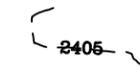


**LEGEND**



Subject Property



Existing Condition Topographic Contour  
(1' Interval)

Average Cross Slope = 1.82%

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**EXHIBIT I-B.1a-e**  
 TOPOGRAPHIC  
 CHARACTERISTICS  
 PAGE 11

## **C. HYDROLOGY**

### **1. Off-Site Watersheds**

CMG Drainage Engineering, Inc. (CMG) has completed a comprehensive preliminary drainage assessment for four (4) specific properties controlled by Red Point Development, all of which are concurrently proceeding through the rezoning process. This CMG assessment is the source work used in this Site Analysis to present the specific hydrologic findings pertaining to the subject Cortaro Farms Road/Thornycdale Road property. For this reason, the numbering of concentration points (e.g. CP-6) indicated in the Table below and on the accompanying exhibits has been taken as-is from the original CMG source work.

The findings presented here are based on the above assessment, the results of previous study information, such as FEMA/FIRM flood insurance mapping, as well as more recent hydrologic computations using the PC Hydro method.

Three (3) offsite watersheds contribute flow to, and were delineated for, the subject property (see Exhibit I-C.1). Surface drainage flows originate from the northeast or east and enter the site along its respective north and east property boundaries. All of the washes exist in a natural condition, but some constructed channels are present within the upstream watersheds, most notably within the upstream Sunnyvale subdivision, where a fully-lined, man-made channel conveys flow for a significant distance before returning it to natural conditions.

CP-7 enters along the east property line. The upstream drainage area at CP-7 is 182.4 acres. CP-7 combines with CP-13 and then flows to CP-6, at the southwest corner of the property. The upstream drainage area at CP-6 is 258.8 acres.

CP-13 enters at the northeast property corner via a dip section in Thornycdale Road, then drains to CP-6. The upstream drainage area at CP-13 is 32.5 acres.

CP-14 is the concentration point for a small onsite watershed that exits along the west property boundary. The upstream drainage area at CP-14 is 48.3 acres.

CP-15 enters the property along the north property boundary, then exits along the west boundary a short distance downstream at CP-14. The upstream drainage area at CP-15 is 34.0 acres. CP-14 and CP-15 drain across a dip section in Cortaro Farms Road, then into an existing detention basin that was built in conjunction with the rental homes project located there.

### **2. Off-Site Natural or Man-Made Features**

There is a small number of constructed channels and detention basins within the upstream contributing watersheds. Other than that, there are no other remarkable natural or man-made features within them. No offsite features will be affected by the surface drainage traversing this property.

### 3. Acreages & Discharges of Watersheds

The upstream areas of the offsite watersheds contributing to this property were described above in Item 1. They are summarized in the following Table, along with their existing (pre-development) 100-year peak discharges.

<b>Summary of 100-Year Peak Discharges</b>		
Concentration Point Number	Q <sub>100</sub> (cfs)	Drainage Area (Acres)
6	646	258.8
7	548	182.4
13	189	32.5
14	225	48.3
15	171	34.0

### 4. On-Site Hydrology

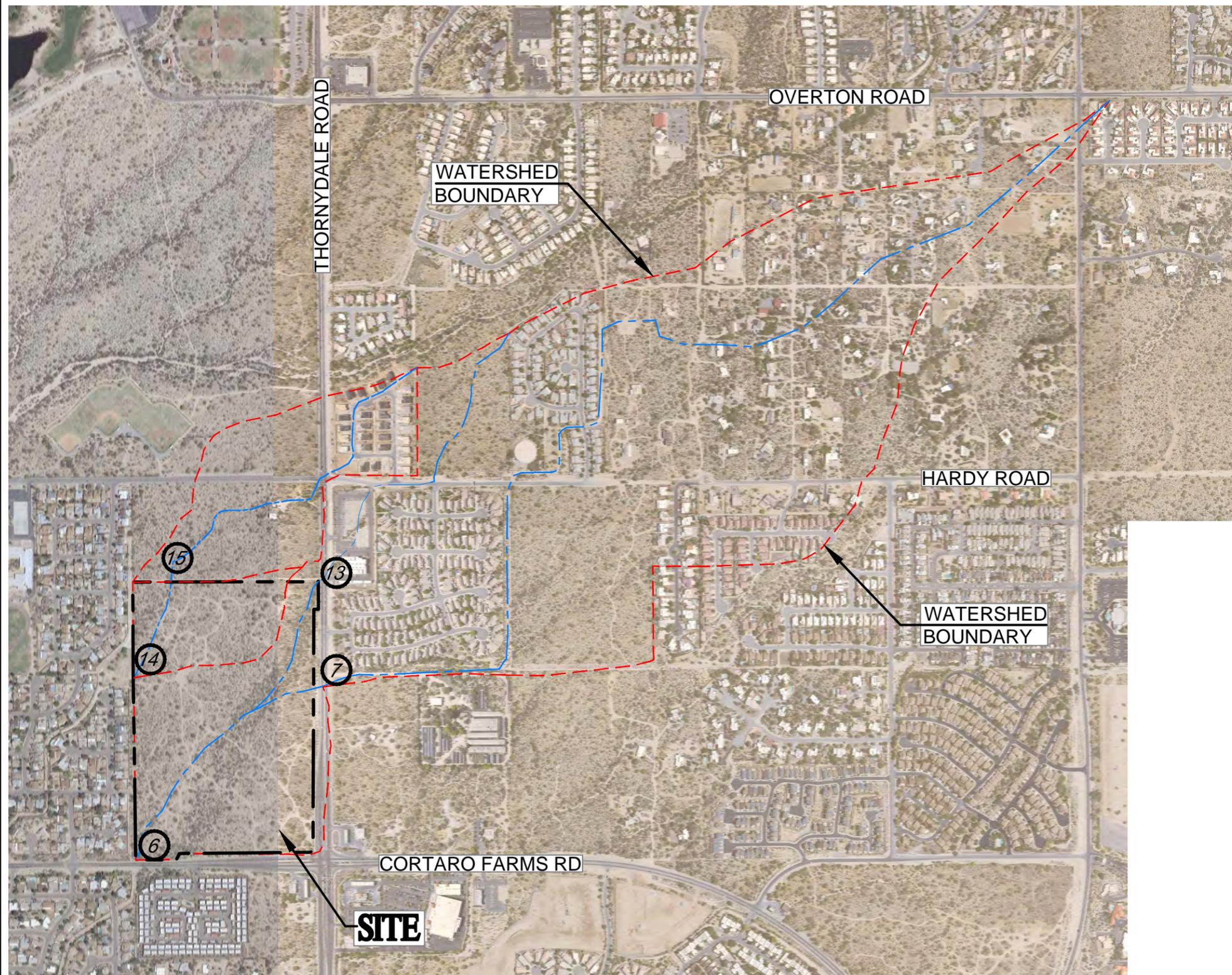
The rezoning site is vacant and undeveloped in the existing condition. The project parcel consists of 100% pervious soils of hydrologic soil Types A, B & C. See Exhibit I.C.4a-g in support of the following:

- a. The approximate 100-year regulatory floodplains have been delineated on the Exhibit for the washes in excess of 100 cfs traversing the site. Pima County Regional Flood Control District flood hazard maps show the entire property as subject to sheet flooding at an average depth of 0.5 feet.
- b. No FEMA mapped floodplains exist on this property.
- c. The site features three (3) incoming concentration points (CP-7, 13 & 15) with peak discharges in excess of 100 cfs entering the property. Peak discharges were determined by the Pima County Regional Flood Control District (PCRFCDD) hydrology methods and the PC-Hydro computer program.
- d. The existing washes traversing the site exit the property in their natural state.
- e. The site contains riparian habitat area regulated per the Pima County RFCDD Flood Hazard Map; same is delineated on Exhibit I-C.2.
- f. The site contains no existing hydraulic structures or manmade hydraulic features.
- g. There are no sources of perennial surface water located on the site.
- h. According to Pima County Ordinance No. 2010 FC-5, 16.28.030, erosion hazard and building setback distances are required for the above-described watercourses traversing the property.

**5. Qualitative Description of Downstream Drainage Conditions**

The on-site washes exit the subject site in their natural condition, but then enter man-made drainage features either within the existing residential subdivision to the west or within the existing rental-home project and residential subdivision to the south/southwest

**Exhibits to Follow**



## LEGEND



Subject Property



Watershed Boundary



Flow Centerline

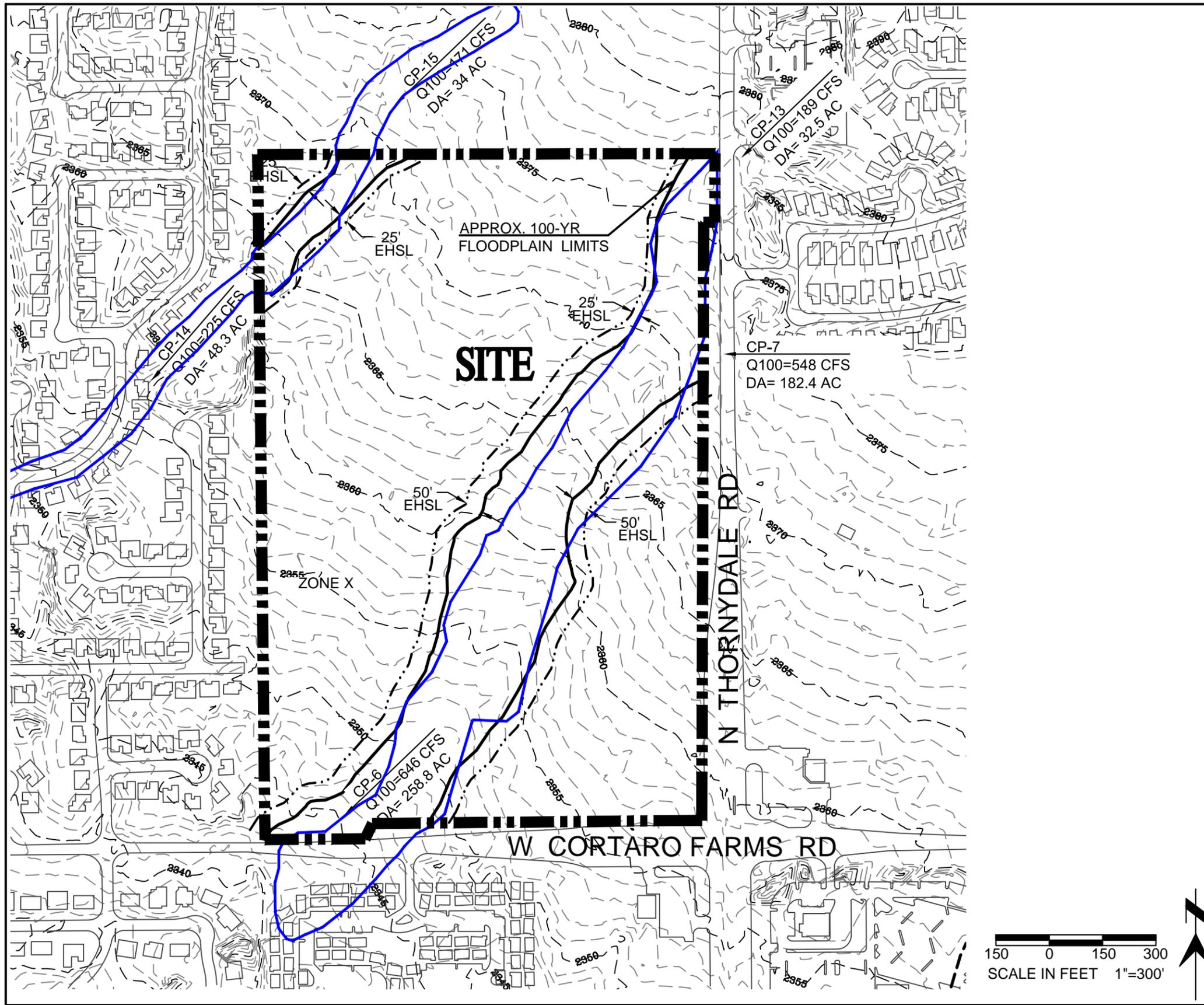


Concentration Point (CP)

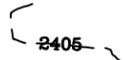
### WATERSHED SUMMARY TABLE

CONCENTRATION POINT ID	Q100 (CFS)	DA (AC)
6 (incl. CP-7)	646	258.8
7	548	182.4
13	189	32.5
14 (incl. CP-15)	225	48.3
15	171	34.0

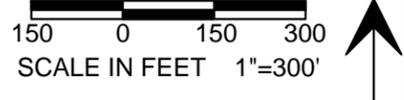
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**LEGEND**

-  Subject Property
-  Existing Condition Topographic Contour (1' Interval)
-  Approximate Erosion Hazard Setback Limit (EHSL)
-  Approximate 100-Year Floodplain Limit
-  Mapped Riparian Habitat -- Xeroriparian "C"

NOTE:  
The entire subject property is shown on RFCO Flood Hazard maps as a sheet flow zone with an average depth of 0.5 feet.



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EXHIBIT I-C.4a-e  
ONSITE HYDROLOGY  
  
PAGE 16

**D. BIOLOGICAL RESOURCES**

**1. Conservation Lands System**

The entire site (54.95 AC) falls within the Maeveen Marie Behan Conservation Lands System (MMBCLS) and is classified as CLS *Multiple Use Management Area* and *Special Species Management Area (SSMA)*. While not a CLS designation, it should be noted that the site is also underlaid, in part, by Xeroriparian “C” regulated habitat. Exhibit I-D.1.2 shows the limits of these areas within the property.

**2. Critical Landscape Linkages**

There are no Critical Landscape Linkages on or near this property.

**3. Pima Pineapple Cactus**

No portion of the site is designated as Priority Conservation Area (PCA) for the Pima Pineapple cactus.

**4. Needle-Spined Pineapple Cactus**

No portion of the site is designated as Priority Conservation Area (PCA) for the needle-spined pineapple cactus.

**5. Cactus Ferruginous Pygmy Owl/Western Burrowing Owl**

a. Cactus Ferruginous Pygmy Owl

The entire site is designated as part of Priority Conservation Area (PCA) #1 for the Cactus Ferruginous Pygmy Owl. No site surveys have been performed.

b. Western Burrowing Owl

No portion of the site is designated as Priority Conservation Area (PCA) for the Western Burrowing Owl.

**6. Arizona Game & Fish Special-Status Species**

An HDMS report from the Arizona Department of Game & Fish has been obtained for the subject property and is included in Appendix A of this Site Analysis. Seven (7) *Special Status Species* are listed in this report.

**7. Saguaro and Ironwood Inventory**

Saguaro Cactus (*Carnegiea gigantea*) have been field surveyed and mapped on the subject property (See Exhibit I-D.3). A total of nine hundred seventy-four (974) saguaros were found on the property. Five hundred fifty-four (554) of these saguaros are six feet (6') tall or less in height, three hundred sixty-seven (367) are greater than six feet, up to eighteen feet (>6' to 18') tall, and fifty-three (53) are greater than eighteen feet (>18') tall.

The subject property has also been field surveyed for Ironwood Trees. Six hundred fourteen (614) Ironwoods were found on the property; see Exhibit I-D.3.

**8. Open Space Acquisition Status**

The property is designated on the 2015 Proposed Conservation Bond Program as a *Secondary Priority Habitat Conservation Parcel*. The property is currently eligible for acquisition under the 2004 Conservation Bond Program. No acquisition efforts are currently underway by Pima County.

**9. Vegetation of Note for Scenic Value, Buffering, etc.**

There are significant areas on the site with vegetation of generally good quality and aesthetic value. These areas are depicted on Exhibit I-D.3. There has been some prior disturbance on the property due to unauthorized occupation and off-road vehicles.

**10. On-Site Vegetative Communities**

Vegetation on the property is in generally good condition, with some minor destructive impacts as mentioned immediately above. The following two (2) vegetative zones have been mapped on the subject site (see Exhibit I-D.3,7-10).

**Zone I: Riparian Vegetation – 403,133 SF (approximately 16.8% of the Site)**

This zone represents the most densely vegetated portion of the site. This vegetation is in generally good condition. Many of the specimens are of large size for their particular species. The predominant species within this Zone are:

- Foothills Palo Verde – *Cercidium microphyllum*
- Blue Palo Verde – *Cercidium floridum*
- Mesquite – *Prosopis velutina*
- Whitethorn Acacia – *Acacia constricta*
- Catclaw Acacia – *Acacia greggii*
- Hackberry – *Celtis palida*
- Ironwood – *Olneya tesota* (limited population)
- Saguaro -- *Carnegiea gigantea* (limited population)

**Zone II: Upland Vegetation & Ironwood/Saguaro Association - 1,944,150 SF  
(81.2% of the Site)**

The vegetation within this zone is also in generally good condition. The predominant species within the Zone are the following:

Foothills Palo Verde – *Cercidium microphyllum*

Ironwood – *Olneya tesota*

Blue Palo Verde – *Cercidium floridum*

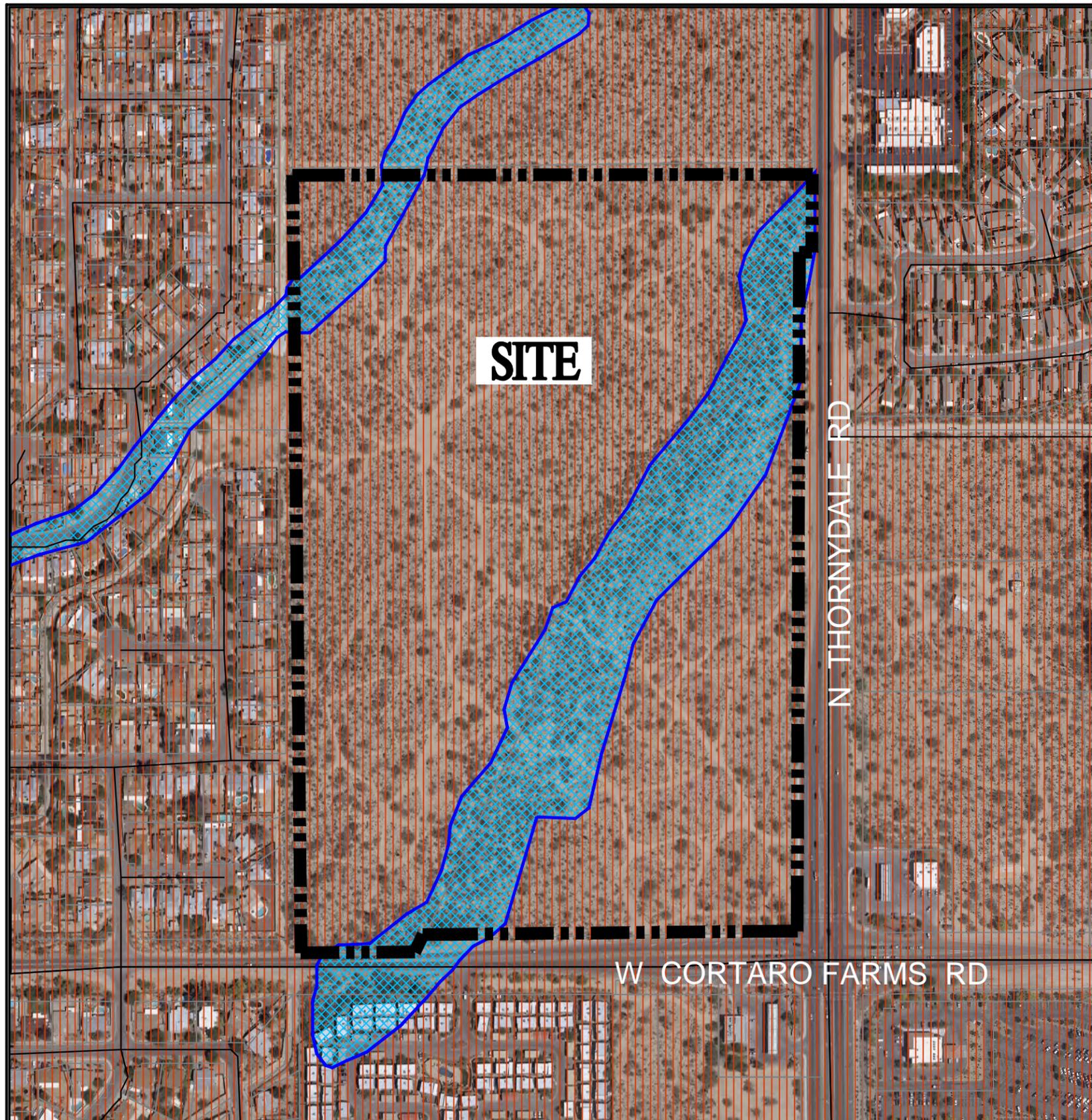
Saguaro – *Carnegiea gigantea*

Barrel Cactus – *Ferrocactus spp.*

Prickly Pear – *Opuntia spp.*

Cholla – *Opuntia spp.*

**Exhibits to Follow**



## LEGEND

 Subject Property  
 Entire site and surrounding area falls within  
 Multiple Use Management Area (MUMA) and  
 Special Species Management Area (SSMA)  
 CLS Designation.  
 (Approximately 54.9 AC)

 Multiple Use Management Area (MUMA) and  
 Special Species Management Area (SSMA) with  
 underlying Xeroriparian "C" Riparian Area  
 Approx. 10.7 AC

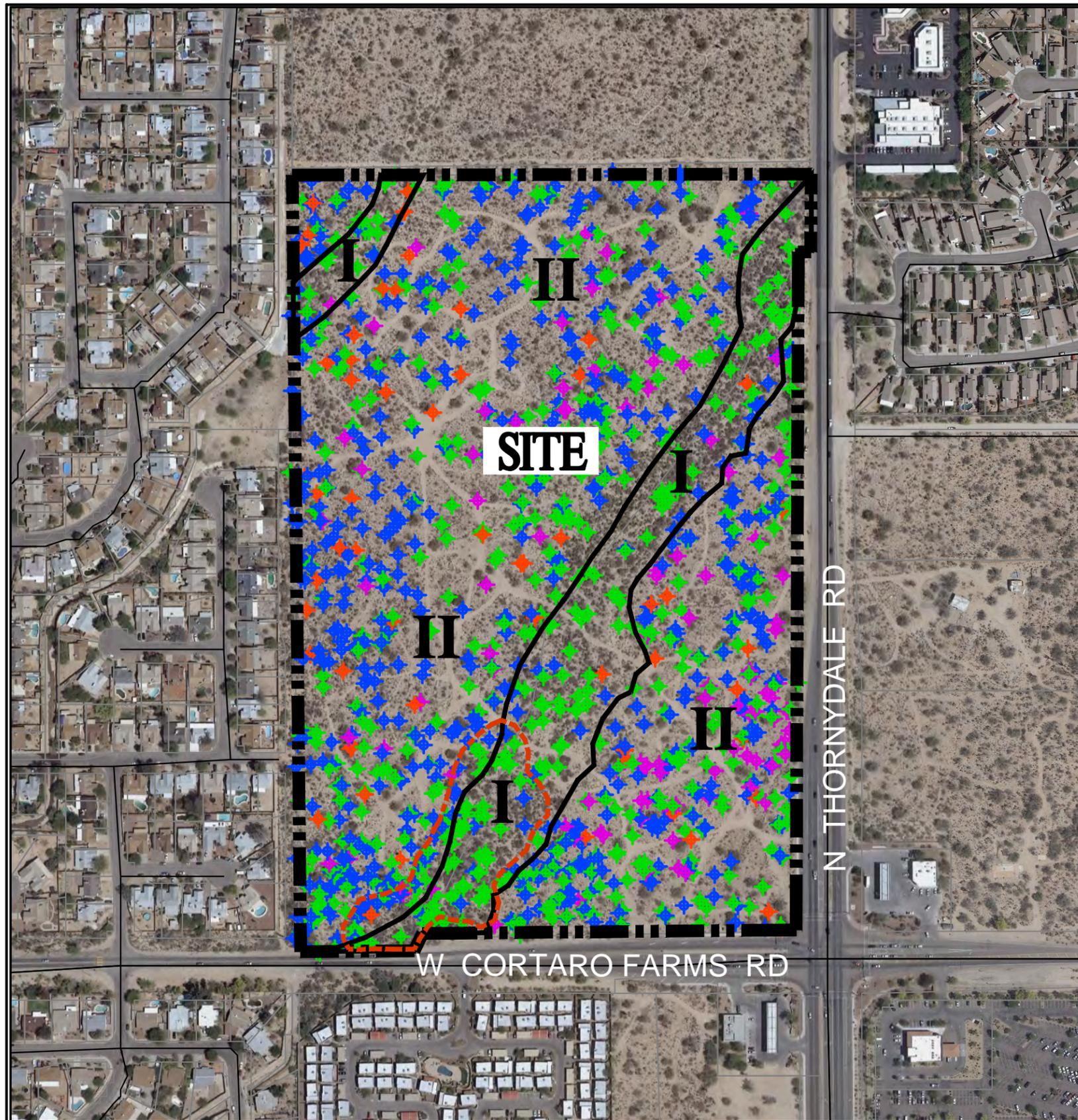
 Multiple Use Management Area (MUMA)  
 and Special Species Management Area (SSMA)  
 Approx. 44.2 AC

Entire Rezoning Site falls within  
 MUMA and SSMA CLS Designation

150 0 150 300  
 SCALE IN FEET 1"=300'



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**LEGEND**

-  Subject Property
-  Riparian Vegetation
-  Upland Vegetation with Saguaro - Ironwood - Palo Verde Association
-  Saguario ≤ 6' in height
-  Saguario >6' - 18' in height
-  Saguario >18' in height
-  Ironwood Tree
-  Vegetation of Special Note for Scenic Value or Buffering

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**EXHIBIT I-D.3,7-10**  
 VEGETATIVE COMMUNITIES  
 PAGE 21

**E. VIEWSHEDS**

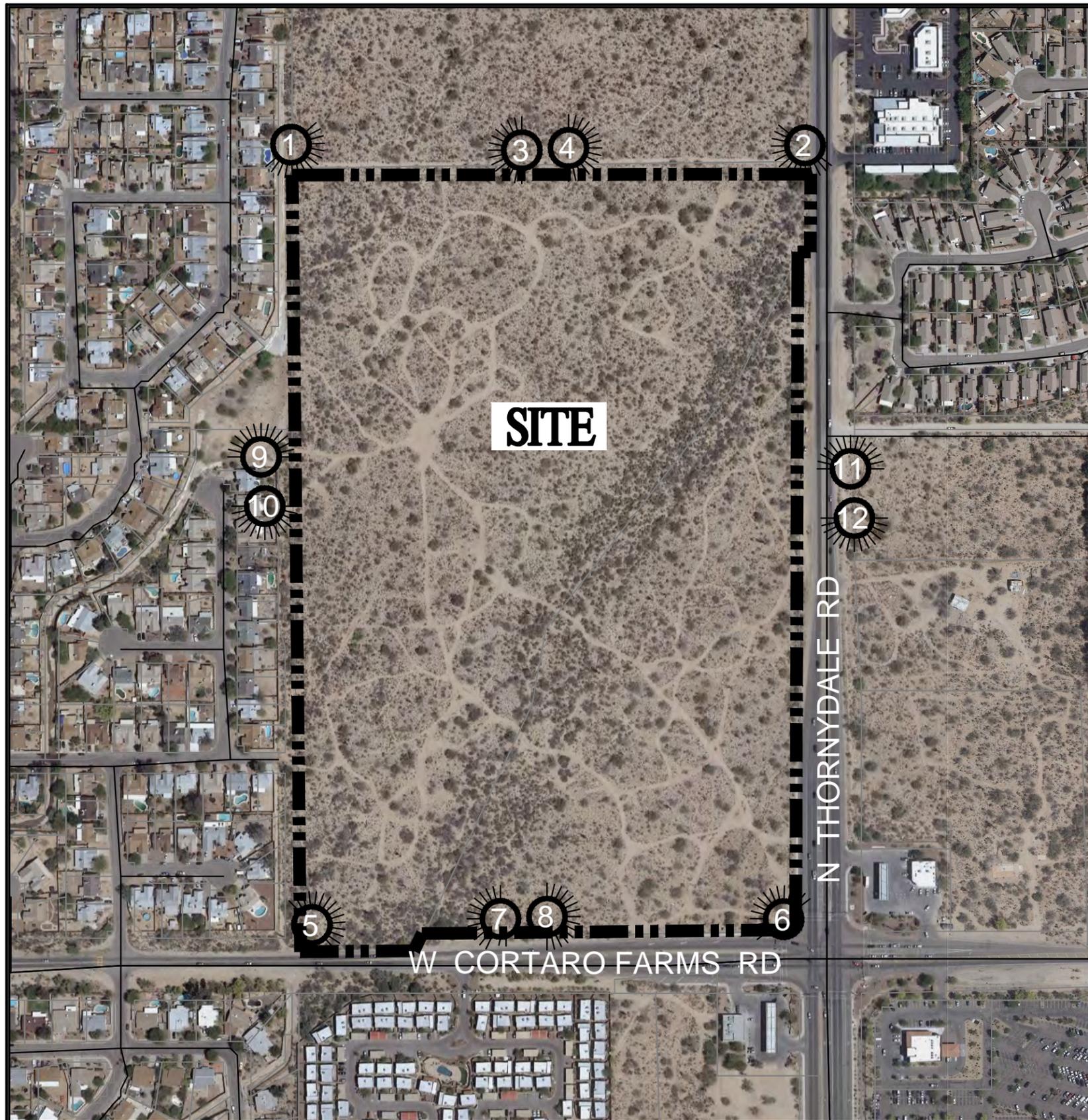
**1. Cluster Development Option**

The proposed project will not be developed under the Cluster Development. As such, no criteria are required nor provided to determine areas of high, medium and low visibility.

**2. Photographic Depiction**

Ground level photographic mosaics have been provided at pertinent boundary locations surrounding the subject property. The photo location points are depicted on Exhibit I-E.2a. The photographic mosaics are depicted on Exhibits I-E.2b through I-E.2g. In general, the views across the site are unremarkable in the foreground and mid-ground ranges. The most notable and high-quality views are northward in the direction of the distant Tortolita Mountains, westward toward the distant Tucson Mountains, eastward in the direction of the distant Santa Catalina Mountains.

**Exhibits Follow**



## LEGEND



Subject Property

### Key to Photo Locations & Orientation

1. Looking southeast.
2. Looking southwest.
3. Looking west.
4. Looking east.
5. Looking northeast.
6. Looking northwest.
7. Looking west.
8. Looking east.
9. Looking north.
10. Looking south.
11. Looking north.
12. Looking south.



Radial Lines indicate Direction and Extent of Photo View; see subsequent exhibits for pictorial survey.

150 0 150 300  
SCALE IN FEET 1"=300'



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EXHIBIT I-E.2a  
EXISTING VIEWSHEDS  
AND PHOTO LOCATIONS  
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PHOTO LOCATION 1: View from northwest corner of the project, looking southeast at the property.



PHOTO LOCATION 2: View from northeast corner of the project, looking southwest at the property.

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PHOTO LOCATION 3: View from north midpoint of the project, looking west.



PHOTO LOCATION 4: View from north midpoint of the project, looking east.

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PHOTO LOCATION 5: View from southwest corner of the project, looking northeast at the property.



PHOTO LOCATION 6: View from southeast corner of the project, looking northwest at the property.

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PHOTO LOCATION 7: View from south midpoint of the project, looking west.



PHOTO LOCATION 8: View from south midpoint of the project, looking east.

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PHOTO LOCATION 9: View from west midpoint of the project, looking north.



PHOTO LOCATION 10: View from west midpoint of the project, looking south.

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**EXHIBIT I-E.2f**  
 EXISTING VIEWSHEDS

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PHOTO LOCATION 11: View from east midpoint of the project, looking north.



PHOTO LOCATION 12: View from east midpoint of the project, looking south.

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## **F. TRANSPORTATION**

The subject property is located at the immediate northwest corner of Thornydale Road at Cortaro Farms Road, which is a signalized intersection. Both of these roadways are paved public streets that are designated “major streets” (medium volume arterials) and “scenic routes” on the *Pima County Major Streets & Scenic Routes Plan (MSSRP)* per its May 19, 2015 update.

Complete four-lane divided improvements (curbs, sidewalks, medians, bike lanes, landscaping) are in place on Cortaro Farms Road east of Thornydale Road. The same full improvements are in place on Thornydale Road south of Cortaro Farms Road. The latter transitions to two-lane, uncurbed cross-section (no curbs, no sidewalks, no bike lanes) west of Thornydale Road, while Thornydale transitions to a three-lane section (continuous center left-turn lane, no curbs, no sidewalks, no bike lanes) north Cortaro Farms Road. Please refer to Exhibit I-F.1a-e (Transportation-Access) for a graphic depiction of the above particulars.

### **1. Existing & Proposed Off-Site Streets**

#### **a. Existing Rights-of-Way**

The full one hundred fifty foot (150') right-of-way (75' half rights-of-way) are already in place for both Thornydale Road and Cortaro Farms Road along nearly all of the subject property frontage.

#### **b. Compliance with Pima County Width Standards**

The aforementioned 150' rights-of-way for Thornydale Road and Cortaro Farms Road are in compliance with MS&R requirements. Small dedications may be required at the extreme north end of the site (on Thornydale Road) and at the extreme west end of the site (on Cortaro Farms Road), respectively.

#### **c. Right-of-Way Uniformity/Continuity**

The current rights-of-way are generally uniform and the physical roadway improvements are centered within them.

#### **d. Rights-of-Way for Proposed Off-Site Roadways**

No new off-site roadways are proposed with this project. On-site improvements will be limited to private drives, service lanes, and parking improvements, as will be depicted on the *Preliminary Development Plan (PDP)* presented in Section II (Land Use Proposal).