with this form, please contact the Office of Assured and Adequate Water Supply at (602) 771-8599.						
NOTE: This sheet, when completed, does not constitute approval of the demand estimate for your proposed development. It is intended for general estimation purposes only. The final, official demand estimates will be determined by the Department upon review of your complete application.						
Enter the AMA the subdivision is located in*:	TUC	* Enter PHX for Phoenix, TUC for Tucson, PIN for Pinal, PRE for Prescott or SCR for Santa Cruz.				
If you are not sure if your are located inside or outside of an AMA, contact the Office of Assured and Adequate Water Supply at (602) 771-8599.						
Enter the COUNTY the subdivision is located in:	PIMA	* Enter either APACHE, COCHISE, COCONINO, GILA, GRAHAM, GREENLEE, LA PAZ, MARICOPA, MOHAVE, NAVAJO, PIMA, PINAL, SANTA CRUZ, YAVAPAI, or YUMA.				
Residential Usage*						
Category	PPHU	GPCD or per house/day	Demand/HU/YR (af/yr)	No. HU (Lots)	Residential Demand/Yr (af/yr)	
Single Family (int)	2.20	45.00	0.11	800.00	88.72	
Multi-Family (int)		45.00	0.00		0.00	
Single Family Landscape (ext)	1.00	60.00	0.07	800.00	53.77	
Multi-Family Landscape (ext)	0.00	21.00	0.00	0.00	0.00	
Single family Demand/HU/YR				0.30		
Multifamily Demand/HU/YR				0.00		
	Square Feet	Acres	Demand Factor (af/yr)	No. HU (Lots)	Large Lot Adjustment Demand/Yr (af/yr)	
Average Lot Size (sq. ft)**	43560.00	1.00				
TMP Model Lot Size (sq. ft)	7,500 - 10,000	0.17 - 0.23				
Large Lot Adjustment	33560.00	0.77				
1/2 low water use	16780.00	0.39	1.50	40.00	23.11	
1/2 turf	16780.00	0.39	4.60	40.00	70.88	
**NOTE: If the subdivision contains several groupings of lot sizes, the large lot adjustment needs to be calculated for each grouping of large lot sizes. If CC&Rs with landscaping restrictions for the residential lots will be adopted, a modified large lot adjustment can be calculated based on the specific landscaping restrictions. Contact the Office of Assured and Adequate Water Supply for assistance in calculating the large lot adjustment for subdivisions with several groupings of large lot sizes or if CC&Rs limiting landscaping within the residential lots will be adopted.						
Total Residential Demand					236.47	
Non-Residential Usage***						
For each category please enter either square feet or acres of land for that type of non-residential use within your subdivision						
Category	Square Feet	Acres	Demand Factor (af/ac)		Non-Residential Demand (af/yr)	
Common Area1		0.00	1.50 low water use		0.00	
Common Area2		0.00	4.60 turf		0.00	
Right of Way	435600.00	10.00	1.50 low water use		15.00	
Golf Course		0.00	AMA Turf Program - contact AMA		0.00	
Commercial use		0.00	1.67 all acres		0.00	
Public Pool (length x width = square feet)		0.00	Based on closest AMA pool		0.00	
Parks1		0.00	1.50 low water use		0.00	
Parks2		0.00	4.60 turf		0.00	
Retention/Detention Basins		0.00	1.50 low water use		0.00	
Retention/Detention Basins		0.00	4.60 turf		0.00	
School Landscape1		0.00	1.50 low water use		0.00	
School Landscape2		0.00	4.60 turf		0.00	
	Number of students					
Elementary school interior use	0.00		25 GPCD interior demand		0.00	
Middle/High School interior use	0.00		43 GPCD interior demand		0.00	
***NOTE: If your application is for a change of ownership from a previously issued Certificate of Assured Water Supply, and is for only a portion of the original Certificate, contact the Office of Assured and Adequate Water Supply to pro-rate non-residential area acreage.						
Total Non-Residential Demand					15.00	
Distribution Losses						
	Residential	Non-Residential	Total	Loss Factor %	Distribution Losses (af/yr)	
Demand af/yr	236.47	15.00	251.47	10.00	25.15	
Construction						
	No. of Lots	Demand (gals/lot)	100 yr demand (af)		Construction Demand (af/yr)	
	800.00	10000.00	25.89		0.26	
Total Demand Per Year						
Residential Usage af/yr	236.47	Non-Residential Usage 15.00	Lost & Unaccounted for 25.15	Construction 0.26	Total Non-Res 40.41	Total Demand Per Year (af/yr) 276.88
Residential Usage GPCD	120					Total Demand GPCD 140
Annual Build Out Demand	276.88					

ATTACHMENT C

**WATER CONSERVATION
MEASURE**

Table B - Water Conservation Measures

Indoor and Outdoor Options

(15-point Minimum; Must include at least one Outdoor Conservation Measure)

		Possible Points	Points Achieved
Indoor Options			
I-1	Install grey water plumbing lines, labeled and stubbed out to exterior of residence	1	1
I-2	Install a "central-core" plumbing system with all water-using fixture fittings ≤5 ft. from HW heater	1	
I-3	Install a manifold "home run" structured plumbing system; with fixtures ≤ 10 ft. of circulation loop & branch lines ≤ 1/2" in diameter	2	
I-4	Install a manual or motion activated on-demand hot water circulation pumping system	2	2
I-5	Install a point-of-use tankless hot water heater that uses only cold water supply or solar-assisted preheating for any fixture > 20 pipe run feet from water heater	3	
I-6	Install lavatory faucets that meet the proposed EPA's WaterSense™ criteria or have a maximum flow rate of 1.5 gpm @ 80 psi of pressure	3	3
I-7	Install showerheads that meet the proposed EPA's WaterSense™ criteria or have a maximum flow rate of 1.5 gpm @ 80 psi of pressure	3	3
I-8	Install toilets that meet the EPA's WaterSense™ rating (1.28 gpf) OR	3	3
I-9	Install dual flush toilets with 1.6 gpf/.8 gpf or less water use	3	
I-10	Install a washing machine with a water factor of 6.0 or less	2	
I-11	Install composting toilet(s), 2 pts/fixture; no maximum	2	
I-12	Install a refrigerator with an in-door filtered water system	0.5	
I-13	Install excess flow check valves or excess water shutoff connectors at fixtures	3	
I-14	No garbage disposal	1	
Outdoor Options			
O-1	Install a rainwater harvesting system capable of retaining and storing 50% or more of the average annual available rainfall on the catchment surface. (min. Catchment Area = 500 ft.)	6	
O-2	Install a rainwater harvesting system capable of retaining and storing 25% or more of the average annual available rainfall on the catchment surface. (min. Catchment Area = 500 ft.)	4	
O-3	Install a rainwater harvesting system capable of retaining and storing 10% or more of the average annual available rainfall on the catchment surface. (min. Catchment Area = 500 ft.)	2	2
O-4	Install a gutter and downspout system or canals that tie to storm water infiltration trenches, bioswales, or rain gardens	2	2
O-5	Install grey water plumbing lines, labeled and stubbed out to exterior of residence, but with connection to an onsite landscaping drip irrigation system	2	
O-6	No swimming pool	2	
O-7	No decorative water features or mister systems that use potable water.	1	1
O-8	Impervious driveway & walkway surfaces shall be <5% of total site area (≤ 5 acres); OR 1% of the site area (over 5 acres)	2	
O-9	Construct no impervious surfaces outside the building footprint	2	
O-10	Install a vegetative roof system (min 50% of roof area) to reduce impervious surfaces	3	
O-11	Install drought-tolerant, non-irrigated landscaping design by a licensed landscape professional	3	
O-12	Install drought-tolerant, non-irrigated landscaping design by a licensed landscape professional. Plant species limited to native plants only.	4	
O-13	Irrigation system designed and installed by an EPA Watersense™ certified professional	1	
O-14	Provide recharge/retention plan for rainwater	1	
O-15	Install a high efficiency irrigation system that uses:		
	a. "Smart Controllers" (w/ moisture sensor and rain delay controllers) & high efficiency nozzles;	0.5	
	b. Check valves in heads and heads matched to the beds distinct watering needs;	0.5	
	c. Separate sprinkler zones for beds, with plants grouped based on watering needs (hydrozoning);	0.5	
	d. A timer/controller that irrigates during the hours of 1- pm-8am to minimize evaporation;	0.5	
	e. Drip irrigation for all planting beds;	0.5	

or

ATTACHMENT D

**TUCSON WATER
LETTER**

ANDRADA INVESTORS, LLC

**2200 E. River Road, #115
Tucson, AZ 85718**

April 1, 2011

Joseph G. Olsen, P.E.
Tucson Water Department
Interim Planning Administrator
P.O. Box 27210
Tucson, Az 85726-7210

Re: Water Availability Letter for Parcel Numbers 305-22-0030, 305-22-004A, 305-22-004B, 305-22-0050, 305-23-0140

Dear Mr. Olsen:

Andrada Investors, LLC is the owner of approximately 716 acres of land located in unincorporated Pima County, on the south side of Andrada Road between Wilmot and Houghton roads. Attached is a map of the property.

We are evaluating our options for water service for the property and would like to discuss Tucson Water's interest in providing water service in this area.

If you have any questions, please contact me at (520) 577-0200.

Sincerely,



Robert Tucker
Project Manager, Diamond Ventures, Inc.
Manager of Owner

FILE



CITY OF
TUCSON
TUCSON WATER
DEPARTMENT

April 1, 2011

Andrada Investors, LLC.
2200 E. River Road, Suite 115
Tucson, AZ 85718

Attn: Robert Tucker

SUBJECT: Water Availability for project: Hook M Ranch 0030, 004A, 004B, 0140, 0050, APN: 305220030, 30522004A, 305220050, 305230140, 30522004B, Case #: N/A, T-17, R-15, SEC-03, Lots: 9999, Location Code: , Total Area: 735.16ac, Zoning: RH

Tucson Water has no current plans to provide water service to this area. Please contact the Arizona Corporation Commission at 628-6550 to determine if another water provider is close to the subject property.

If you have any questions, please call me at New Development at 791-4718.

Sincerely,

A handwritten signature in cursive script, appearing to read "Joseph G. Olsen".

Joseph G. Olsen, P.E.
Planning Administrator
Tucson Water Department

JGO:bjp

CC: File

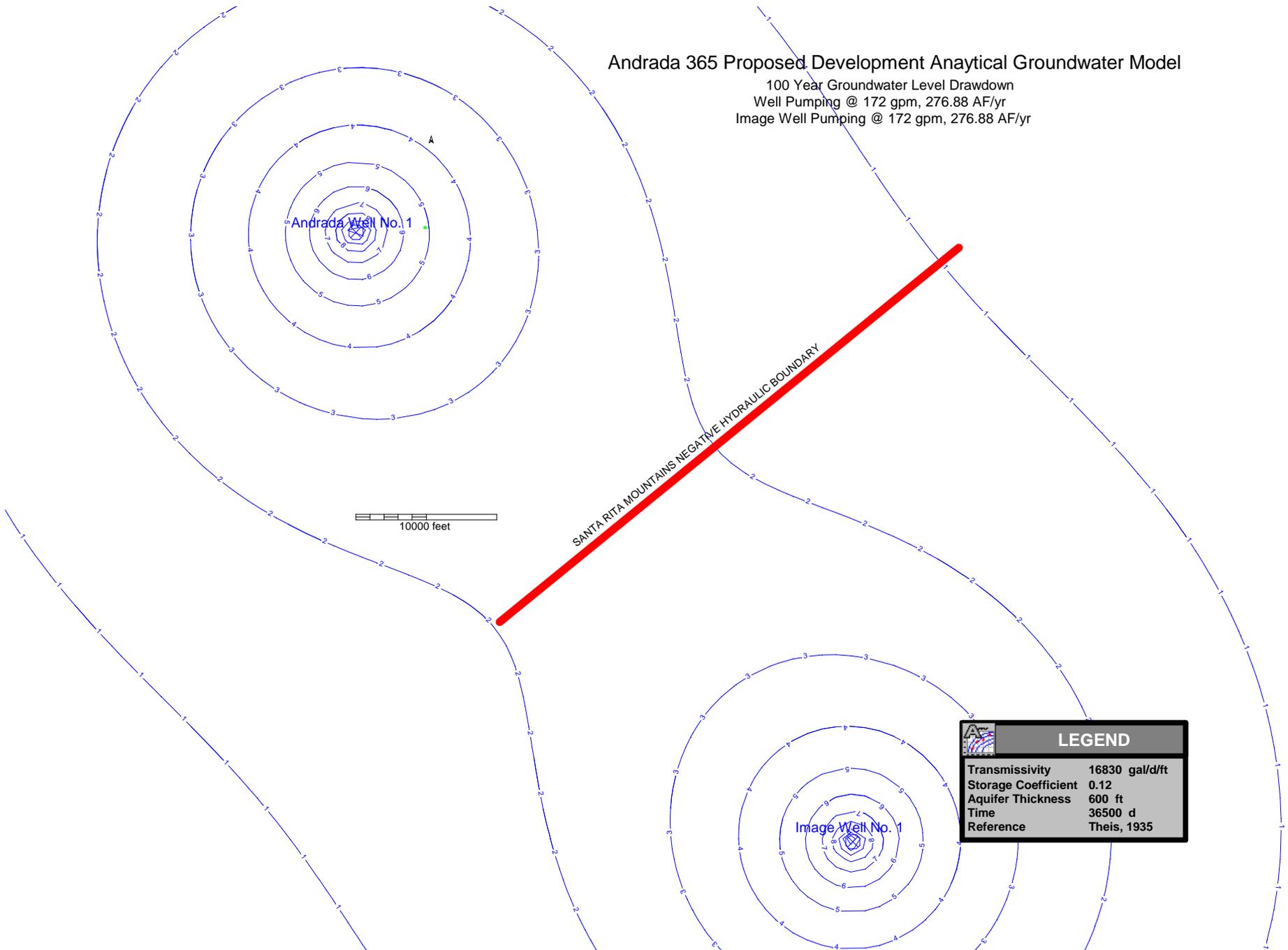


ATTACHMENT E

**DRAWDOWN CONTOUR
MAP AND
GROUNDWATER
MODEL OUTPUT**

Andrada 365 Proposed Development Analytical Groundwater Model

100 Year Groundwater Level Drawdown
Well Pumping @ 172 gpm, 276.88 AF/yr
Image Well Pumping @ 172 gpm, 276.88 AF/yr



LEGEND	
Transmissivity	16830 gal/d/ft
Storage Coefficient	0.12
Aquifer Thickness	600 ft
Time	36500 d
Reference	Theis, 1935

=====

AquiferWin32
Analytical Simulation of Groundwater Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

(c) 1997-2011 Environmental Simulations, Inc.

=====

Date: 6/13/2016

Time: 08:37:25.00

Input File: ANDRADA_365

=====

Aquifer Properties

Transmissivity

Specified Value = 16830 gal/d/ft

Storage Coefficient

Specified Value = 0.12

Porosity

Specified Value = 0.2

Aquifer Thickness

Specified Value = 600 ft

=====

=====

Pumping Wells

Well: Andrada Well No. 1 (1.68518e+006, 1.16097e+007) ft

Variable Pumping Rates

Time	Pumping Rate
(d)	(gal/min)
0	172
36500	172

Well: Image Well No. 1 (1.72047e+006, 1.15664e+007) ft

Variable Pumping Rates

Time (d)	Pumping Rate (gal/min)
0	172
36500	172

=====

Calibration Targets

=====

Contour Matrix

Number of nodes in the X-direction = 100

Number of nodes in the Y-direction = 100

Minimum X Coordinate = 1656050.000000 ft

Minimum Y Coordinate = 11556553.640000 ft

Maximum X Coordinate = 1757047.310000 ft

Maximum Y Coordinate = 11627813.620000 ft

Minimum Drawdown = 0.125716 ft

Maximum Drawdown = 11.882784 ft

Drawdown Matrix (ft)

Row 1

0.257705	0.270609	0.284027	0.297976	0.312473
0.327534	0.343180	0.359428	0.376300	0.393817
0.412003	0.430882	0.450481	0.470828	0.491954
0.513891	0.536673	0.560338	0.584926	0.610480
0.637046	0.664674	0.693417	0.723333	0.754481
0.786928	0.820743	0.856000	0.892779	0.931164
0.971244	1.013115	1.056877	1.102636	1.150504
1.200597	1.253040	1.307960	1.365490	1.425768
1.488934	1.555130	1.624499	1.697179	1.773301
1.852986	1.936332	2.023407	2.114234	2.208772
2.306892	2.408342	2.512703	2.619335	2.727310
2.835335	2.941670	3.044059	3.139699	3.225278
3.297141	3.351598	3.385375	3.396124	3.382857
3.346138	3.287973	3.211437	3.120165	3.017877
2.908021	2.793569	2.676949	2.560060	2.444329
2.330797	2.220193	2.113009	2.009555	1.910007
1.814442	1.722868	1.635241	1.551486	1.471499
1.395165	1.322359	1.252951	1.186808	1.123798
1.063792	1.006664	0.952289	0.900549	0.851329

0.804518 0.760010 0.717703 0.677500 0.639306

Row 2

0.265011 0.278229 0.291969 0.306246 0.321078

0.336482 0.352474 0.369076 0.386307 0.404188

0.422743 0.441997 0.461975 0.482706 0.504220

0.526551 0.549732 0.573802 0.598801 0.624772

0.651764 0.679827 0.709015 0.739387 0.771006

0.803940 0.838262 0.874050 0.911386 0.950359

0.991065 1.033604 1.078084 1.124618 1.173328

1.224342 1.277794 1.333827 1.392589 1.454237

1.518932 1.586842 1.658136 1.732988 1.811567

1.894036 1.980547 2.071227 2.166167 2.265404

2.368891 2.476469 2.587811 2.702363 2.819261

2.937232 3.054476 3.168552 3.276294 3.373814

3.456646 3.520126 3.559993 3.573123 3.558182

3.515929 3.449042 3.361547 3.258080 3.143227

3.021081 2.895040 2.767759 2.641229 2.516879

2.395694 2.278325 2.165172 2.056452 1.952257

1.852585 1.757375 1.666521 1.579894 1.497346

1.418723 1.343864 1.272611 1.204806 1.140296

1.078933 1.020574 0.965081 0.912323 0.862175

0.814516 0.769233 0.726216 0.685362 0.646570

Row 3

0.272492	0.286031	0.300100	0.314712	0.329886
0.345636	0.361982	0.378943	0.396537	0.414787
0.433715	0.453346	0.473705	0.494821	0.516725
0.539448	0.563025	0.587496	0.612900	0.639281
0.666689	0.695175	0.724794	0.755608	0.787680
0.821082	0.855887	0.892179	0.930042	0.969572
1.010866	1.054034	1.099188	1.146451	1.195952
1.247830	1.302232	1.359315	1.419243	1.482190
1.548342	1.617889	1.691032	1.767979	1.848939
1.934125	2.023744	2.117989	2.217027	2.320986
2.429922	2.543789	2.662386	2.785284	2.911734
3.040540	3.169901	3.297237	3.419027	3.530730
3.626888	3.701558	3.749108	3.765299	3.748289
3.699123	3.621455	3.520645	3.402664	3.273184
3.137050	2.998089	2.859154	2.722268	2.588802
2.459635	2.335294	2.216052	2.102012	1.993158
1.889397	1.790587	1.696556	1.607116	1.522069
1.441220	1.364372	1.291336	1.221929	1.155976
1.093310	1.033771	0.977208	0.923478	0.872444
0.823978	0.777956	0.734264	0.692791	0.653431

Row 4

0.280152	0.294020	0.308424	0.323378	0.338900
0.355005	0.371710	0.389035	0.406998	0.425621
0.444926	0.464937	0.485680	0.507182	0.529474
0.552589	0.576560	0.601427	0.627231	0.654015
0.681830	0.710727	0.740764	0.772002	0.804508

0.838354	0.873618	0.910385	0.948745	0.988794
1.030639	1.074392	1.120173	1.168113	1.218349
1.271031	1.326318	1.384379	1.445397	1.509563
1.577084	1.648178	1.723076	1.802020	1.885265
1.973071	2.065706	2.163437	2.266515	2.375170
2.489579	2.609835	2.735895	2.867506	3.004095
3.144622	3.287374	3.429715	3.567818	3.696442
3.808936	3.897664	3.955070	3.975266	3.955643
3.897680	3.806481	3.689319	3.553958	3.407422
3.255386	3.102086	2.950490	2.802566	2.659542
2.522125	2.390666	2.265276	2.145911	2.032432
1.924640	1.822302	1.725174	1.633003	1.545540
1.462545	1.383786	1.309042	1.238104	1.170774
1.106867	1.046206	0.988628	0.933975	0.882103
0.832872	0.786153	0.741823	0.699765	0.659870

Row 5

0.287995	0.302199	0.316946	0.332250	0.348127
0.364592	0.381663	0.399358	0.417696	0.436698
0.456384	0.476778	0.497907	0.519797	0.542478
0.565983	0.590347	0.615606	0.641803	0.668983
0.697194	0.726490	0.756929	0.788574	0.821494
0.855762	0.891458	0.928670	0.967492	1.008025
1.050378	1.094669	1.141027	1.189587	1.240497
1.293917	1.350015	1.408977	1.470998	1.536292
1.605084	1.677620	1.754160	1.834983	1.920388
2.010688	2.106214	2.207308	2.314317	2.427582

2.547418	2.674082	2.807728	2.948329	3.095565
3.248649	3.406084	3.565322	3.722341	3.871222
4.003912	4.110563	4.180859	4.206410	4.183399
4.113991	4.005524	3.868057	3.711779	3.545346
3.375303	3.206194	3.040963	2.881390	2.728455
2.582609	2.443969	2.312441	2.187810	2.069792
1.958070	1.852314	1.752198	1.657404	1.567629
1.482588	1.402011	1.325646	1.253258	1.184628
1.119549	1.057832	0.999298	0.943779	0.891118
0.841171	0.793798	0.748870	0.706265	0.665869

Row 6

0.296025	0.310573	0.325671	0.341332	0.357571
0.374404	0.391849	0.409920	0.428639	0.448023
0.468095	0.488878	0.510395	0.532675	0.555747
0.579642	0.604394	0.630042	0.656626	0.684193
0.712790	0.742473	0.773300	0.805334	0.838646
0.873311	0.909411	0.947037	0.986285	1.027261
1.070078	1.114859	1.161738	1.210859	1.262377
1.316461	1.373292	1.433067	1.495998	1.562316
1.632268	1.706124	1.784176	1.866740	1.954155
2.046791	2.145043	2.249333	2.360107	2.477828
2.602962	2.735957	2.877197	3.026940	3.185198
3.351565	3.524926	3.703031	3.881894	4.055053
4.212922	4.342782	4.430322	4.463220	4.435681
4.351000	4.220078	4.057122	3.875574	3.685989
3.495694	3.309328	3.129588	2.957884	2.794812

2.640475	2.494691	2.357123	2.227355	2.104944
1.989441	1.880414	1.777453	1.680171	1.588211
1.501242	1.418955	1.341070	1.267324	1.197477
1.131306	1.068603	1.009178	0.952852	0.899460
0.848846	0.800866	0.755383	0.712272	0.671411

Row 7

0.304246	0.319147	0.334603	0.350629	0.367239
0.384448	0.402272	0.420728	0.439833	0.459607
0.480070	0.501245	0.523154	0.545826	0.569289
0.593573	0.618712	0.644744	0.671711	0.699656
0.728630	0.758686	0.789885	0.822289	0.855972
0.891008	0.927484	0.965491	1.005128	1.046504
1.089738	1.134957	1.182299	1.231916	1.283971
1.338642	1.396119	1.456614	1.520351	1.587579
1.658567	1.733609	1.813025	1.897166	1.986417
2.081199	2.181972	2.289241	2.403554	2.525501
2.655713	2.794845	2.943548	3.102414	3.271883
3.452061	3.642429	3.841337	4.045212	4.247411
4.436872	4.597296	4.708521	4.751831	4.718009
4.612319	4.451592	4.256322	4.044229	3.827875
3.615058	3.410121	3.215189	3.031065	2.857804
2.695061	2.542294	2.398881	2.264186	2.137588
2.018506	1.906398	1.800768	1.701161	1.607164
1.518402	1.434530	1.355237	1.280236	1.209266
1.142086	1.078476	1.018232	0.961164	0.907099
0.855873	0.807335	0.761343	0.717766	0.676480

Row 8

0.312663	0.327924	0.343747	0.360147	0.377136
0.394729	0.412941	0.431788	0.451287	0.471457
0.492317	0.513888	0.536194	0.559261	0.583115
0.607788	0.633313	0.659726	0.687068	0.715385
0.744725	0.775142	0.806696	0.839452	0.873482
0.908865	0.945685	0.984038	1.024025	1.065759
1.109360	1.154960	1.202705	1.252751	1.305267
1.360441	1.418473	1.479585	1.544016	1.612032
1.683919	1.759995	1.840609	1.926146	2.017030
2.113736	2.216787	2.326767	2.444328	2.570191
2.705157	2.850101	3.005967	3.173731	3.354338
3.548557	3.756704	3.978119	4.210222	4.446899
4.676124	4.877479	5.022270	5.080943	5.037993
4.902342	4.701177	4.464635	4.215778	3.968852
3.731419	3.506897	3.296397	3.099835	2.916557
2.745671	2.586220	2.437268	2.297939	2.167433
2.045026	1.930068	1.821978	1.720235	1.624372
1.533970	1.448652	1.368076	1.291932	1.219941
1.151846	1.087412	1.026424	0.968684	0.914008
0.862227	0.813184	0.766732	0.722733	0.681061

Row 9

0.321278	0.336909	0.353109	0.369891	0.387268
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0.405253	0.423861	0.443108	0.463009	0.483582
0.504845	0.526818	0.549524	0.572989	0.597237
0.622299	0.648208	0.674999	0.702712	0.731392
0.761087	0.791852	0.823746	0.856834	0.891189
0.926890	0.964025	1.002688	1.042985	1.085030
1.128946	1.174872	1.222954	1.273356	1.326255
1.381843	1.440332	1.501953	1.566959	1.635629
1.708268	1.785214	1.866843	1.953571	2.045862
2.144237	2.249281	2.361655	2.482109	2.611495
2.750780	2.901069	3.063609	3.239794	3.431141
3.639212	3.865408	4.110517	4.373736	4.650695
4.929804	5.186802	5.380926	5.463487	5.406473
5.226192	4.968947	4.679589	4.387032	4.105927
3.842279	3.597674	3.371673	3.163006	2.970153
2.791592	2.625911	2.471842	2.328265	2.194194
2.068769	1.951235	1.840928	1.737265	1.639728
1.547858	1.461245	1.379521	1.302358	1.229456
1.160543	1.095374	1.033723	0.975383	0.920164
0.867889	0.818395	0.771532	0.727158	0.685141

Row 10

0.330097	0.346106	0.362692	0.379866	0.397640
0.416027	0.435042	0.454697	0.475008	0.495991
0.517663	0.540045	0.563156	0.587022	0.611667
0.637119	0.663411	0.690577	0.718656	0.747692
0.777732	0.808832	0.841049	0.874450	0.909106
0.945099	0.982516	1.021453	1.062017	1.104326

1.148505	1.194695	1.243048	1.293732	1.346929
1.402840	1.461682	1.523698	1.589151	1.658333
1.731565	1.809205	1.891651	1.979347	2.072793
2.172553	2.279268	2.393669	2.516599	2.649028
2.792090	2.947104	3.115624	3.299470	3.500770
3.721968	3.965765	4.234850	4.531137	4.853785
5.194502	5.527820	5.797538	5.919903	5.839476
5.589136	5.252662	4.896329	4.553157	4.235134
3.944611	3.680203	3.439351	3.219340	3.017661
2.832117	2.660825	2.502182	2.354830	2.217607
2.089524	1.969727	1.857478	1.752134	1.653134
1.559982	1.472239	1.389516	1.311463	1.237766
1.168141	1.102331	1.040102	0.981239	0.925545
0.872838	0.822951	0.775729	0.731027	0.688710

Row 11

0.339122	0.355521	0.372503	0.390078	0.408260
0.427059	0.446489	0.466561	0.487291	0.508692
0.530782	0.553578	0.577101	0.601373	0.626417
0.652261	0.678936	0.706474	0.734914	0.764299
0.794676	0.826097	0.858621	0.892315	0.927250
0.963506	1.001172	1.040346	1.081135	1.123658
1.168045	1.214438	1.262992	1.313881	1.367290
1.423426	1.482514	1.544804	1.610570	1.680114
1.753772	1.831917	1.914967	2.003392	2.097720
2.198553	2.306582	2.422598	2.547525	2.682442
2.828626	2.987600	3.161197	3.351648	3.561679

3.794646 4.054661 4.346659 4.676161 5.048034
5.462042 5.899312 6.290080 6.485375 6.361571
5.994247 5.545106 5.106368 4.707315 4.351537
4.034959 3.752064 3.497723 3.267609 3.058184
2.866579 2.690455 2.527899 2.377332 2.237434
2.107100 1.985390 1.871501 1.764739 1.664505
1.570271 1.481576 1.398008 1.319204 1.244835
1.174608 1.108256 1.045537 0.986230 0.930133
0.877060 0.826839 0.779311 0.734329 0.691756

Row 12

0.348357 0.365156 0.382544 0.400533 0.419133
0.438355 0.458210 0.478709 0.499867 0.521696
0.544212 0.567430 0.591370 0.616053 0.641501
0.667739 0.694797 0.722706 0.751504 0.781231
0.811934 0.843665 0.876481 0.910448 0.945637
0.982128 1.020011 1.059384 1.100354 1.143043
1.187580 1.234112 1.282797 1.333809 1.387340
1.443601 1.502824 1.565264 1.631203 1.700952
1.774859 1.853311 1.936741 2.025639 2.120557
2.222129 2.331083 2.448262 2.574655 2.711431
2.859986 3.022014 3.199589 3.395294 3.612395
3.855089 4.128856 4.440953 4.801021 5.221505
5.716206 6.288969 6.880304 7.228563 7.010760
6.434861 5.829626 5.296394 4.840658 4.449461
4.109657 3.810835 3.545142 3.306664 3.090903
2.894378 2.714356 2.548655 2.395510 2.253471

2.121336	1.998095	1.882892	1.774994	1.673769
1.578667	1.489204	1.404956	1.325545	1.250633
1.179917	1.113124	1.050007	0.990338	0.933912
0.880540	0.830045	0.782267	0.737056	0.694273

Row 13

0.357807	0.375017	0.392823	0.411237	0.430266
0.449921	0.470212	0.491150	0.512746	0.535012
0.557963	0.581612	0.605977	0.631077	0.656933
0.683569	0.711011	0.739290	0.768442	0.798507
0.829527	0.861556	0.894648	0.928868	0.964288
1.000987	1.039053	1.078586	1.119693	1.162496
1.207127	1.253733	1.302474	1.353528	1.407090
1.463374	1.522616	1.585076	1.651043	1.720836
1.794810	1.873362	1.956938	2.046040	2.141242
2.243199	2.352665	2.470522	2.597807	2.735753
2.885846	3.049904	3.230182	3.429533	3.651637
3.901358	4.185302	4.512734	4.897128	5.358881
5.929844	6.657802	7.574418	8.314201	7.835691
6.873806	6.074846	5.448263	4.943070	4.523088
4.165201	3.854311	3.580163	3.335526	3.115129
2.915020	2.732163	2.564176	2.409154	2.265553
2.132101	2.007738	1.891568	1.782831	1.680871
1.585122	1.495085	1.410326	1.330458	1.255134
1.184048	1.116919	1.053497	0.993551	0.936872
0.883268	0.832562	0.784590	0.739200	0.696253

Row 14

0.367475	0.385107	0.403344	0.422193	0.441663
0.461764	0.482503	0.503891	0.525937	0.548651
0.572047	0.596136	0.620934	0.646459	0.672729
0.699766	0.727594	0.756244	0.785748	0.816144
0.847475	0.879789	0.913143	0.947598	0.983225
1.020103	1.058320	1.097974	1.139173	1.182039
1.226706	1.273319	1.322043	1.373055	1.426553
1.482754	1.541897	1.604247	1.670094	1.739764
1.813617	1.892057	1.975536	2.064568	2.159736
2.261707	2.371255	2.489282	2.616853	2.755237
2.905973	3.070949	3.252526	3.453711	3.678430
3.931944	4.221544	4.557759	4.956602	5.444169
6.067205	6.921754	8.247579	10.341521	8.776768
7.206243	6.235020	5.542007	5.004980	4.567387
4.198734	3.880759	3.601681	3.353457	3.130355
2.928144	2.743613	2.574263	2.418114	2.273565
2.139305	2.014246	1.897470	1.788201	1.685771
1.589603	1.499192	1.414096	1.333923	1.258324
1.186986	1.119629	1.055997	0.995859	0.939004
0.885238	0.834382	0.786273	0.740757	0.697692

Row 15

0.377365	0.395432	0.414110	0.433408	0.453333
0.473891	0.495091	0.516941	0.539449	0.562623

0.586475	0.611014	0.636255	0.662213	0.688903
0.716346	0.744565	0.773587	0.803441	0.834165
0.865798	0.898388	0.931989	0.966661	1.002473
1.039502	1.077836	1.117573	1.158820	1.201697
1.246340	1.292895	1.341525	1.392411	1.445750
1.501762	1.560686	1.622790	1.688368	1.757745
1.831286	1.909397	1.992535	2.081214	2.176022
2.277632	2.386820	2.504494	2.631725	2.769791
2.920239	3.084972	3.266366	3.467459	3.692214
3.945960	4.236104	4.573386	4.974257	5.465825
6.097655	6.976207	8.406687	11.882784	9.035305
7.274073	6.267805	5.562654	5.019948	4.579177
4.208515	3.889154	3.609053	3.360035	3.136291
2.933545	2.748556	2.578808	2.422306	2.277442
2.142897	2.017578	1.900566	1.791079	1.688447
1.592092	1.501509	1.416252	1.335929	1.260191
1.188723	1.121244	1.057500	0.997256	0.940303
0.886445	0.835503	0.787313	0.741722	0.698587

Row 16

0.387480	0.405994	0.425128	0.444887	0.465279
0.486309	0.507984	0.530309	0.553292	0.576939
0.601259	0.626260	0.651954	0.678354	0.705473
0.733329	0.761943	0.791338	0.821543	0.852591
0.884521	0.917378	0.951212	0.986083	1.022057
1.059211	1.097630	1.137410	1.178660	1.221498
1.266057	1.312486	1.360948	1.411621	1.464706

1.520420	1.579006	1.640729	1.705885	1.774799
1.847836	1.925400	2.007947	2.095990	2.190112
2.290981	2.399365	2.516161	2.642423	2.779409
2.928633	3.091950	3.271669	3.470720	3.692901
3.943265	4.228739	4.559172	4.949203	5.421791
6.015286	6.797143	7.867816	8.915627	8.211079
7.037610	6.164733	5.507483	4.986861	4.557922
4.194257	3.879327	3.602174	3.355190	3.132889
2.931188	2.746968	2.577790	2.421716	2.277172
2.142868	2.017728	1.900848	1.791458	1.688895
1.592586	1.502032	1.416791	1.336474	1.260733
1.189257	1.121766	1.058004	0.997742	0.940767
0.886887	0.835923	0.787710	0.742096	0.698938

Row 17

0.397823	0.416797	0.436400	0.456635	0.477509
0.499025	0.521188	0.544003	0.567475	0.591609
0.616411	0.641887	0.668045	0.694898	0.722455
0.750732	0.779746	0.809519	0.840076	0.871447
0.903669	0.936783	0.970838	1.005891	1.042007
1.079259	1.117731	1.157518	1.198725	1.241472
1.285890	1.332126	1.380342	1.430718	1.483452
1.538761	1.596887	1.658094	1.722675	1.790956
1.863296	1.940096	2.021806	2.108931	2.202043
2.301794	2.408935	2.524334	2.649011	2.784170
2.931255	3.092019	3.268620	3.463763	3.680891
3.924484	4.200492	4.516990	4.885152	5.320498

5.843416	6.471970	7.167219	7.616247	7.331269
6.635418	5.958655	5.387527	4.910339	4.505871
4.157178	3.851992	3.581489	3.339215	3.120349
2.921215	2.738949	2.571286	2.416399	2.272799
2.139250	2.014722	1.898339	1.789355	1.687127
1.591096	1.500771	1.415722	1.335564	1.259957
1.188593	1.121196	1.057513	0.997318	0.940400
0.886567	0.835643	0.787465	0.741879	0.698747

Row 18

0.408396	0.427846	0.447931	0.468657	0.490027
0.512045	0.534712	0.558033	0.582010	0.606645
0.631943	0.657908	0.684544	0.711862	0.739868
0.768575	0.797997	0.828152	0.859063	0.890757
0.923267	0.956632	0.990898	1.026118	1.062354
1.099679	1.138173	1.177929	1.219051	1.261655
1.305873	1.351849	1.399745	1.449737	1.502024
1.556821	1.614366	1.674922	1.738779	1.806257
1.877710	1.953532	2.034161	2.120091	2.211875
2.310143	2.415615	2.529118	2.651615	2.784236
2.928318	3.085464	3.257615	3.447150	3.657022
3.890921	4.153499	4.450579	4.789213	5.176952
5.618144	6.100085	6.551926	6.788373	6.635752
6.201977	5.697298	5.221825	4.799092	4.427480
4.099765	3.808638	3.547939	3.312731	3.099098
2.903927	2.724721	2.559458	2.406481	2.264418
2.132120	2.008618	1.893085	1.784810	1.683177

1.587647	1.497748	1.413062	1.333215	1.257875
1.186742	1.119544	1.056036	0.995992	0.939206
0.885490	0.834669	0.786581	0.741076	0.698015

Row 19

0.419203	0.439142	0.459726	0.480958	0.502841
0.525376	0.548564	0.572407	0.596905	0.622059
0.647869	0.674337	0.701467	0.729263	0.757730
0.786878	0.816717	0.847261	0.878531	0.910549
0.943345	0.976955	1.011421	1.046794	1.083133
1.120506	1.158992	1.198680	1.239673	1.282086
1.326045	1.371696	1.419195	1.468721	1.520465
1.574642	1.631488	1.691260	1.754244	1.820752
1.891132	1.965765	2.045078	2.129544	2.219694
2.316128	2.419525	2.530658	2.650421	2.779843
2.920131	3.072700	3.239224	3.421695	3.622483
3.844387	4.090642	4.364761	4.669928	5.007196
5.370647	5.735987	6.041073	6.182195	6.085584
5.795417	5.418168	5.029779	4.663299	4.328392
4.025337	3.751320	3.502858	3.276637	3.069760
2.879770	2.704609	2.542551	2.392147	2.252173
2.121590	1.999508	1.885160	1.777881	1.677091
1.582280	1.492996	1.408838	1.329449	1.254507
1.183720	1.116825	1.053583	0.993774	0.937196
0.883665	0.833007	0.785065	0.739691	0.696747

Row 20

0.430245	0.450689	0.471787	0.493542	0.515954
0.539024	0.562751	0.587134	0.612171	0.637860
0.664200	0.691190	0.718828	0.747118	0.776061
0.805662	0.835928	0.866870	0.898504	0.930850
0.963932	0.997784	1.032443	1.067956	1.104379
1.141777	1.180226	1.219812	1.260635	1.302806
1.346451	1.391710	1.438740	1.487714	1.538822
1.592275	1.648304	1.707161	1.769126	1.834503
1.903628	1.976870	2.054638	2.137383	2.225609
2.319877	2.420818	2.529145	2.645664	2.771294
2.907087	3.054249	3.214160	3.388391	3.578701
3.786990	4.015139	4.264611	4.535519	4.824590
5.121047	5.399671	5.614195	5.705215	5.636958
5.430377	5.142909	4.826634	4.512426	4.214425
3.937549	3.682408	3.447829	3.232024	3.033108
2.849308	2.679031	2.520879	2.373638	2.236253
2.107809	1.987509	1.874659	1.768647	1.668935
1.575047	1.486559	1.403090	1.324299	1.249879
1.179551	1.113059	1.050173	0.990680	0.934383
0.881101	0.830668	0.782926	0.737733	0.694951

Row 21

0.441525	0.462489	0.484118	0.506413	0.529373
0.552997	0.577281	0.602222	0.627817	0.654062
0.680950	0.708479	0.736645	0.765446	0.794880

0.824949	0.855655	0.887006	0.919012	0.951690
0.985061	1.019151	1.053997	1.089639	1.126131
1.163533	1.201918	1.241368	1.281980	1.323862
1.367136	1.411941	1.458428	1.506769	1.557149
1.609775	1.664872	1.722687	1.783491	1.847579
1.915274	1.986930	2.062936	2.143717	2.229745
2.321540	2.419678	2.524800	2.637622	2.758940
2.889643	3.030713	3.183229	3.348340	3.527218
3.720931	3.930190	4.154836	4.392865	4.638656
4.880126	5.095305	5.251417	5.312994	5.260853
5.106078	4.881664	4.622580	4.354096	4.090836
3.839968	3.604343	3.384552	3.180098	2.990016
2.813182	2.648468	2.494812	2.351241	2.216882
2.090955	1.972765	1.861697	1.757201	1.658787
1.566015	1.478491	1.395861	1.317803	1.244025
1.174262	1.108270	1.045827	0.986727	0.930782
0.877814	0.827663	0.780175	0.735210	0.692635

Row 22

0.453044	0.474545	0.496723	0.519576	0.543103
0.567299	0.592160	0.617681	0.643855	0.670674
0.698132	0.726221	0.754934	0.784265	0.814208
0.844761	0.875922	0.907694	0.940084	0.973101
1.006764	1.041094	1.076121	1.111885	1.148431
1.185818	1.224113	1.263395	1.303757	1.345303
1.388153	1.432441	1.478315	1.525941	1.575503
1.627201	1.681255	1.737904	1.797410	1.860058

1.926156	1.996041	2.070080	2.148671	2.232249
2.321288	2.416308	2.517876	2.626607	2.743174
2.868298	3.002740	3.147284	3.302685	3.469582
3.648333	3.838721	4.039430	4.247196	4.455478
4.652766	4.821258	4.937958	4.980752	4.938521
4.817637	4.638142	4.423680	4.193865	3.961965
3.735799	3.519450	3.314717	3.122100	2.941405
2.772087	2.613452	2.464758	2.325275	2.194313
2.071230	1.955440	1.846410	1.743655	1.646737
1.555258	1.468858	1.387207	1.310007	1.236985
1.167888	1.102487	1.040570	0.981938	0.926412
0.873820	0.824007	0.776824	0.732134	0.689809

Row 23

0.464803	0.486859	0.509604	0.533034	0.557147
0.581936	0.607396	0.633517	0.660292	0.687709
0.715759	0.744430	0.773711	0.803593	0.834066
0.865122	0.896756	0.928964	0.961749	0.995116
1.029076	1.063648	1.098856	1.134733	1.171323
1.208677	1.246858	1.285942	1.326017	1.367183
1.409556	1.453266	1.498458	1.545293	1.593949
1.644621	1.697523	1.752886	1.810963	1.872026
1.936368	2.004309	2.076189	2.152380	2.233277
2.319309	2.410934	2.508642	2.612953	2.724411
2.843576	2.970999	3.107190	3.252552	3.407270
3.571136	3.743249	3.921563	4.102206	4.278603
4.440599	4.574222	4.663226	4.693258	4.657464

4.559753	4.412900	4.233171	4.035486	3.831158
3.627741	3.429819	3.239916	3.059240	2.888199
2.726735	2.574534	2.431151	2.296085	2.168821
2.048858	1.935715	1.828945	1.728131	1.632888
1.542863	1.457730	1.377189	1.300964	1.228802
1.160468	1.095744	1.034430	0.976338	0.921295
0.869138	0.819717	0.772888	0.728518	0.686484

Row 24

0.476803	0.499432	0.522762	0.546790	0.571510
0.596914	0.622994	0.649740	0.677139	0.705179
0.733844	0.763122	0.792995	0.823452	0.854476
0.886057	0.918182	0.950844	0.984039	1.017767
1.052035	1.086854	1.122243	1.158230	1.194853
1.232159	1.270205	1.309063	1.348815	1.389559
1.431405	1.474478	1.518920	1.564888	1.612553
1.662105	1.713751	1.767714	1.824235	1.883576
1.946013	2.011846	2.081392	2.154991	2.233001
2.315802	2.403792	2.497385	2.597006	2.703078
2.816008	2.936154	3.063786	3.199004	3.341629
3.491026	3.645840	3.803623	3.960351	4.109888
4.243626	4.350730	4.419563	4.440474	4.409023
4.327737	4.205098	4.052531	3.881337	3.700861
3.517959	3.337240	3.161583	2.992651	2.831290
2.677828	2.532272	2.394436	2.264027	2.140696
2.024072	1.913782	1.809461	1.710761	1.617351
1.528923	1.445187	1.365874	1.290731	1.219527

1.152043 1.088077 1.027439 0.969954 0.915456
0.863790 0.814811 0.768384 0.724378 0.682673

Row 25

0.489043 0.512264 0.536200 0.560846 0.586195
0.612238 0.638962 0.666357 0.694405 0.723093
0.752400 0.782310 0.812802 0.843859 0.875461
0.907589 0.940228 0.973364 1.006988 1.041093
1.075679 1.110752 1.146326 1.182422 1.219072
1.256316 1.294208 1.332814 1.372211 1.412491
1.453761 1.496142 1.539770 1.584796 1.631388
1.679729 1.730018 1.782471 1.837318 1.894806
1.955198 2.018772 2.085823 2.156657 2.231596
2.310972 2.395125 2.484396 2.579117 2.679601
2.786115 2.898848 3.017862 3.143013 3.273843
3.409421 3.548119 3.687337 3.823172 3.950137
4.061090 4.147642 4.201324 4.215438 4.186993
4.117690 4.013361 3.882205 3.732813 3.572785
3.408123 3.243192 3.080967 2.923358 2.771511
2.626041 2.487210 2.355054 2.229460 2.110230
1.997116 1.889842 1.788126 1.691686 1.600245
1.513538 1.431314 1.353334 1.279370 1.209212
1.142660 1.079526 1.019634 0.962817 0.908922
0.857799 0.809312 0.763330 0.719729 0.678392

Row 26

0.501524	0.525356	0.549919	0.575205	0.601206
0.627911	0.655305	0.683374	0.712100	0.741462
0.771440	0.802011	0.833151	0.864835	0.897041
0.929744	0.962923	0.996557	1.030630	1.065129
1.100049	1.135388	1.171153	1.207358	1.244030
1.281203	1.318925	1.357255	1.396266	1.436044
1.476693	1.518326	1.561077	1.605091	1.650531
1.697573	1.746410	1.797247	1.850306	1.905820
1.964036	2.025214	2.089621	2.157537	2.229245
2.305033	2.385182	2.469966	2.559634	2.654396
2.754398	2.859682	2.970142	3.085443	3.204928
3.327474	3.451328	3.573898	3.691560	3.799527
3.891934	3.962265	4.004253	4.013121	3.986783
3.926429	3.836191	3.722070	3.590646	3.448066
3.299476	3.148859	2.999119	2.852265	2.709620
2.572002	2.439870	2.313435	2.192741	2.077720
1.968234	1.864100	1.765112	1.671050	1.581690
1.496813	1.416201	1.339646	1.266948	1.197916
1.132369	1.070135	1.011050	0.954961	0.901721
0.851191	0.803241	0.757746	0.714589	0.673656

Row 27

0.514243	0.538708	0.563919	0.589868	0.616545
0.643937	0.672028	0.700800	0.730231	0.760298
0.790977	0.822239	0.854057	0.886401	0.919241
0.952549	0.986295	1.020453	1.055000	1.089916

1.125187 1.160805 1.196771 1.233091 1.269784
1.306878 1.344415 1.382449 1.421045 1.460286
1.500269 1.541104 1.582917 1.625852 1.670063
1.715722 1.763013 1.812136 1.863299 1.916725
1.972645 2.031299 2.092932 2.157794 2.226133
2.298194 2.374207 2.454382 2.538894 2.627862
2.721326 2.819211 2.921276 3.027046 3.135729
3.246101 3.356383 3.464098 3.565966 3.657876
3.735030 3.792335 3.825076 3.829768 3.804913
3.751368 3.672138 3.571698 3.455138 3.327423
3.192914 3.055164 2.916907 2.780146 2.646290
2.516286 2.390735 2.269987 2.154211 2.043453
1.937669 1.836761 1.740592 1.649001 1.561815
1.478854 1.399939 1.324890 1.253532 1.185697
1.121222 1.059949 1.001730 0.946420 0.893885
0.843994 0.796623 0.751655 0.708977 0.668482

Row 28

0.527200 0.552317 0.578198 0.604835 0.632213
0.660320 0.689135 0.718639 0.748806 0.779610
0.811022 0.843009 0.875538 0.908575 0.942084
0.976029 1.010374 1.045086 1.080135 1.115492
1.151137 1.187053 1.223232 1.259674 1.296390
1.333402 1.370744 1.408462 1.446619 1.485289
1.524564 1.564551 1.605370 1.647159 1.690068
1.734263 1.779921 1.827234 1.876400 1.927631
1.981143 2.037158 2.095899 2.157589 2.222443

2.290666	2.362442	2.437923	2.517218	2.600371
2.687334	2.777936	2.871834	2.968459	3.066938
3.166012	3.263943	3.358428	3.446551	3.524810
3.589282	3.635955	3.661228	3.662504	3.638682
3.590395	3.519878	3.430526	3.326316	3.211269
3.089058	2.962808	2.835030	2.707654	2.582107
2.459408	2.340252	2.225093	2.114198	2.007707
1.905659	1.808027	1.714739	1.625687	1.540744
1.459772	1.382623	1.309147	1.239195	1.172619
1.109272	1.049016	0.991713	0.937231	0.885446
0.836235	0.789483	0.745077	0.702913	0.662887

Row 29

0.540391	0.566182	0.592758	0.620106	0.648212
0.677061	0.706630	0.736897	0.767833	0.799407
0.831587	0.864335	0.897613	0.931379	0.965593
1.000211	1.035191	1.070491	1.106073	1.141901
1.177944	1.214180	1.250589	1.287166	1.323911
1.360840	1.397978	1.435366	1.473059	1.511128
1.549657	1.588747	1.628517	1.669097	1.710634
1.753287	1.797228	1.842640	1.889715	1.938652
1.989653	2.042924	2.098669	2.157084	2.218356
2.282653	2.350117	2.420853	2.494910	2.572270
2.652814	2.736299	2.822310	2.910217	2.999110
3.087742	3.174461	3.257164	3.333288	3.399864
3.453677	3.491539	3.510663	3.509076	3.485953
3.441772	3.378228	3.297938	3.204041	3.099806

2.988322 2.872309 2.754040 2.635328 2.517574
2.401822 2.288823 2.179104 2.073008 1.970747
1.872431 1.778095 1.687722 1.601254 1.518606
1.439675 1.364348 1.292501 1.224009 1.158743
1.096576 1.037384 0.981043 0.927432 0.876437
0.827945 0.781847 0.738038 0.696419 0.656891

Row 30

0.553812 0.580301 0.607594 0.635679 0.664542
0.694162 0.724516 0.755578 0.787317 0.819698
0.852684 0.886231 0.920296 0.954833 0.989792
1.025123 1.060777 1.096703 1.132854 1.169185
1.205658 1.242238 1.278899 1.315625 1.352409
1.389257 1.426188 1.463234 1.500444 1.537882
1.575628 1.613778 1.652445 1.691756 1.731852
1.772888 1.815032 1.858458 1.903351 1.949900
1.998296 2.048729 2.101384 2.156437 2.214047
2.274352 2.337455 2.403420 2.472251 2.543874
2.618120 2.694690 2.773124 2.852757 2.932679
3.011684 3.088233 3.160429 3.226035 3.282539
3.327296 3.357753 3.371724 3.367685 3.345007
3.304059 3.246147 3.173319 3.088076 2.993091
2.890959 2.784039 2.674362 2.563607 2.453115
2.343921 2.236806 2.132339 2.030921 1.932820
1.838201 1.747154 1.659706 1.575845 1.495524
1.418674 1.345210 1.275035 1.208046 1.144134
1.083190 1.025103 0.969764 0.917063 0.866894

0.819154 0.773743 0.730561 0.689516 0.650514

Row 31

0.567460 0.594668 0.622704 0.651554 0.681200

0.711622 0.742795 0.774687 0.807266 0.840492

0.874322 0.908710 0.943606 0.978955 1.014704

1.050792 1.087163 1.123757 1.160517 1.197390

1.234326 1.271281 1.308220 1.345116 1.381952

1.418726 1.455448 1.492143 1.528853 1.565635

1.602563 1.639731 1.677244 1.715226 1.753816

1.793164 1.833432 1.874790 1.917416 1.961490

2.007193 2.054703 2.104187 2.155803 2.209688

2.265950 2.324665 2.385858 2.449497 2.515469

2.583563 2.653444 2.724625 2.796435 2.867980

2.938119 3.005437 3.068239 3.124580 3.172335

3.209319 3.233469 3.243051 3.236871 3.214441

3.176051 3.122723 3.056078 2.978133 2.891080

2.797108 2.698253 2.596319 2.492841 2.389080

2.286043 2.184514 2.085086 1.988197 1.894156

1.803174 1.715381 1.630849 1.549599 1.471620

1.396874 1.325302 1.256831 1.191379 1.128857

1.069171 1.012225 0.957921 0.906162 0.856851

0.809895 0.765199 0.722672 0.682226 0.643775

Row 32

0.581329	0.609280	0.638084	0.667725	0.698186
0.729442	0.761466	0.794226	0.827682	0.861794
0.896512	0.931785	0.967557	1.003767	1.040352
1.077246	1.114381	1.151689	1.189104	1.226561
1.264000	1.301366	1.338613	1.375703	1.412610
1.449321	1.485837	1.522176	1.558371	1.594474
1.630553	1.666696	1.703007	1.739605	1.776625
1.814214	1.852531	1.891742	1.932020	1.973537
2.016466	2.060973	2.107215	2.155331	2.205439
2.257625	2.311939	2.368380	2.426883	2.487307
2.549413	2.612845	2.677106	2.741530	2.805263
2.867236	2.926163	2.980537	3.028674	3.068771
3.099016	3.117727	3.123514	3.115431	3.093093
3.056730	3.007154	2.945665	2.873898	2.793669
2.706822	2.615117	2.520147	2.423303	2.325758
2.228473	2.132220	2.037598	1.945067	1.854965
1.767537	1.682947	1.601299	1.522649	1.447013
1.374380	1.304716	1.237971	1.174082	1.112976
1.054576	0.998798	0.945558	0.894770	0.846345
0.800199	0.756244	0.714397	0.674574	0.636696

Row 33

0.595412	0.624131	0.653728	0.684190	0.715495
0.747619	0.780531	0.814195	0.848570	0.883610
0.919262	0.955467	0.992165	1.029285	1.066759
1.104511	1.142463	1.180538	1.218658	1.256747
1.294734	1.332551	1.370142	1.407456	1.444456

1.481119 1.517437 1.553417 1.589087 1.624490
1.659691 1.694771 1.729832 1.764990 1.800377
1.836139 1.872432 1.909420 1.947270 1.986153
2.026232 2.067666 2.110601 2.155163 2.201454
2.249543 2.299459 2.351179 2.404618 2.459612
2.515906 2.573134 2.630800 2.688262 2.744708
2.799155 2.850436 2.897221 2.938050 2.971392
2.995737 3.009704 3.012166 3.002363 2.979991
2.945232 2.898741 2.841568 2.775055 2.700710
2.620095 2.534727 2.446013 2.355204 2.263380
2.171450 2.080157 1.990098 1.901739 1.815439
1.731464 1.650008 1.571199 1.495120 1.421814
1.351292 1.283543 1.218535 1.156224 1.096554
1.039460 0.984874 0.932722 0.882927 0.835412
0.790098 0.746907 0.705760 0.666582 0.629297

Row 34

0.609702 0.639212 0.669631 0.700942 0.733123
0.766149 0.799985 0.834595 0.869932 0.905945
0.942578 0.979767 1.017443 1.055530 1.093948
1.132615 1.171442 1.210341 1.249222 1.287997
1.326582 1.364898 1.402873 1.440446 1.477568
1.514203 1.550334 1.585958 1.621094 1.655780
1.690074 1.724055 1.757819 1.791482 1.825176
1.859043 1.893241 1.927930 1.963278 1.999450
2.036608 2.074903 2.114473 2.155434 2.197877
2.241857 2.287388 2.334432 2.382887 2.432577

2.483240	2.534508	2.585898	2.636795	2.686443
2.733938	2.778233	2.818154	2.852436	2.879776
2.898907	2.908689	2.908199	2.896822	2.874311
2.840816	2.796867	2.743323	2.681291	2.612034
2.536876	2.457128	2.374029	2.288701	2.202132
2.115171	2.028525	1.942778	1.858397	1.775748
1.695115	1.616708	1.540679	1.467132	1.396130
1.327706	1.261867	1.198600	1.137875	1.079652
1.023881	0.970503	0.919456	0.870674	0.824087
0.779625	0.737216	0.696790	0.658275	0.621600

Row 35

0.624189	0.654516	0.685783	0.717974	0.751065
0.785027	0.819827	0.855423	0.891767	0.928803
0.966468	1.004694	1.043405	1.082516	1.121941
1.161585	1.201350	1.241135	1.280839	1.320360
1.359601	1.398468	1.436876	1.474750	1.512027
1.548660	1.584618	1.619892	1.654490	1.688443
1.721805	1.754650	1.787073	1.819188	1.851127
1.883033	1.915063	1.947380	1.980150	2.013539
2.047706	2.082799	2.118951	2.156271	2.194842
2.234709	2.275876	2.318294	2.361853	2.406370
2.451582	2.497128	2.542545	2.587252	2.630547
2.671608	2.709498	2.743181	2.771563	2.793529
2.808013	2.814065	2.810924	2.798087	2.775351
2.742840	2.700988	2.650503	2.592306	2.527456
2.457085	2.382325	2.304265	2.223909	2.142156

2.059793	1.977490	1.895806	1.815202	1.736047
1.658631	1.583180	1.509862	1.438795	1.370063
1.303714	1.239773	1.178240	1.119103	1.062332
1.007891	0.955733	0.905805	0.858049	0.812406
0.768812	0.727202	0.687512	0.649675	0.613626

Row 36

0.638865	0.670033	0.702176	0.735277	0.769311
0.804248	0.840051	0.876678	0.914075	0.952183
0.990935	1.030256	1.070062	1.110262	1.150758
1.191447	1.232219	1.272960	1.313555	1.353890
1.393850	1.433328	1.472223	1.510445	1.547917
1.584578	1.620386	1.655319	1.689378	1.722586
1.754992	1.786667	1.817703	1.848216	1.878338
1.908214	1.938005	1.967875	1.997994	2.028528
2.059636	2.091467	2.124151	2.157794	2.192473
2.228228	2.265057	2.302904	2.341657	2.381133
2.421071	2.461125	2.500853	2.539715	2.577064
2.612155	2.644150	2.672139	2.695170	2.712291
2.722597	2.725293	2.719745	2.705538	2.682505
2.650747	2.610624	2.562722	2.507812	2.446790
2.380623	2.310292	2.236753	2.160904	2.083561
2.005446	1.927189	1.849323	1.772294	1.696470
1.622143	1.549546	1.478859	1.410214	1.343707
1.279403	1.217337	1.157527	1.099971	1.044652
0.991545	0.940612	0.891811	0.845093	0.800405
0.757691	0.716893	0.677952	0.640807	0.605397

Row 37

0.653716	0.685752	0.718799	0.752841	0.787852
0.823802	0.860650	0.898352	0.936852	0.976086
1.015982	1.056458	1.097425	1.138781	1.180420
1.222227	1.264080	1.305853	1.347416	1.388638
1.429389	1.469545	1.508990	1.547615	1.585329
1.622055	1.657738	1.692345	1.725867	1.758320
1.789747	1.820217	1.849822	1.878678	1.906920
1.934698	1.962176	1.989524	2.016916	2.044521
2.072504	2.101014	2.130181	2.160112	2.190882
2.222529	2.255047	2.288383	2.322420	2.356982
2.391818	2.426596	2.460904	2.494239	2.526010
2.555543	2.582092	2.604857	2.623009	2.635729
2.642249	2.641896	2.634142	2.618637	2.595245
2.564048	2.525345	2.479627	2.427540	2.369848
2.307378	2.240982	2.171502	2.099737	2.026425
1.952229	1.877735	1.803447	1.729795	1.657136
1.585763	1.515913	1.447772	1.381482	1.317151
1.254852	1.194635	1.136529	1.080541	1.026668
0.974893	0.925187	0.877518	0.831843	0.788119
0.746294	0.706318	0.668137	0.631694	0.596935

Row 38

0.668731	0.701659	0.735639	0.770654	0.806678
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0.843678	0.881615	0.920439	0.960093	1.000509
1.041609	1.083305	1.125501	1.168086	1.210944
1.253949	1.296966	1.339854	1.382467	1.424658
1.466281	1.507191	1.547255	1.586346	1.624355
1.661190	1.696780	1.731080	1.764070	1.795760
1.826187	1.855418	1.883546	1.910689	1.936986
1.962595	1.987684	2.012432	2.037019	2.061622
2.086411	2.111539	2.137142	2.163327	2.190171
2.217715	2.245953	2.274832	2.304244	2.334016
2.363911	2.393619	2.422753	2.450851	2.477375
2.501719	2.523217	2.541164	2.554840	2.563538
2.566600	2.563455	2.553658	2.536915	2.513111
2.482312	2.444770	2.400896	2.351238	2.296446
2.237231	2.174335	2.108499	2.040433	1.970804
1.900219	1.829218	1.758277	1.687806	1.618149
1.549595	1.482380	1.416695	1.352688	1.290474
1.230137	1.171736	1.115309	1.060873	1.008434
0.957984	0.909503	0.862965	0.818337	0.775581
0.734652	0.695505	0.658091	0.622360	0.588261

Row 39

0.683894	0.717740	0.752682	0.788702	0.825774
0.863865	0.902934	0.942930	0.983791	1.025446
1.067813	1.110798	1.154296	1.198188	1.242348
1.286637	1.330906	1.374999	1.418755	1.462007
1.504589	1.546338	1.587100	1.626729	1.665095
1.702089	1.737624	1.771641	1.804109	1.835031

1.864438	1.892396	1.918999	1.944370	1.968655
1.992018	2.014638	2.036704	2.058406	2.079929
2.101453	2.123138	2.145126	2.167531	2.190433
2.213877	2.237862	2.262341	2.287211	2.312311
2.337419	2.362245	2.386433	2.409559	2.431134
2.450614	2.467407	2.480892	2.490438	2.495434
2.495316	2.489594	2.477891	2.459958	2.435694
2.405158	2.368556	2.326238	2.278669	2.226404
2.170058	2.110278	2.047713	1.982999	1.916734
1.849471	1.781710	1.713895	1.646414	1.579597
1.513725	1.449033	1.385710	1.323910	1.263753
1.205329	1.148706	1.093927	1.041022	0.990001
0.940865	0.893602	0.848193	0.804611	0.762824
0.722794	0.684481	0.647841	0.612828	0.579395

Row 40

0.699191	0.733980	0.769912	0.806969	0.845125
0.884348	0.924594	0.965811	1.007935	1.050890
1.094591	1.138936	1.183814	1.229097	1.274646
1.320311	1.365929	1.411327	1.456326	1.500738
1.544379	1.587063	1.628612	1.668858	1.707652
1.744864	1.780389	1.814152	1.846112	1.876261
1.904629	1.931279	1.956308	1.979845	2.002045
2.023083	2.043150	2.062447	2.081176	2.099538
2.117722	2.135899	2.154219	2.172806	2.191748
2.211094	2.230852	2.250981	2.271389	2.291927
2.312389	2.332508	2.351958	2.370351	2.387246

2.402152 2.414545 2.423874 2.429590 2.431159
2.428095 2.419978 2.406483 2.387397 2.362635
2.332242 2.296394 2.255385 2.209613 2.159553
2.105737 2.048731 1.989106 1.927426 1.864232
1.800025 1.735266 1.670366 1.605691 1.541556
1.478233 1.415948 1.354893 1.295221 1.237055
1.180492 1.125604 1.072442 1.021040 0.971418
0.923581 0.877526 0.833239 0.790700 0.749881
0.710751 0.673274 0.637410 0.603120 0.570358

Row 41

0.714602 0.750360 0.787310 0.825436 0.864714
0.905109 0.946578 0.989067 1.032511 1.076830
1.121934 1.167715 1.214055 1.260816 1.307850
1.354991 1.402063 1.448874 1.495225 1.540910
1.585719 1.629443 1.671879 1.712835 1.752138
1.789634 1.825201 1.858746 1.890215 1.919591
1.946899 1.972204 1.995607 2.017244 2.037281
2.055907 2.073329 2.089763 2.105429 2.120541
2.135304 2.149902 2.164499 2.179228 2.194186
2.209432 2.224984 2.240810 2.256828 2.272906
2.288853 2.304427 2.319327 2.333203 2.345656
2.356247 2.364506 2.369950 2.372093 2.370471
2.364662 2.354302 2.339111 2.318906 2.293610
2.263260 2.228004 2.188092 2.143863 2.095726
2.044144 1.989609 1.932625 1.873696 1.813304
1.751907 1.689925 1.627742 1.565697 1.504091

1.443183 1.383193 1.324310 1.266685 1.210443
1.155685 1.102486 1.050903 1.000976 0.952729
0.906175 0.861314 0.818140 0.776636 0.736782
0.698550 0.661908 0.626824 0.593258 0.561171

Row 42

0.730109 0.766859 0.804856 0.844084 0.884519
0.926128 0.968867 1.012682 1.057504 1.103252
1.149831 1.197128 1.245016 1.293350 1.341969
1.390694 1.439332 1.487674 1.535500 1.582579
1.628678 1.673560 1.716995 1.758764 1.798667
1.836526 1.872195 1.905563 1.936562 1.965166
1.991396 2.015316 2.037035 2.056700 2.074489
2.090610 2.105287 2.118757 2.131258 2.143026
2.154280 2.165224 2.176035 2.186859 2.197806
2.208947 2.220308 2.231871 2.243567 2.255276
2.266829 2.278002 2.288525 2.298079 2.306304
2.312807 2.317169 2.318961 2.317756 2.313147
2.304764 2.292292 2.275487 2.254188 2.228327
2.197934 2.163131 2.124132 2.081227 2.034768
1.985157 1.932825 1.878216 1.821778 1.763944
1.705128 1.645717 1.586061 1.526479 1.467254
1.408632 1.350826 1.294018 1.238358 1.183973
1.130962 1.079404 1.029361 0.980876 0.933979
0.888686 0.845004 0.802929 0.762453 0.723557
0.686218 0.650411 0.616104 0.583264 0.551854

Row 43

0.745691	0.783458	0.822528	0.862889	0.904518
0.947383	0.991439	1.036632	1.082893	1.130138
1.178266	1.227162	1.276691	1.326698	1.377009
1.427434	1.477760	1.527762	1.577194	1.625803
1.673325	1.719497	1.764057	1.806757	1.847364
1.885673	1.921513	1.954754	1.985309	2.013144
2.038274	2.060768	2.080741	2.098354	2.113802
2.127314	2.139137	2.149530	2.158758	2.167075
2.174726	2.181932	2.188887	2.195754	2.202658
2.209681	2.216863	2.224197	2.231628	2.239052
2.246318	2.253224	2.259524	2.264931	2.269120
2.271737	2.272410	2.270757	2.266399	2.258978
2.248170	2.233698	2.215348	2.192978	2.166526
2.136014	2.101545	2.063299	2.021526	1.976530
1.928659	1.878291	1.825818	1.771637	1.716137
1.659694	1.602657	1.545353	1.488075	1.431089
1.374629	1.318897	1.264069	1.210294	1.157694
1.106371	1.056405	1.007860	0.960783	0.915207
0.871152	0.828630	0.787641	0.748180	0.710234
0.673783	0.638806	0.605274	0.573158	0.542425

Row 44

0.761325	0.800130	0.840301	0.881827	0.924685
0.968847	1.014268	1.060894	1.108655	1.157465

1.207222	1.257803	1.309068	1.360852	1.412972
1.465220	1.517367	1.569167	1.620351	1.670637
1.719733	1.767342	1.813169	1.856929	1.898358
1.937219	1.973311	2.006480	2.036622	2.063692
2.087702	2.108723	2.126881	2.142353	2.155356
2.166144	2.174991	2.182184	2.188016	2.192768
2.196709	2.200084	2.203107	2.205959	2.208779
2.211665	2.214672	2.217804	2.221021	2.224236
2.227311	2.230069	2.232286	2.233703	2.234027
2.232940	2.230107	2.225189	2.217849	2.207771
2.194666	2.178291	2.158455	2.135033	2.107967
2.077272	2.043032	2.005402	1.964593	1.920870
1.874535	1.825918	1.775366	1.723231	1.669862
1.615597	1.560757	1.505637	1.450513	1.395632
1.341212	1.287448	1.234508	1.182536	1.131652
1.081956	1.033531	0.986441	0.940735	0.896449
0.853608	0.812225	0.772306	0.733847	0.696840
0.661269	0.627115	0.594355	0.562961	0.532903

Row 45

0.776985	0.816851	0.858149	0.900868	0.944992
0.990491	1.037324	1.085438	1.134761	1.185208
1.236673	1.289030	1.342131	1.395805	1.449854
1.504057	1.558169	1.611917	1.665012	1.717139
1.767973	1.817183	1.864434	1.909405	1.951790
1.991316	2.027752	2.060915	2.090681	2.116993
2.139859	2.159354	2.175620	2.188851	2.199294

2.207228	2.212963	2.216819	2.219119	2.220178
2.220293	2.219734	2.218738	2.217506	2.216196
2.214921	2.213749	2.212700	2.211746	2.210816
2.209789	2.208505	2.206765	2.204333	2.200944
2.196313	2.190138	2.182116	2.171944	2.159342
2.144052	2.125858	2.104590	2.080133	2.052433
2.021497	1.987397	1.950261	1.910271	1.867654
1.822673	1.775618	1.726794	1.676515	1.625091
1.572827	1.520015	1.466927	1.413815	1.360909
1.308415	1.256516	1.205372	1.155123	1.105885
1.057758	1.010821	0.965141	0.920769	0.877742
0.836087	0.795821	0.756952	0.719480	0.683400
0.648700	0.615363	0.583368	0.552691	0.523306

Row 46

0.792645	0.833592	0.876040	0.919984	0.965407
1.012284	1.060576	1.110231	1.161180	1.213336
1.266591	1.320817	1.375859	1.431538	1.487646
1.543947	1.600175	1.656037	1.711215	1.765362
1.818119	1.869112	1.917966	1.964314	2.007807
2.048131	2.085015	2.118247	2.147679	2.173241
2.194936	2.212849	2.227134	2.238013	2.245761
2.250698	2.253167	2.253531	2.252149	2.249373
2.245531	2.240923	2.235813	2.230421	2.224926
2.219457	2.214096	2.208878	2.203789	2.198770
2.193719	2.188491	2.182906	2.176751	2.169787
2.161755	2.152384	2.141398	2.128528	2.113520

2.096145	2.076206	2.053551	2.028074	1.999723
1.968499	1.934459	1.897711	1.858411	1.816754
1.772968	1.727306	1.680037	1.631439	1.581791
1.531366	1.480428	1.429227	1.377994	1.326941
1.276262	1.226129	1.176694	1.128090	1.080430
1.033809	0.988309	0.943995	0.900917	0.859115
0.818618	0.779446	0.741607	0.705107	0.669940
0.636099	0.603569	0.572332	0.542368	0.513651

Row 47

0.808277	0.850323	0.893945	0.939139	0.985894
1.034188	1.083986	1.135237	1.187874	1.241812
1.296942	1.353132	1.410224	1.468031	1.526334
1.584883	1.643392	1.701546	1.758995	1.815361
1.870243	1.923224	1.973880	2.021794	2.066568
2.107839	2.145292	2.178680	2.207828	2.232649
2.253144	2.269406	2.281610	2.290008	2.294914
2.296687	2.295720	2.292417	2.287185	2.280414
2.272470	2.263687	2.254353	2.244717	2.234973
2.225270	2.215704	2.206323	2.197126	2.188068
2.179060	2.169974	2.160646	2.150883	2.140467
2.129164	2.116725	2.102903	2.087452	2.070144
2.050770	2.029153	2.005151	1.978669	1.949652
1.918098	1.884051	1.847600	1.808877	1.768049
1.725315	1.680895	1.635025	1.587953	1.539927
1.491191	1.441985	1.392537	1.343057	1.293743
1.244775	1.196313	1.148501	1.101465	1.055315

1.010143 0.966027 0.923031 0.881209 0.840598
0.801231 0.763126 0.726297 0.690749 0.656481
0.623486 0.591754 0.561267 0.532009 0.503955

Row 48

0.823849 0.867012 0.911827 0.958298 1.006416
1.056165 1.107513 1.160413 1.214802 1.270594
1.327683 1.385936 1.445191 1.505253 1.565895
1.626851 1.687819 1.748456 1.808383 1.867184
1.924416 1.979613 2.032296 2.081991 2.128243
2.170632 2.208794 2.242437 2.271357 2.295449
2.314710 2.329244 2.339252 2.345021 2.346912
2.345335 2.340734 2.333570 2.324297 2.313354
2.301148 2.288047 2.274372 2.260393 2.246329
2.232344 2.218549 2.205004 2.191722 2.178667
2.165763 2.152896 2.139916 2.126648 2.112893
2.098433 2.083045 2.066499 2.048574 2.029059
2.007765 1.984528 1.959218 1.931743 1.902051
1.870131 1.836017 1.799782 1.761537 1.721424
1.679615 1.636302 1.591693 1.546006 1.499460
1.452277 1.404672 1.356851 1.309009 1.261325
1.213967 1.167085 1.120814 1.075273 1.030567
0.986784 0.944000 0.902279 0.861671 0.822218
0.783949 0.746886 0.711045 0.676430 0.643045
0.610883 0.579936 0.550191 0.521630 0.494234

Row 49

0.839329	0.883623	0.929651	0.977421	1.026932
1.078171	1.131112	1.185712	1.241914	1.299634
1.358768	1.419184	1.480716	1.543166	1.606298
1.669832	1.733446	1.796773	1.859402	1.920878
1.980710	2.038376	2.093339	2.145059	2.193013
2.236717	2.275748	2.309763	2.338521	2.361895
2.379881	2.392597	2.400275	2.403246	2.401924
2.396781	2.388326	2.377078	2.363552	2.348239
2.331591	2.314016	2.295866	2.277440	2.258975
2.240653	2.222599	2.204884	2.187531	2.170514
2.153769	2.137190	2.120643	2.103964	2.086969
2.069460	2.051227	2.032061	2.011757	1.990120
1.966977	1.942174	1.915590	1.887136	1.856759
1.824443	1.790212	1.754123	1.716269	1.676770
1.635774	1.593448	1.549974	1.505542	1.460351
1.414595	1.368469	1.322161	1.275846	1.229691
1.183849	1.138461	1.093652	1.049535	1.006208
0.963757	0.922254	0.881762	0.842329	0.803997
0.766796	0.730750	0.695872	0.662172	0.629651
0.598308	0.568135	0.539120	0.511248	0.484501

Row 50

0.854683	0.900119	0.947376	0.996467	1.047396
1.100158	1.154732	1.211083	1.269157	1.328877
1.390142	1.452821	1.516749	1.581724	1.647502

1.713792 1.780254 1.846495 1.912069 1.976482
2.039190 2.099611 2.157140 2.211161 2.261075
2.306321 2.346405 2.380925 2.409597 2.432269
2.448933 2.459725 2.464915 2.464889 2.460127
2.451173 2.438609 2.423027 2.405009 2.385103
2.363815 2.341593 2.318824 2.295832 2.272878
2.250157 2.227807 2.205910 2.184497 2.163549
2.143010 2.122784 2.102745 2.082741 2.062600
2.042137 2.021157 1.999464 1.976868 1.953188
1.928260 1.901941 1.874115 1.844696 1.813628
1.780892 1.746500 1.710496 1.672957 1.633983
1.593701 1.552254 1.509801 1.466511 1.422556
1.378114 1.333356 1.288453 1.243564 1.198842
1.154428 1.110451 1.067028 1.024266 0.982256
0.941081 0.900809 0.861501 0.823204 0.785958
0.749795 0.714736 0.680799 0.647992 0.616319
0.585779 0.556366 0.528069 0.500877 0.474772

Row 51

0.869874 0.916462 0.964960 1.015389 1.067760
1.122074 1.178319 1.236468 1.296472 1.358262
1.421742 1.486785 1.553229 1.620869 1.689456
1.758690 1.828212 1.897606 1.966392 2.034029
2.099920 2.163415 2.223832 2.280470 2.332639
2.379689 2.421041 2.456223 2.484896 2.506881
2.522165 2.530909 2.533428 2.530174 2.521707
2.508658 2.491695 2.471496 2.448716 2.423971

2.397823	2.370763	2.343216	2.315532	2.287990
2.260803	2.234116	2.208021	2.182553	2.157701
2.133412	2.109597	2.086137	2.062887	2.039687
2.016359	1.992721	1.968588	1.943781	1.918129
1.891476	1.863688	1.834651	1.804281	1.772521
1.739344	1.704753	1.668782	1.631491	1.592963
1.553306	1.512643	1.471110	1.428857	1.386035
1.342800	1.299309	1.255711	1.212154	1.168776
1.125705	1.083061	1.040953	0.999480	0.958727
0.918773	0.879684	0.841515	0.804314	0.768120
0.732962	0.698865	0.665844	0.633909	0.603065
0.573312	0.544645	0.517056	0.490532	0.465060

Row 52

0.884864	0.932610	0.982359	1.034139	1.087971
1.143864	1.201815	1.261803	1.323792	1.387719
1.453496	1.521004	1.590083	1.660531	1.732096
1.804469	1.877278	1.950081	2.022365	2.093542
2.162955	2.229882	2.293552	2.353167	2.407932
2.457090	2.499961	2.535986	2.564765	2.586079
2.599915	2.606461	2.606091	2.599339	2.586859
2.569386	2.547694	2.522554	2.494710	2.464852
2.433600	2.401496	2.368998	2.336484	2.304251
2.272523	2.241456	2.211143	2.181624	2.152890
2.124892	2.097542	2.070727	2.044308	2.018128
1.992020	1.965807	1.939316	1.912372	1.884815
1.856495	1.827281	1.797064	1.765759	1.733305

1.699671	1.664851	1.628868	1.591767	1.553617
1.514506	1.474541	1.433839	1.392527	1.350742
1.308621	1.266300	1.223918	1.181605	1.139486
1.097680	1.056296	1.015434	0.975186	0.935634
0.896848	0.858892	0.821820	0.785677	0.750499
0.716317	0.683153	0.651023	0.619939	0.589905
0.560922	0.532987	0.506092	0.480227	0.455378

Row 53

0.899613	0.948519	0.999525	1.052667	1.107975
1.165468	1.225153	1.287021	1.351044	1.417171
1.485325	1.555394	1.627228	1.700628	1.775343
1.851059	1.927391	2.003877	2.079968	2.155031
2.228343	2.299102	2.366439	2.429445	2.487200
2.538819	2.583503	2.620587	2.649591	2.670254
2.682558	2.686728	2.683210	2.672639	2.655786
2.633511	2.606708	2.576262	2.543016	2.507739
2.471118	2.433743	2.396109	2.358618	2.321583
2.285238	2.249741	2.215189	2.181621	2.149028
2.117359	2.086528	2.056422	2.026904	1.997822
1.969012	1.940305	1.911531	1.882523	1.853124
1.823191	1.792594	1.761227	1.729002	1.695858
1.661755	1.626681	1.590647	1.553686	1.515853
1.477221	1.437877	1.397923	1.357470	1.316635
1.275539	1.234304	1.193052	1.151902	1.110965
1.070350	1.030156	0.990476	0.951393	0.912985
0.875317	0.838449	0.802431	0.767307	0.733111

0.699873 0.667615 0.636352 0.606096 0.576853
0.548623 0.521405 0.495191 0.469973 0.445737

Row 54

0.914081 0.964145 1.016408 1.070918 1.127713
1.186823 1.248266 1.312046 1.378147 1.446534
1.517139 1.589864 1.664569 1.741064 1.819103
1.898371 1.978475 2.058932 2.139164 2.218489
2.296116 2.371157 2.442633 2.509504 2.570706
2.625203 2.672046 2.710443 2.739814 2.759846
2.770517 2.772096 2.765121 2.750352 2.728703
2.701184 2.668834 2.632668 2.593638 2.552605
2.510324 2.467434 2.424467 2.381844 2.339892
2.298849 2.258875 2.220063 2.182448 2.146018
2.110717 2.076456 2.043121 2.010574 1.978665
1.947230 1.916104 1.885120 1.854116 1.822938
1.791443 1.759506 1.727019 1.693893 1.660063
1.625484 1.590136 1.554019 1.517156 1.479587
1.441371 1.402582 1.363305 1.323633 1.283670
1.243520 1.203292 1.163093 1.123029 1.083202
1.043708 1.004639 0.966079 0.928105 0.890787
0.854188 0.818363 0.783358 0.749216 0.715969
0.683645 0.652265 0.621845 0.592395 0.563923
0.536429 0.509912 0.484366 0.459782 0.436149

Row 55

0.928223	0.979440	1.032958	1.088836	1.147122
1.207859	1.271079	1.336798	1.405017	1.475713
1.548837	1.624307	1.701995	1.781727	1.863265
1.946298	2.030430	2.115164	2.199894	2.283890
2.366293	2.446120	2.522269	2.593553	2.658736
2.716599	2.766015	2.806027	2.835936	2.855360
2.864270	2.862997	2.852194	2.832774	2.805831
2.772554	2.734155	2.691798	2.646561	2.599400
2.551142	2.502478	2.453968	2.406053	2.359066
2.313245	2.268746	2.225654	2.183997	2.143753
2.104860	2.067222	2.030720	1.995214	1.960550
1.926566	1.893095	1.859974	1.827040	1.794141
1.761137	1.727902	1.694326	1.660319	1.625811
1.590752	1.555113	1.518887	1.482085	1.444735
1.406884	1.368589	1.329923	1.290965	1.251802
1.212527	1.173233	1.134016	1.094969	1.056184
1.017748	0.979742	0.942244	0.905324	0.869046
0.833469	0.798643	0.764612	0.731415	0.699084
0.667643	0.637114	0.607513	0.578848	0.551127
0.524351	0.498520	0.473627	0.449665	0.426624

Row 56

0.941997	0.994355	1.049121	1.106361	1.166137
1.228506	1.293513	1.361191	1.431557	1.504607
1.580311	1.658606	1.739384	1.822488	1.907697
1.994710	2.083133	2.172464	2.262071	2.351181

2.438868	2.524045	2.605477	2.681806	2.751596
2.813406	2.865887	2.907881	2.938532	2.957371
2.964365	2.959921	2.944838	2.920226	2.887398
2.847765	2.802739	2.753660	2.701741	2.648045
2.593470	2.538754	2.484484	2.431113	2.378974
2.328297	2.279229	2.231843	2.186151	2.142121
2.099678	2.058719	2.019113	1.980717	1.943372
1.906912	1.871171	1.835982	1.801184	1.766624
1.732162	1.697671	1.663038	1.628172	1.592996
1.557457	1.521517	1.485161	1.448390	1.411220
1.373686	1.335834	1.297722	1.259416	1.220990
1.182524	1.144099	1.105798	1.067704	1.029898
0.992459	0.955459	0.918968	0.883050	0.847765
0.813164	0.779296	0.746201	0.713914	0.682465
0.651879	0.622175	0.593367	0.565465	0.538475
0.512400	0.487238	0.462984	0.439632	0.417171

Row 57

0.955357	1.008841	1.064840	1.123431	1.184691
1.248689	1.315486	1.385133	1.457667	1.533106
1.611440	1.692631	1.776595	1.863201	1.952246
2.043451	2.136433	2.230690	2.325576	2.420279
2.513806	2.604965	2.692374	2.774482	2.849614
2.916065	2.972206	3.016624	3.048265	3.066547
3.071431	3.063422	3.043509	3.013051	2.973638
2.926947	2.874631	2.818227	2.759102	2.698427
2.637171	2.576114	2.515862	2.456870	2.399463

2.343859	2.290184	2.238494	2.188783	2.140999
2.095055	2.050831	2.008189	1.966974	1.927022
1.888163	1.850224	1.813038	1.776442	1.740281
1.704412	1.668707	1.633052	1.597349	1.561520
1.525504	1.489257	1.452754	1.415988	1.378966
1.341710	1.304254	1.266645	1.228936	1.191190
1.153474	1.115857	1.078413	1.041212	1.004328
0.967829	0.931781	0.896246	0.861283	0.826943
0.793277	0.760327	0.728130	0.696719	0.666122
0.636361	0.607455	0.579417	0.552256	0.525978
0.500585	0.476076	0.452448	0.429692	0.407800

Row 58

0.968257	1.022847	1.080059	1.139985	1.202713
1.268328	1.336909	1.408528	1.483241	1.561090
1.642093	1.726239	1.813475	1.903697	1.996738
2.092341	2.190148	2.289668	2.390251	2.491058
2.591033	2.688880	2.783057	2.871795	2.953141
3.025065	3.085589	3.132978	3.165914	3.183670
3.186196	3.174131	3.148712	3.111617	3.064781
3.010211	2.949843	2.885437	2.818527	2.750393
2.682072	2.614375	2.547917	2.483144	2.420363
2.359766	2.301457	2.245463	2.191754	2.140258
2.090865	2.043442	1.997834	1.953876	1.911394
1.870211	1.830150	1.791039	1.752710	1.715007
1.677784	1.640910	1.604267	1.567755	1.531288
1.494802	1.458244	1.421584	1.384804	1.347901

1.310888	1.273789	1.236638	1.199479	1.162361
1.125341	1.088479	1.051836	1.015474	0.979458
0.943848	0.908701	0.874074	0.840018	0.806582
0.773809	0.741738	0.710404	0.679836	0.650060
0.621097	0.592963	0.565671	0.539229	0.513644
0.488916	0.465044	0.442026	0.419853	0.398518

Row 59

0.980650	1.036320	1.094721	1.155956	1.220129
1.287342	1.357693	1.431272	1.508163	1.588433
1.672130	1.759274	1.849850	1.943792	2.040970
2.141167	2.244059	2.349181	2.455894	2.563345
2.670427	2.775745	2.877591	2.973949	3.062544
3.140947	3.206746	3.257780	3.292393	3.309656
3.309512	3.292774	3.261009	3.216311	3.161051
3.097638	3.028342	2.955176	2.879847	2.803743
2.727957	2.653318	2.580434	2.509728	2.441477
2.375838	2.312878	2.252593	2.194921	2.139762
2.086983	2.036429	1.987932	1.941310	1.896379
1.852952	1.810845	1.769881	1.729887	1.690703
1.652181	1.614183	1.576590	1.539295	1.502211
1.465264	1.428397	1.391572	1.354762	1.317957
1.281159	1.244382	1.207650	1.170996	1.134461
1.098090	1.061932	1.026040	0.990469	0.955271
0.920500	0.886208	0.852444	0.819253	0.786678
0.754759	0.723531	0.693026	0.663269	0.634285
0.606092	0.578705	0.552136	0.526393	0.501480

0.477399 0.454149 0.431726 0.410123 0.389333

Row 60

0.992491 1.049209 1.108766 1.171279 1.236866

1.305648 1.377742 1.453261 1.532315 1.615000

1.701399 1.791568 1.885534 1.983277 2.084716

2.189685 2.297909 2.408965 2.522246 2.636906

2.751805 2.865459 2.975993 3.081125 3.178202

3.264312 3.336490 3.392021 3.428791 3.445603

3.442383 3.420189 3.381026 3.327537 3.262648

3.189263 3.110038 3.027266 2.942832 2.858220

2.774560 2.692681 2.613163 2.536389 2.462589

2.391874 2.324265 2.259715 2.198127 2.139367

2.083274 2.029670 1.978365 1.929164 1.881868

1.836280 1.792207 1.749465 1.707875 1.667274

1.627506 1.588433 1.549928 1.511882 1.474202

1.436807 1.399637 1.362643 1.325793 1.289067

1.252460 1.215976 1.179629 1.143444 1.107450

1.071684 1.036187 1.001001 0.966173 0.931748

0.897773 0.864291 0.831347 0.798980 0.767228

0.736127 0.705708 0.675998 0.647022 0.618801

0.591351 0.564687 0.538818 0.513752 0.489493

0.466042 0.443397 0.421555 0.400510 0.380252

Row 61

1.003732	1.061461	1.122135	1.185886	1.252849
1.323160	1.396959	1.474384	1.555572	1.640651
1.729740	1.822939	1.920323	2.021925	2.127723
2.237616	2.351395	2.468703	2.588987	2.711433
2.834901	2.957839	3.078214	3.193461	3.300496
3.395820	3.475763	3.536877	3.576422	3.592830
3.586007	3.557345	3.509455	3.445705	3.369737
3.285053	3.194761	3.101451	3.007178	2.913501
2.821562	2.732158	2.645818	2.562863	2.483460
2.407658	2.335422	2.266653	2.201212	2.138926
2.079602	2.023036	1.969015	1.917326	1.867754
1.820092	1.774136	1.729693	1.686580	1.644625
1.603670	1.563570	1.524196	1.485432	1.447179
1.409354	1.371888	1.334726	1.297829	1.261170
1.224734	1.188518	1.152527	1.116777	1.081289
1.046090	1.011212	0.976691	0.942564	0.908871
0.875650	0.842939	0.810775	0.779194	0.748229
0.717910	0.688266	0.659321	0.631096	0.603610
0.576879	0.550913	0.525723	0.501314	0.477690
0.454851	0.432796	0.411520	0.391018	0.371281

Row 62

1.014327	1.073024	1.134770	1.199712	1.268001
1.339792	1.415247	1.494530	1.577805	1.665237
1.756985	1.853196	1.953998	2.059486	2.169710
2.284647	2.404173	2.528020	2.655722	2.786535
2.919353	3.052598	3.184105	3.311024	3.429787

3.536188 3.625655 3.693759 3.736890 3.752953
3.741824 3.705374 3.647054 3.571214 3.482411
3.384880 3.282236 3.177374 3.072492 2.969191
2.868581 2.771393 2.678074 2.588859 2.503828
2.422956 2.346139 2.273220 2.204007 2.138286
2.075829 2.016400 1.959763 1.905683 1.853932
1.804287 1.756534 1.710471 1.665909 1.622668
1.580585 1.539511 1.499310 1.459863 1.421066
1.382830 1.345079 1.307753 1.270806 1.234204
1.197925 1.161956 1.126297 1.090953 1.055938
1.021272 0.986978 0.953085 0.919621 0.886621
0.854115 0.822137 0.790717 0.759887 0.729673
0.700105 0.671204 0.642994 0.615492 0.588716
0.562678 0.537388 0.512855 0.489083 0.466075
0.443831 0.422349 0.401626 0.381654 0.362426

Row 63

1.024232 1.083846 1.146612 1.212690 1.282246
1.355457 1.432506 1.513582 1.598883 1.688608
1.782960 1.882137 1.986326 2.095693 2.210369
2.330425 2.455845 2.586477 2.721976 2.861715
3.004679 3.149317 3.293384 3.433771 3.566386
3.686182 3.787435 3.864381 3.912181 3.927973
3.911588 3.865596 3.794643 3.704418 3.600661
3.488482 3.372053 3.254552 3.138277 3.024807
2.915169 2.809982 2.709571 2.614055 2.523412
2.437521 2.356198 2.279221 2.206340 2.137293

2.071812	2.009632	1.950488	1.894125	1.840296
1.788765	1.739306	1.691708	1.645773	1.601316
1.558168	1.516173	1.475192	1.435100	1.395789
1.357163	1.319142	1.281660	1.244664	1.208113
1.171979	1.136242	1.100893	1.065931	1.031362
0.997198	0.963456	0.930156	0.897322	0.864979
0.833154	0.801874	0.771164	0.741050	0.711556
0.682706	0.654520	0.627016	0.600211	0.574118
0.548749	0.524113	0.500216	0.477061	0.454652
0.432986	0.412063	0.391877	0.372422	0.353691

Row 64

1.033402	1.093878	1.157604	1.224754	1.295511
1.370070	1.448636	1.531428	1.618673	1.710610
1.807485	1.909552	2.017062	2.130260	2.249368
2.374567	2.505969	2.643570	2.787186	2.936364
3.090248	3.247401	3.405583	3.561486	3.710495
3.846589	3.962571	4.050848	4.104802	4.120417
4.097462	4.039554	3.953080	3.845577	3.724307
3.595410	3.463624	3.332355	3.203914	3.079776
2.960811	2.847468	2.739909	2.638107	2.541910
2.451090	2.365372	2.284457	2.208034	2.135789
2.067413	2.002605	1.941075	1.882543	1.826745
1.773430	1.722360	1.673315	1.626088	1.580487
1.536338	1.493479	1.451766	1.411070	1.371277
1.332286	1.294013	1.256385	1.219343	1.182842
1.146845	1.111326	1.076271	1.041670	1.007523

0.973835	0.940615	0.907879	0.875642	0.843925
0.812749	0.782134	0.752102	0.722674	0.693870
0.665710	0.638209	0.611385	0.585251	0.559817
0.535095	0.511090	0.487809	0.465253	0.443424
0.422321	0.401941	0.382279	0.363328	0.345081

Row 65

1.041795	1.103071	1.167691	1.235841	1.307721
1.383545	1.463541	1.547953	1.637043	1.731086
1.830378	1.935227	2.045955	2.162889	2.286354
2.416655	2.554054	2.698724	2.850692	3.009739
3.175259	3.346040	3.519981	3.693703	3.862129
4.018162	4.152752	4.255776	4.317972	4.333541
4.302148	4.229044	4.123213	3.994772	3.852923
3.704961	3.556141	3.409975	3.268651	3.133424
3.004918	2.883345	2.768656	2.660644	2.559008
2.463394	2.373428	2.288726	2.208912	2.133618
2.062490	1.995193	1.931406	1.870830	1.813179
1.758188	1.705608	1.655207	1.606771	1.560102
1.515019	1.471355	1.428961	1.387704	1.347463
1.308135	1.269629	1.231869	1.194789	1.158338
1.122474	1.087165	1.052390	1.018132	0.984387
0.951151	0.918429	0.886229	0.854562	0.823441
0.792884	0.762905	0.733522	0.704751	0.676608
0.649109	0.622268	0.596098	0.570610	0.545813
0.521715	0.498321	0.475636	0.453661	0.432395
0.411838	0.391986	0.372834	0.354374	0.336600

Row 66

1.049370	1.111379	1.176819	1.245890	1.318806
1.395801	1.477124	1.563047	1.653861	1.749884
1.851457	1.958946	2.072746	2.193271	2.320957
2.456245	2.599565	2.751302	2.911737	3.080959
3.258712	3.444160	3.635528	3.829585	4.020975
4.201515	4.359889	4.482453	4.555927	4.571634
4.529071	4.436129	4.305780	4.151769	3.985709
3.816092	3.648522	3.486397	3.331588	3.184977
3.046834	2.917061	2.795350	2.681280	2.574379
2.474157	2.380129	2.291826	2.208799	2.130625
2.056906	1.987271	1.921372	1.858883	1.799502
1.742950	1.688964	1.637303	1.587746	1.540087
1.494139	1.449732	1.406710	1.364935	1.324285
1.284650	1.245934	1.208057	1.170949	1.134553
1.098820	1.063715	1.029208	0.995281	0.961919
0.929115	0.896869	0.865181	0.834058	0.803508
0.773542	0.744172	0.715410	0.687269	0.659761
0.632898	0.606691	0.581151	0.556286	0.532103
0.508609	0.485806	0.463698	0.442286	0.421567
0.401541	0.382202	0.363545	0.345565	0.328251

Row 67

1.056090	1.118759	1.184939	1.254843	1.328700
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1.406760	1.489295	1.576601	1.669002	1.766853
1.870542	1.980494	2.097176	2.221093	2.352795
2.492871	2.641935	2.800608	2.969474	3.148999
3.339393	3.540372	3.750746	3.967773	4.186183
4.396918	4.586046	4.735060	4.824395	4.840515
4.782625	4.663102	4.501216	4.315807	4.121338
3.927326	3.739363	3.560383	3.391674	3.233563
3.085843	2.948029	2.819507	2.699614	2.587691
2.483101	2.385242	2.293555	2.207521	2.126660
2.050530	1.978723	1.910863	1.846604	1.785624
1.727630	1.672348	1.619527	1.568939	1.520371
1.473630	1.428542	1.384948	1.342704	1.301683
1.261772	1.222873	1.184898	1.147773	1.111438
1.075838	1.040933	1.006688	0.973079	0.940087
0.907698	0.875907	0.844710	0.814108	0.784105
0.754707	0.725921	0.697755	0.670219	0.643320
0.617069	0.591473	0.566540	0.542276	0.518687
0.495775	0.473545	0.451996	0.431128	0.410941
0.391429	0.372590	0.354416	0.336902	0.320038

Row 68

1.061920	1.125171	1.192005	1.262646	1.337339
1.416348	1.499967	1.588515	1.682345	1.781850
1.887461	1.999663	2.118991	2.246044	2.381487
2.526059	2.680571	2.845902	3.022972	3.212695
3.415865	3.632940	3.863637	4.106191	4.356062
4.603938	4.833252	5.018945	5.131380	5.148350

5.068518	4.912328	4.709294	4.485280	4.257743
4.036640	3.826891	3.630460	3.447716	3.278223
3.121176	2.975633	2.840631	2.715246	2.598616
2.489953	2.388539	2.293722	2.204914	2.121579
2.043234	1.969435	1.899779	1.833900	1.771459
1.712148	1.655683	1.601807	1.550280	1.500887
1.453428	1.407725	1.363615	1.320951	1.279601
1.239449	1.200392	1.162340	1.125214	1.088948
1.053486	1.018780	0.984793	0.951494	0.918859
0.886871	0.855519	0.824794	0.794693	0.765215
0.736361	0.708137	0.680544	0.653589	0.627278
0.601615	0.576608	0.552261	0.528577	0.505560
0.483213	0.461536	0.440529	0.420190	0.400517
0.381506	0.363152	0.345448	0.328388	0.311962

Row 69

1.066828	1.130577	1.197974	1.269251	1.344666
1.424500	1.509061	1.598693	1.693777	1.794738
1.902052	2.016253	2.137949	2.267823	2.406657
2.555337	2.714876	2.886417	3.071247	3.270775
3.486481	3.719762	3.971599	4.241823	4.527639
4.820795	5.102980	5.340920	5.488534	5.507100
5.394188	5.185778	4.928474	4.657270	4.391881
4.141374	3.908946	3.694930	3.498396	3.317937
3.152041	2.999251	2.858230	2.727779	2.606833
2.494451	2.389800	2.292142	2.200820	2.115248
2.034899	1.959301	1.888025	1.820684	1.756925

1.696428	1.638900	1.584074	1.531705	1.481572
1.433473	1.387222	1.342655	1.299621	1.257986
1.217629	1.178444	1.140337	1.103227	1.067043
1.031724	0.997220	0.963487	0.930491	0.898205
0.866606	0.835678	0.805409	0.775791	0.746818
0.718490	0.690805	0.663764	0.637370	0.611624
0.586529	0.562090	0.538307	0.515184	0.492721
0.470920	0.449778	0.429296	0.409470	0.390297
0.371773	0.353890	0.336643	0.320025	0.304026

Row 70

1.070786	1.134946	1.202808	1.274614	1.350631
1.431153	1.516506	1.607052	1.703197	1.805396
1.914163	2.030083	2.153822	2.286148	2.427947
2.580251	2.744261	2.921388	3.113287	3.321891
3.549432	3.798404	4.071388	4.370520	4.696105
5.043303	5.394920	5.709342	5.913712	5.935274
5.769146	5.483858	5.154790	4.826945	4.519504
4.238187	3.983011	3.751921	3.542319	3.351658
3.177642	3.018271	2.871826	2.736836	2.612039
2.496348	2.388824	2.288646	2.195096	2.107541
2.025417	1.948224	1.875512	1.806876	1.741950
1.680403	1.621933	1.566267	1.513155	1.462370
1.413708	1.366979	1.322016	1.278665	1.236789
1.196265	1.156983	1.118846	1.081770	1.045681
1.010514	0.976215	0.942737	0.910041	0.878096
0.846876	0.816360	0.786533	0.757381	0.728897

0.701075 0.673912 0.647403 0.621549 0.596349
0.571803 0.547911 0.524675 0.502093 0.480166
0.458893 0.438271 0.418297 0.398969 0.380281
0.362228 0.344804 0.328003 0.311815 0.296231

Row 71

1.073770 1.138250 1.206475 1.278696 1.355187
1.436255 1.522239 1.613517 1.710516 1.813715
1.923664 2.040987 2.166407 2.300762 2.445032
2.600378 2.768176 2.950084 3.148105 3.364687
3.602825 3.866187 4.159193 4.486904 4.854257
5.263261 5.704249 6.133088 6.436106 6.463636
6.204468 5.802639 5.380098 4.986915 4.635037
4.323112 4.046298 3.799462 3.578074 3.378357
3.197215 3.032115 2.880975 2.742070 2.613958
2.495423 2.385427 2.283081 2.187612 2.098347
2.014691 1.936119 1.862164 1.792405 1.726467
1.664008 1.604722 1.548328 1.494573 1.443228
1.394082 1.346946 1.301649 1.258035 1.215964
1.175311 1.135965 1.097825 1.060804 1.024825
0.989820 0.955732 0.922510 0.890113 0.858505
0.827656 0.797542 0.768143 0.739445 0.711434
0.684103 0.657443 0.631449 0.606117 0.581444
0.557427 0.534066 0.511357 0.489300 0.467892
0.447129 0.427010 0.407530 0.388684 0.370467
0.352873 0.335895 0.319526 0.303757 0.288578

Row 72

1.075760	1.140466	1.208949	1.281466	1.358300
1.439764	1.526209	1.618025	1.715657	1.819604
1.930441	2.048827	2.175529	2.311443	2.457628
2.615349	2.786131	2.971842	3.174790	3.397879
3.644808	3.920372	4.230855	4.584554	4.992226
5.466538	6.016119	6.615961	7.107476	7.148514
6.708127	6.127941	5.589858	5.126857	4.731742
4.391788	4.095939	3.835619	3.604321	3.397083
3.210069	3.040270	2.885287	2.743180	2.612353
2.491482	2.379453	2.275316	2.178257	2.087569
2.002634	1.922909	1.847909	1.777207	1.710415
1.647188	1.587213	1.530207	1.475912	1.424096
1.374549	1.327077	1.281509	1.237687	1.195469
1.154728	1.115351	1.077236	1.040291	1.004439
0.969609	0.935739	0.902778	0.870679	0.839404
0.808920	0.779200	0.750220	0.721963	0.694412
0.667556	0.641384	0.615888	0.591062	0.566899
0.543395	0.520546	0.498349	0.476799	0.455893
0.435626	0.415994	0.396993	0.378615	0.360856
0.343708	0.327164	0.311215	0.295853	0.281069

Row 73

1.076740	1.141575	1.210208	1.282901	1.359939
1.441645	1.528374	1.620528	1.718561	1.822990

1.934406	2.053493	2.181050	2.318015	2.465504
2.624860	2.797720	2.986108	3.192566	3.420351
3.673725	3.958405	4.282284	4.656622	5.098075
5.632054	6.296922	7.134672	8.027063	8.106769
7.263086	6.425114	5.761693	5.234065	4.802352
4.439894	4.129247	3.858652	3.619890	3.407021
3.215620	3.042306	2.884440	2.739915	2.607027
2.484370	2.370772	2.265244	2.166939	2.075129
1.989178	1.908530	1.832692	1.761227	1.693745
1.629895	1.569360	1.511857	1.457125	1.404932
1.355065	1.307331	1.261556	1.217581	1.175264
1.134477	1.095104	1.057042	1.020198	0.984490
0.949848	0.916206	0.883510	0.851711	0.820768
0.790646	0.761312	0.732743	0.704916	0.677813
0.651419	0.625722	0.600710	0.576373	0.552704
0.529697	0.507345	0.485643	0.464585	0.444166
0.424380	0.405221	0.386683	0.368760	0.351445
0.334731	0.318608	0.303069	0.288104	0.273703

Row 74

1.076702	1.141567	1.210239	1.282982	1.360086
1.441874	1.528707	1.620992	1.719188	1.823822
1.935495	2.054905	2.182869	2.320348	2.468494
2.628693	2.802646	2.992471	3.200849	3.431250
3.688280	3.978231	4.310031	4.696934	5.159840
5.734446	6.488947	7.575503	9.342476	9.584752
7.752817	6.631041	5.867922	5.295607	4.840255

4.463764	4.144048	3.867196	3.623884	3.407558
3.213434	3.037908	2.878195	2.732095	2.597836
2.473969	2.359289	2.252783	2.153588	2.060964
1.974266	1.892931	1.816463	1.744421	1.676413
1.612085	1.551123	1.493239	1.438175	1.385697
1.335593	1.287669	1.241751	1.197681	1.155314
1.114523	1.075190	1.037210	1.000491	0.964948
0.930508	0.897104	0.864680	0.833185	0.802574
0.772810	0.743859	0.715693	0.688288	0.661622
0.635679	0.610443	0.585900	0.562040	0.538851
0.516326	0.494456	0.473234	0.452653	0.432706
0.413386	0.394686	0.376599	0.359118	0.342235
0.325941	0.310228	0.295087	0.280508	0.266481

Row 75

1.075638	1.140433	1.209033	1.281701	1.358728
1.440438	1.527191	1.619396	1.717514	1.822072
1.933673	2.053019	2.180929	2.318371	2.466502
2.626718	2.800736	2.990692	3.199297	3.430069
3.687689	3.978579	4.311902	4.701374	5.168909
5.752800	6.529599	7.691466	10.030926	10.503786
7.885608	6.674041	5.885238	5.302071	4.841013
4.461054	4.138995	3.860423	3.615765	3.398330
3.203255	3.026887	2.866412	2.719608	2.584693
2.460208	2.344943	2.237881	2.138158	2.045032
1.957859	1.876077	1.799188	1.726754	1.658384
1.593727	1.532467	1.474320	1.419028	1.366358

1.316099	1.268059	1.222063	1.177953	1.135586
1.094833	1.055576	1.017710	0.981141	0.945783
0.911561	0.878408	0.846264	0.815076	0.784799
0.755392	0.726820	0.699052	0.672060	0.645823
0.620320	0.595534	0.571449	0.548051	0.525329
0.503272	0.481870	0.461114	0.440996	0.421507
0.402640	0.384386	0.366737	0.349685	0.333222
0.317338	0.302023	0.287270	0.273066	0.259403

Row 76

1.073547	1.138173	1.206589	1.279057	1.355865
1.437334	1.523824	1.615739	1.713535	1.817733
1.928933	2.047825	2.175219	2.312067	2.459508
2.618911	2.791954	2.980718	3.187834	3.416695
3.671779	3.959167	4.287401	4.668991	5.123220
5.681768	6.400544	7.380606	8.671449	8.807077
7.532890	6.532631	5.807621	5.251188	4.803594
4.431230	4.113781	3.838145	3.595411	3.379252
3.185021	3.009197	2.849052	2.702424	2.567571
2.443062	2.327710	2.220515	2.120627	2.027311
1.939935	1.857942	1.780842	1.708202	1.639635
1.574793	1.513366	1.455071	1.399655	1.346886
1.296554	1.248470	1.202461	1.158369	1.116051
1.075379	1.036235	0.998514	0.962120	0.926968
0.892981	0.860091	0.828236	0.797362	0.767422
0.738372	0.710176	0.682800	0.656217	0.630400
0.605328	0.580982	0.557343	0.534397	0.512129

0.490527	0.469580	0.449278	0.429610	0.410566
0.392139	0.374318	0.357095	0.340461	0.324405
0.308918	0.293992	0.279615	0.265778	0.252470

Row 77

1.070435	1.134793	1.202914	1.275056	1.351503
1.432572	1.518616	1.610031	1.707264	1.810825
1.921296	2.039351	2.165773	2.301481	2.447569
2.605345	2.776400	2.962690	3.166663	3.391428
3.641012	3.920745	4.237837	4.602275	5.028115
5.534925	6.146437	6.866649	7.534760	7.589505
6.971302	6.258768	5.650301	5.148813	4.730684
4.375685	4.069198	3.800841	3.563126	3.350526
3.158869	2.984932	2.826183	2.680590	2.546501
2.422553	2.307605	2.200693	2.100995	2.007798
1.920487	1.838518	1.761413	1.688749	1.620147
1.555265	1.493799	1.435472	1.380033	1.327256
1.276934	1.228879	1.182920	1.138902	1.096683
1.056135	1.017141	0.979596	0.943404	0.908480
0.874745	0.842131	0.810575	0.780022	0.750421
0.721730	0.693909	0.666923	0.640742	0.615339
0.590690	0.566775	0.543572	0.521066	0.499241
0.478083	0.457579	0.437718	0.418487	0.399877
0.381878	0.364479	0.347669	0.331440	0.315781
0.300682	0.286133	0.272123	0.258642	0.245679

Row 78

1.066311	1.130302	1.198018	1.269711	1.345660
1.426172	1.511591	1.602301	1.698736	1.801387
1.910814	2.027659	2.152669	2.286714	2.430816
2.586193	2.754308	2.936932	3.136243	3.354942
3.596422	3.864975	4.166048	4.506452	4.894195
5.336648	5.832538	6.343875	6.730744	6.761724
6.417867	5.925788	5.440212	5.006476	4.627895
4.297436	4.006998	3.749593	3.519611	3.312623
3.125126	2.954327	2.797974	2.654229	2.521576
2.398748	2.284676	2.178451	2.079288	1.986510
1.899524	1.817809	1.740902	1.668392	1.599913
1.535132	1.473754	1.415506	1.360146	1.307451
1.257218	1.209263	1.163418	1.119529	1.077458
1.037076	0.998270	0.960932	0.924969	0.890295
0.856830	0.824507	0.793260	0.763035	0.733779
0.705448	0.678002	0.651403	0.625621	0.600627
0.576394	0.552901	0.530126	0.508050	0.486657
0.465932	0.445860	0.426428	0.407624	0.389436
0.371853	0.354863	0.338456	0.322621	0.307348
0.292626	0.278444	0.264791	0.251657	0.239031

Row 79

1.061187	1.124716	1.191920	1.263045	1.338360
1.418162	1.502783	1.592592	1.688003	1.789483
1.897562	2.012845	2.136029	2.267917	2.409447

2.561718	2.726029	2.903925	3.097252	3.308225
3.539492	3.794181	4.075853	4.388168	4.733767
5.111050	5.505834	5.873708	6.121398	6.142526
5.929572	5.583779	5.203350	4.837390	4.502311
4.200526	3.929621	3.685948	3.465889	3.266242
3.084284	2.917734	2.764684	2.623535	2.492942
2.371759	2.259009	2.153852	2.055555	1.963483
1.877074	1.795832	1.719317	1.647135	1.578933
1.514391	1.453222	1.395165	1.339981	1.287456
1.237390	1.189605	1.143935	1.100231	1.058356
1.018184	0.979600	0.942502	0.906795	0.872392
0.839217	0.807198	0.776272	0.746383	0.717477
0.689510	0.662438	0.636226	0.610840	0.586248
0.562426	0.539348	0.516992	0.495338	0.474368
0.454065	0.434415	0.415401	0.397013	0.379236
0.362058	0.345467	0.329452	0.314001	0.299104
0.284748	0.270924	0.257619	0.244823	0.232524

Row 80

1.055083	1.118057	1.184647	1.255087	1.329638
1.408584	1.492242	1.580960	1.675132	1.775195
1.881643	1.995036	2.116010	2.245292	2.383720
2.532255	2.692012	2.864278	3.050538	3.252481
3.471989	3.711038	3.971438	4.254186	4.557984
4.876068	5.190191	5.462338	5.633451	5.649525
5.507061	5.256580	4.958490	4.653326	4.361066
4.089354	3.839868	3.611748	3.403210	3.212256

3.036968	2.875609	2.726651	2.588764	2.460792
2.341734	2.230720	2.126986	2.029866	1.938770
1.853175	1.772618	1.696682	1.624993	1.557216
1.493045	1.432205	1.374443	1.319531	1.267260
1.217438	1.169891	1.124458	1.080992	1.039360
0.999438	0.961115	0.924287	0.888862	0.854754
0.821886	0.790187	0.759594	0.730049	0.701499
0.673899	0.647204	0.621377	0.596383	0.572192
0.548774	0.526105	0.504161	0.482921	0.462365
0.442475	0.423236	0.404633	0.386649	0.369272
0.352489	0.336287	0.320653	0.305577	0.291045
0.277047	0.263570	0.250605	0.238138	0.226158

Row 81

1.048022	1.110352	1.176227	1.245873	1.319535
1.397486	1.480024	1.567476	1.660207	1.758625
1.863181	1.974383	2.092802	2.219080	2.353942
2.498203	2.652781	2.818693	2.997055	3.189041
3.395804	3.618287	3.856846	4.110500	4.375504
4.642901	4.894969	5.102351	5.227481	5.240566
5.139779	4.952680	4.716976	4.463259	4.210409
3.968136	3.740591	3.528953	3.332947	3.151647
2.983892	2.828483	2.684276	2.550219	2.425362
2.308858	2.199950	2.097966	2.002308	1.912440
1.827883	1.748208	1.673027	1.601989	1.534778
1.471105	1.410706	1.353342	1.298794	1.246860
1.197355	1.150112	1.104974	1.061798	1.020456

0.980825 0.942797 0.906271 0.871154 0.837363
0.804821 0.773457 0.743208 0.714017 0.685830
0.658600 0.632284 0.606842 0.582240 0.558445
0.535427 0.513162 0.491623 0.470789 0.450639
0.431155 0.412319 0.394114 0.376526 0.359540
0.343142 0.327318 0.312056 0.297344 0.283169
0.269519 0.256382 0.243746 0.231600 0.219932

Row 82

1.040031 1.101632 1.166698 1.235444 1.308102
1.384927 1.466198 1.552219 1.643326 1.739890
1.842318 1.951062 2.066622 2.189551 2.320456
2.460003 2.608907 2.767924 2.937812 3.119269
3.312805 3.518512 3.735648 3.961929 4.192379
4.417686 4.622449 4.784822 4.880371 4.891500
4.817169 4.673526 4.484781 4.273334 4.055302
3.840565 3.634465 3.439494 3.256503 3.085446
2.925826 2.776937 2.638002 2.508244 2.386920
2.273339 2.166867 2.066925 1.972987 1.884577
1.801264 1.722655 1.648393 1.578155 1.511643
1.448586 1.388737 1.331868 1.277771 1.226252
1.177136 1.130260 1.085473 1.042639 1.001631
0.962331 0.924633 0.888439 0.853656 0.820204
0.788006 0.756992 0.727100 0.698272 0.670454
0.643600 0.617665 0.592609 0.568397 0.544996
0.522375 0.500508 0.479369 0.458934 0.439183
0.420095 0.401653 0.383840 0.366638 0.350033

0.334011 0.318557 0.303658 0.289301 0.275473
0.262162 0.249355 0.237042 0.225208 0.213843

Row 83

1.031141 1.091933 1.156101 1.223848 1.295393
1.370971 1.450841 1.535282 1.624597 1.719120
1.819212 1.925265 2.037708 2.157000 2.283633
2.418121 2.560989 2.712740 2.873812 3.044485
3.224738 3.414007 3.610796 3.812088 4.012506
4.203348 4.371903 4.502077 4.577531 4.587280
4.530687 4.417779 4.264587 4.087424 3.899416
3.709665 3.523843 3.345164 3.175236 3.014684
2.863556 2.721575 2.588299 2.463207 2.345756
2.235410 2.131655 2.034009 1.942021 1.855278
1.773394 1.696020 1.622830 1.553528 1.487839
1.425512 1.366314 1.310032 1.256468 1.205440
1.156780 1.110332 1.065952 1.023508 0.982877
0.943946 0.906612 0.870778 0.836355 0.803264
0.771428 0.740780 0.711256 0.682801 0.655360
0.628885 0.603334 0.578666 0.554844 0.531834
0.509607 0.488134 0.467389 0.447348 0.427988
0.409290 0.391234 0.373803 0.356979 0.340747
0.325091 0.309998 0.295453 0.281442 0.267954
0.254973 0.242489 0.230489 0.218960 0.207891

Row 84

1.021386	1.081293	1.144481	1.211139	1.281470
1.355691	1.434038	1.516763	1.604139	1.696458
1.794033	1.897199	2.006311	2.121736	2.243854
2.373035	2.509625	2.653903	2.806024	2.965921
3.133159	3.306709	3.484613	3.663536	3.838215
4.000951	4.141511	4.248004	4.309199	4.317914
4.273737	4.183195	4.057228	3.907779	3.745312
3.577790	3.410703	3.247552	3.090401	2.940345
2.797854	2.663006	2.535647	2.415489	2.302175
2.195315	2.094512	1.999379	1.909542	1.824647
1.744360	1.668372	1.596393	1.528153	1.463402
1.401909	1.343457	1.287848	1.234897	1.184430
1.136290	1.090327	1.046406	1.004398	0.964186
0.925661	0.888723	0.853278	0.819240	0.786530
0.755075	0.724807	0.695664	0.667591	0.640534
0.614445	0.589281	0.565001	0.541568	0.518949
0.497113	0.476030	0.455674	0.436021	0.417047
0.398731	0.381054	0.363997	0.347543	0.331676
0.316379	0.301638	0.287439	0.273766	0.260608
0.247950	0.235781	0.224086	0.212854	0.202073

Row 85

1.010805	1.069757	1.131888	1.197373	1.266399
1.339163	1.415878	1.496770	1.582076	1.672051
1.766959	1.867078	1.972688	2.084074	2.201503
2.325218	2.455402	2.592137	2.735343	2.884679

3.039407	3.198193	3.358848	3.517999	3.670766
3.810548	3.929190	4.017826	4.068537	4.076440
4.041258	3.967409	3.862566	3.735569	3.594689
3.446697	3.296639	3.148018	3.003120	2.863340
2.729454	2.601818	2.480521	2.365475	2.256488
2.153306	2.055645	1.963205	1.875687	1.792798
1.714255	1.639789	1.569144	1.502081	1.438373
1.377809	1.320192	1.265336	1.213070	1.163231
1.115671	1.070249	1.026834	0.985307	0.945554
0.907471	0.870960	0.835931	0.802301	0.769993
0.738936	0.709063	0.680313	0.652631	0.625965
0.600267	0.575493	0.551604	0.528561	0.506332
0.484884	0.464188	0.444217	0.424946	0.406351
0.388411	0.371107	0.354417	0.338326	0.322816
0.307870	0.293473	0.279611	0.266269	0.253433
0.241090	0.229227	0.217831	0.206889	0.196388

Row 86

0.999437	1.057370	1.118375	1.182612	1.250251
1.321470	1.396458	1.475413	1.558540	1.646055
1.738174	1.835119	1.937103	2.044327	2.156962
2.275130	2.398875	2.528115	2.662579	2.801721
2.944598	3.089702	3.234773	3.376579	3.510736
3.631681	3.732932	3.807803	3.850573	3.857815
3.829335	3.768222	3.679995	3.571279	3.448608
3.317648	3.182898	3.047691	2.914368	2.784489
2.659035	2.538574	2.423382	2.313542	2.209005

2.109641	2.015263	1.925660	1.840600	1.759851
1.683177	1.610350	1.541150	1.475366	1.412796
1.353249	1.296546	1.242518	1.191004	1.141855
1.094931	1.050101	1.007240	0.966235	0.926978
0.889369	0.853315	0.818729	0.785530	0.753644
0.723002	0.693537	0.665192	0.637911	0.611644
0.586342	0.561963	0.538465	0.515813	0.493972
0.472910	0.452598	0.433008	0.414115	0.395894
0.378325	0.361386	0.345057	0.329321	0.314160
0.299558	0.285498	0.271966	0.258946	0.246426
0.234390	0.222826	0.211720	0.201061	0.190835

Row 87

0.987325	1.044181	1.103997	1.166919	1.233098
1.302695	1.375874	1.452806	1.533665	1.618625
1.707862	1.801541	1.899812	2.002803	2.110594
2.223207	2.340563	2.462448	2.588447	2.717869
2.849641	2.982187	3.113282	3.239928	3.358270
3.463658	3.550929	3.614977	3.651582	3.658270
3.634900	3.583694	3.508708	3.414977	3.307677
3.191516	3.070426	2.947481	2.824967	2.704510
2.587214	2.473791	2.364665	2.260053	2.160030
2.064570	1.973578	1.886919	1.804428	1.725927
1.651228	1.580143	1.512483	1.448068	1.386719
1.328268	1.272553	1.219419	1.168719	1.120318
1.074082	1.029890	0.987627	0.947183	0.908458
0.871355	0.835786	0.801667	0.768921	0.737476

0.707264 0.678223 0.650294 0.623423 0.597561
0.572661 0.548679 0.525576 0.503315 0.481861
0.461184 0.441253 0.422041 0.403521 0.385670
0.368465 0.351885 0.335911 0.320524 0.305706
0.291440 0.277709 0.264500 0.251795 0.239582
0.227847 0.216575 0.205753 0.195369 0.185411

Row 88

0.974514 1.030241 1.088812 1.150360 1.215018
1.282927 1.354229 1.429067 1.507584 1.589921
1.676206 1.766558 1.861069 1.959797 2.062748
2.169853 2.280937 2.395682 2.513566 2.633804
2.755260 2.876355 2.994973 3.108389 3.213256
3.305702 3.381595 3.436987 3.468703 3.474914
3.455517 3.412147 3.347844 3.266487 3.172197
3.068876 2.959920 2.848108 2.735604 2.624025
2.514537 2.407943 2.304774 2.205353 2.109854
2.018340 1.930797 1.847158 1.767318 1.691151
1.618513 1.549252 1.483215 1.420247 1.360194
1.302909 1.248246 1.196067 1.146239 1.098636
1.053137 1.009628 0.968002 0.928156 0.889994
0.853427 0.818370 0.784742 0.752469 0.721483
0.691717 0.663112 0.635609 0.609158 0.583708
0.559214 0.535633 0.512927 0.491058 0.469992
0.449698 0.430146 0.411307 0.393157 0.375670
0.358825 0.342599 0.326974 0.311929 0.297447
0.283510 0.270102 0.257208 0.244812 0.232900

0.221457 0.210470 0.199926 0.189811 0.180114

Row 89

0.961049 1.015601 1.072880 1.133002 1.196087

1.262253 1.331622 1.404311 1.480434 1.560095

1.643387 1.730380 1.821115 1.915590 2.013747

2.115441 2.220423 2.328294 2.438462 2.550087

2.662018 2.772721 2.880226 2.982094 3.075438

3.157036 3.223559 3.271921 3.299688 3.305483

3.289225 3.252144 3.196561 3.125498 3.042261

2.950083 2.851879 2.750127 2.646832 2.543557

2.441478 2.341452 2.244078 2.149761 2.058751

1.971186 1.887120 1.806547 1.729416 1.655646

1.585136 1.517769 1.453422 1.391966 1.333273

1.277214 1.223661 1.172491 1.123585 1.076828

1.032109 0.989324 0.948372 0.909157 0.871591

0.835587 0.801065 0.767950 0.736170 0.705659

0.676354 0.648197 0.621131 0.595107 0.570076

0.545994 0.522818 0.500510 0.479034 0.458355

0.438444 0.419268 0.400801 0.383016 0.365890

0.349399 0.333522 0.318239 0.303531 0.289379

0.275765 0.262673 0.250088 0.237994 0.226376

0.215219 0.204511 0.194237 0.184385 0.174942

Row 90

0.946978	1.000315	1.056260	1.114915	1.176382
1.240762	1.308155	1.378654	1.452346	1.529302
1.609579	1.693206	1.780179	1.870445	1.963888
2.060309	2.159397	2.260697	2.363574	2.467168
2.570342	2.671642	2.769261	2.861033	2.944480
3.016916	3.075643	3.118215	3.142744	3.148168
3.134426	3.102459	3.054066	2.991631	2.917825
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2.368448	2.274690	2.182912	2.093571	2.006978
1.923332	1.842742	1.765254	1.690864	1.619535
1.551202	1.485781	1.423178	1.363290	1.306010
1.251229	1.198836	1.148724	1.100785	1.054916
1.011016	0.968991	0.928746	0.890194	0.853250
0.817834	0.783872	0.751290	0.720021	0.690001
0.661171	0.633473	0.606854	0.581266	0.556660
0.532994	0.510227	0.488320	0.467237	0.446946
0.427414	0.408613	0.390515	0.373092	0.356322
0.340182	0.324649	0.309703	0.295325	0.281497
0.268200	0.255418	0.243136	0.231336	0.220006
0.209129	0.198693	0.188684	0.179088	0.169893

Row 91

0.932348	0.984437	1.039014	1.096166	1.155981
1.218542	1.283928	1.352211	1.423449	1.497687
1.574948	1.655226	1.738476	1.824603	1.913445
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2.480552	2.573358	2.662179	2.745106	2.820013

2.884655	2.936828	2.974577	2.996411	3.001502
2.989800	2.962040	2.919632	2.864481	2.798760
2.724703	2.644445	2.559906	2.472745	2.384337
2.295794	2.207984	2.121571	2.037049	1.954772
1.874984	1.797842	1.723435	1.651800	1.582936
1.516813	1.453376	1.392560	1.334283	1.278461
1.225001	1.173811	1.124796	1.077864	1.032920
0.989875	0.948642	0.909135	0.871273	0.834978
0.800174	0.766791	0.734761	0.704019	0.674506
0.646162	0.618935	0.592773	0.567627	0.543453
0.520208	0.497852	0.476348	0.455660	0.435756
0.416604	0.398176	0.380443	0.363380	0.346962
0.331167	0.315973	0.301360	0.287307	0.273797
0.260811	0.248333	0.236347	0.224836	0.213787
0.203184	0.193014	0.183263	0.173918	0.164966

Row 92

0.917207	0.968021	1.021201	1.076824	1.134961
1.195679	1.259039	1.325090	1.393868	1.465392
1.539654	1.616619	1.696206	1.778286	1.862662
1.949053	2.037077	2.126224	2.215833	2.305064
2.392877	2.478015	2.559001	2.634158	2.701659
2.759624	2.806240	2.839925	2.859489	2.864278
2.854249	2.829983	2.792602	2.743642	2.684884
2.618197	2.545405	2.468191	2.388043	2.306231
2.223804	2.141610	2.060316	1.980434	1.902349
1.826337	1.752593	1.681241	1.612355	1.545964

1.482069	1.420642	1.361642	1.305009	1.250679
1.198577	1.148625	1.100744	1.054851	1.010865
0.968705	0.928293	0.889551	0.852404	0.816780
0.782610	0.749826	0.718365	0.688166	0.659172
0.631327	0.604580	0.578882	0.554187	0.530450
0.507630	0.485689	0.464589	0.444296	0.424779
0.406007	0.387949	0.370580	0.353873	0.337804
0.322350	0.307491	0.293204	0.279472	0.266274
0.253594	0.241414	0.229718	0.218491	0.207717
0.197382	0.187472	0.177973	0.168873	0.160158

Row 93

0.901605	0.951120	1.002882	1.056956	1.113398
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1.503846	1.577549	1.653552	1.731695	1.811755
1.893428	1.976312	2.059890	2.143510	2.226364
2.307476	2.385693	2.459691	2.527999	2.589049
2.641256	2.683119	2.713347	2.730980	2.735491
2.726847	2.705510	2.672384	2.628720	2.575988
2.515757	2.449590	2.378958	2.305192	2.229450
2.152718	2.075807	1.999374	1.923938	1.849901
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1.447066	1.387662	1.330497	1.275532	1.222720
1.172003	1.123319	1.076599	1.031774	0.988774
0.947526	0.907961	0.870007	0.833598	0.798666
0.765147	0.732979	0.702102	0.672460	0.643997
0.616662	0.590406	0.565180	0.540941	0.517646

0.495255 0.473731 0.453038 0.433141 0.414011
0.395616 0.377928 0.360920 0.344566 0.328842
0.313726 0.299197 0.285233 0.271815 0.258925
0.246545 0.234657 0.223246 0.212296 0.201792
0.191719 0.182063 0.172811 0.163950 0.155466

Row 94

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1.467663 1.538171 1.610681 1.685012 1.760920
1.838084 1.916096 1.994441 2.072483 2.149456
2.224452 2.296419 2.364173 2.426425 2.481828
2.529038 2.566806 2.594068 2.610040 2.614295
2.606806 2.587944 2.558448 2.519341 2.471848
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1.728829 1.661663 1.596282 1.532812 1.471334
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1.145327 1.097931 1.052396 1.008663 0.966671
0.926358 0.887661 0.850516 0.814864 0.780642
0.747791 0.716255 0.685976 0.656903 0.628983
0.602167 0.576409 0.551662 0.527885 0.505037
0.483079 0.461975 0.441689 0.422190 0.403446
0.385428 0.368107 0.351457 0.335453 0.320072
0.305290 0.291086 0.277440 0.264333 0.251745
0.239659 0.228059 0.216927 0.206249 0.196009
0.186193 0.176786 0.167775 0.159147 0.150889

Row 95

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2.422511	2.456725	2.481421	2.495953	2.499971
2.493452	2.476699	2.450317	2.415155	2.372237
2.322686	2.267653	2.208265	2.145574	2.080537
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1.680272	1.616259	1.553768	1.492940	1.433878
1.376646	1.321284	1.267807	1.216213	1.166484
1.118593	1.072503	1.028170	0.985547	0.944582
0.905222	0.867410	0.831093	0.796213	0.762717
0.730550	0.699658	0.669990	0.641497	0.614129
0.587841	0.562588	0.538327	0.515017	0.492620
0.471097	0.450415	0.430538	0.411436	0.393079
0.375437	0.358482	0.342188	0.326531	0.311488
0.297036	0.283154	0.269822	0.257020	0.244730
0.232934	0.221616	0.210758	0.200347	0.190365
0.180800	0.171636	0.162861	0.154462	0.146425

Row 96

0.852495	0.898035	0.945477	0.994849	1.046173
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1.099460 1.154709 1.211903 1.271006 1.331959
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2.321259 2.352370 2.374831 2.388105 2.391903
2.386203 2.371257 2.347566 2.315836 2.276931
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1.341398 1.288036 1.236396 1.186488 1.138310
1.091846 1.047071 1.003954 0.962454 0.922531
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0.713429 0.683194 0.654147 0.626243 0.599437
0.573684 0.548943 0.525173 0.502335 0.480391
0.459307 0.439048 0.419582 0.400877 0.382906
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0.288962 0.275398 0.262375 0.249874 0.237877
0.226366 0.215324 0.204736 0.194585 0.184857
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Row 97

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1.358100 1.419522 1.482202 1.545921 1.610412
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2.224912 2.253297 2.273797 2.285965 2.289556

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0.696438	0.666869	0.638452	0.611146	0.584907
0.559696	0.535472	0.512198	0.489835	0.468349
0.447705	0.427871	0.408815	0.390509	0.372922
0.356027	0.339798	0.324210	0.309240	0.294864
0.281062	0.267812	0.255094	0.242890	0.231181
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0.170404	0.161712	0.153394	0.145435	0.137825

Row 98

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1.038484	0.996351	0.955680	0.916452	0.878639
0.842211	0.807134	0.773372	0.740886	0.709636
0.679584	0.650688	0.622909	0.596207	0.570543
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0.436289	0.416881	0.398236	0.380327	0.363124
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0.165396	0.156932	0.148834	0.141090	0.133686

Row 99

0.800890	0.842434	0.885560	0.930270	0.976558
1.024405	1.073780	1.124633	1.176898	1.230483
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0.821409	0.787259	0.754364	0.722692	0.692207
0.662875	0.634660	0.607524	0.581431	0.556346
0.532233	0.509057	0.486783	0.465380	0.444815
0.425057	0.406075	0.387841	0.370328	0.353508

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0.160510 0.152270 0.144388 0.136852 0.129650

Row 100

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1.249188 1.302399 1.356321 1.410735 1.465378
1.519945 1.574083 1.627391 1.679418 1.729667
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1.201869 1.156208 1.111702 1.068403 1.026349
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0.800742 0.767521 0.735497 0.704642 0.674927
0.646320 0.618789 0.592300 0.566821 0.542319
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0.328287 0.313133 0.298586 0.284624 0.271225
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0.155744 0.147723 0.140053 0.132722 0.125716

Particle Traces

Number of Particle-traces = 0

**APPENDIX E:
SIGNED NEIGHBORHOOD AGREEMENTS**

September 25, 2007

Marigold Love
Avis Acres Preservation Coalition
Tucson, Arizona

Subject: **Neighborhood Agreement**
Wilmot/Kolb Plan Amendment, Co7-07-25

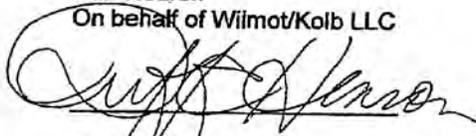
Avis Acres Homeowners:

This Neighborhood Agreement is written in response to requests from the property owners of Avis Acres Preservation Coalition regarding the 186-acre Wilmot/Kolb Plan Amendment, Co7-07-25. Neighbors have agreed to support the Wilmot/Kolb Plan Amendment on the condition that the Property be made subject to the following conditions, restrictions and design guidelines necessary to insure that the conceptual plan will be compatible with surrounding land uses. This Neighborhood Agreement shall be admitted into plan amendment case file, Co7-07-25, as restrictions on this Property. The property owner, subject to plan amendment and rezoning approval by the Pima County Board of Supervisors, is agreeing to the following stipulations.

1. The owner/developer shall reduce the plan amendment request from Medium Intensity Urban (MIU) to Low Intensity Urban (LIU 3.0) and the overall maximum residences per acre to 3 residences per acre.
2. If the owner/developer sells the property, any subsequent landowner who buys the land will be subject to the plan change, zoning restrictions and other agreements made by the current owner.
3. The owner/developer shall enter into a service agreement with a water utility.
4. No wells will be allowed to be drilled on the lots.
5. The owner/developer shall provide a transitional landscape and density buffer on areas that immediately border the existing homesites. The density along this border shall consist of a row of houses on lots having no more than 1 house per acre.
6. The homesites within the density buffer shall be limited to one-story in height.
7. Before the land is developed, Wilmot Road will be paved and improved to allow for all weather access to Sahuarita Road.

September 25, 2007
Marigold Love
Wilmot/Kolb Plan Amendment
Page 2
job#/location code

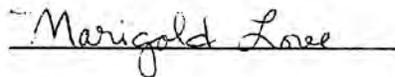
Duff Hearon
On behalf of Wilmot/Kolb LLC



Marigold Love

After sharing this agreement with our 45 member E-mail group plus two additional members by hand delivery, I have received no dissenting comments. Therefore, the Avis Acres Preservation Coalition will support the Wilmot/Kolb plan amendment for LIU 3.0 before the Planning & Zoning Commissioners on September 26, 2007.

Marigold Love, Moderator
Avis Acres Preservation Coalition



December 6, 2007

Avis Acres Preservation Coalition
Sahuarita, Arizona

Subject: **Neighborhood Agreement**
Wilmot/Kolb Plan Amendment, Co7-07-25

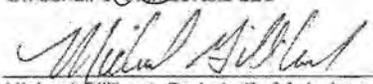
Avis Acres Preservation Coalition:

This Neighborhood Agreement is written in response to requests from the property owners of Avis Acres Preservation Coalition regarding the 186-acre Wilmot/Kolb Plan Amendment, Co7-07-25, hereafter referred to as the Property. Avis Acres Preservation Coalition has agreed to support the Wilmot/Kolb Plan Amendment on the condition that the Property be made subject to the following conditions, restrictions and design guidelines necessary to insure that the conceptual plan will be compatible with surrounding land uses. This Neighborhood Agreement shall be recorded with the land and shall be admitted into plan amendment case file, Co7-07-25, as necessary restrictions on this Property. The property owner, subject to plan amendment and rezoning approval by the Pima County Board of Supervisors, is agreeing to the following stipulations.

1. The owner/developer shall reduce the plan amendment request from Medium intensity Urban (MIU) to Low Intensity Urban (LIU 3.0) and the overall maximum residences per acre to 3 residences per acre.
2. If the owner/developer sells the Property, any subsequent landowner who buys the Property will be subject to the plan change, zoning restrictions and other agreements made by the current owner.
3. The owner/developer shall enter into a service agreement with a remote water utility.
4. No water wells shall be drilled on the Property.
5. The owner/developer shall provide a transition area along the southern and southeastern boundaries of the Property that immediately border current adjacent existing parcels and extends north beyond parcel 28M the distance of an additional two acre lot including:
 - a. A 20-foot enhanced landscape buffer along the existing property line as shown on Attachment A: The Transition Plan.
 - b. A 150-foot building setback as shown on Attachment A: The Transition Plan.
 - c. A minimum lot size of two acres.
 - d. A minimum lot depth of 300 feet as shown in Attachment A: The Transition Plan.
 - e. Homes within this area will be limited to one story (20) feet in height.
 - f. The building envelope for home, patio, driveway, etc. will be restricted to 25% of the square footage of the individual lot.
 - g. The remainder of the lot will be subject to a conservation easement.

6. Before the Property is developed, Wilmot Road will be paved and improved to allow for all weather access to Sahuarita Road.
7. Drainage conditions, created by the development of the Property, that negatively impact the Avis Acres neighborhood, shall be corrected by the developer.
8. A master traffic impact study will be prepared and implemented to address infrastructure issues.
9. The perimeter of the Property will continue to be fenced until development begins and permanently on a portion of the perimeter (as shown on Attachment A: The Transition Plan), thereafter.
10. Residential densities will transition from the lowest along the southern and southeastern boundaries to the highest in the north and west along Wilmot Road. (See Attachment A: The Transition Plan.)
11. Development will be clustered on the site, maintaining an overall average density on the site of no more than 3 homes per acre. Undeveloped open space will be subject to a conservation easement.
12. Recreation areas will be provided on site during the creation of the development (as opposed to sometime in the future). These areas will be located away from and screened from current adjacent parcels in Avis Acres.
13. An eight foot high wall, extending the entire length of the west property line of Parcel 305-23-028M, shall be built just east of the west property line.
14. The 20-foot enhanced landscape buffer (see 5.a.) shall be planted, deep watered and maintained to provide maximum opportunity for growth of the trees prior to the completion of the development. This planting shall be done at the beginning of the development process, as soon as development access roads are created.


Duff Hearon
On behalf of Wilmot/Kolb LLC


Michael Gilliland, On behalf of Avis Acres Preservation Coalition
After sharing this agreement with our 45 member Avis Acres Preservation Coalition E-mail group, we have received no dissenting comments. Therefore, the Avis Acres Preservation Coalition will support the Wilmot/Kolb Plan Amendment Co7-07-25 for LIU 3.0 at the Board of Supervisors Hearing on December 11, 2007.

ATTACHMENT A: THE TRANSITION PLAN



WILMOT ROAD 186 ACRE

Inside back Cover



Engineering and Environmental Consultants, Inc.

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