

**SIPHON DRAW  
DRAINAGE IMPROVEMENTS PROJECT**

**Level 1 Scenery and Recreation Resources  
Assessment Summary Report**

**Flood Control District of Maricopa County**  
Landscape Architecture Branch  
2801 West Durango Street  
Phoenix, Arizona 85009-6399



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Assessment Summary Report**

**September 24, 2007**

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# 1. Project Background

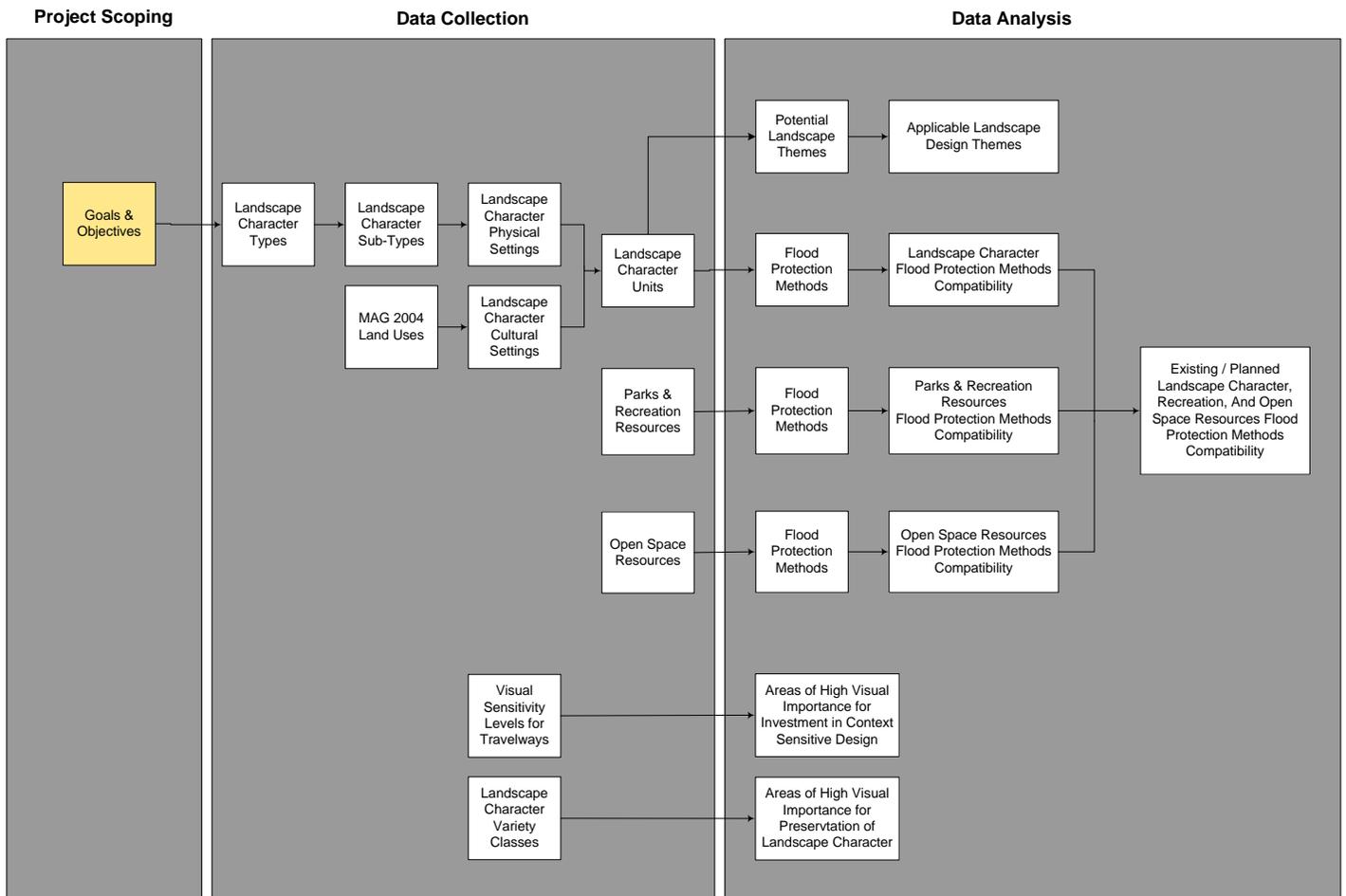
## 1.1 Project Overview

## 1.2 Siphon Draw Study Area

## 1.3 Goals and Objectives

## 1.4 Purpose

## 1.5 Methodology



## 1.1 Project Overview

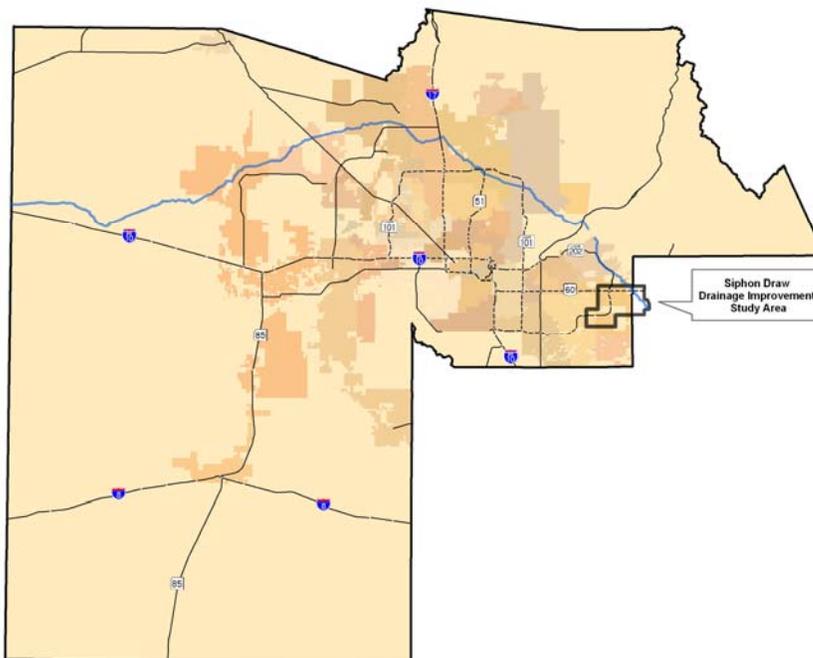
The Siphon Draw Drainage Improvements Project is a multi-purpose flood control project that is a partnership between the Flood Control District of Maricopa County (District) and the City of Mesa. The purpose of the project is to capture the 100-year flood from the Central Arizona Project (CAP) over chutes, upstream watershed, and some of the Siphon Draw Wash flows, future development and approximately a 3-square mile area bounded by Meridian Road, Elliot Road (Pinal County) and the CAP. The primary goal of the Project is to intercept flood water at Meridian Road, to protect properties to the west of Meridian Road and to detain the floodwater such that the Project outlet capacity of 500 cfs is not exceeded in order to provide future 100 year flood protection. Land subsidence is a known issue within the study area. An analysis and mitigation measure that address this issue will be fully integrated into the final design for the project.

Landscape architectural design concepts will be integrated into the design of the structural components of the flood control solutions to enable the project to become context sensitive with the character of the surrounding natural Sonoran Desert landscape and to help protect the character of the local communities within the project area. Opportunities for future recreation trails and other multi-use facilities may be incorporated into the design of the storm water conveyance channels and within the storage basin(s).

## 1.2 Siphon Draw Study Area

The Siphon Draw Study Area encompasses an area of 48 square miles, or 30,566 acres and is located on the border of Maricopa County and Pinal County. Approximately 78% of the Study Area is situated within the City of Mesa in Maricopa County. The remaining 22 percent is located within the City of Apache Junction in Pinal County (Figure 1-1). Prominent physical features in the Siphon Draw Study Area are referenced in Figure 1-2. They include the CAP canal, Siphon Draw Wash that extends from the CAP over chutes from east to west, General Motors Proving Ground, Williams Gateway Airport, U.S. Highway 60 (US 60) and the Loop 202 freeway.

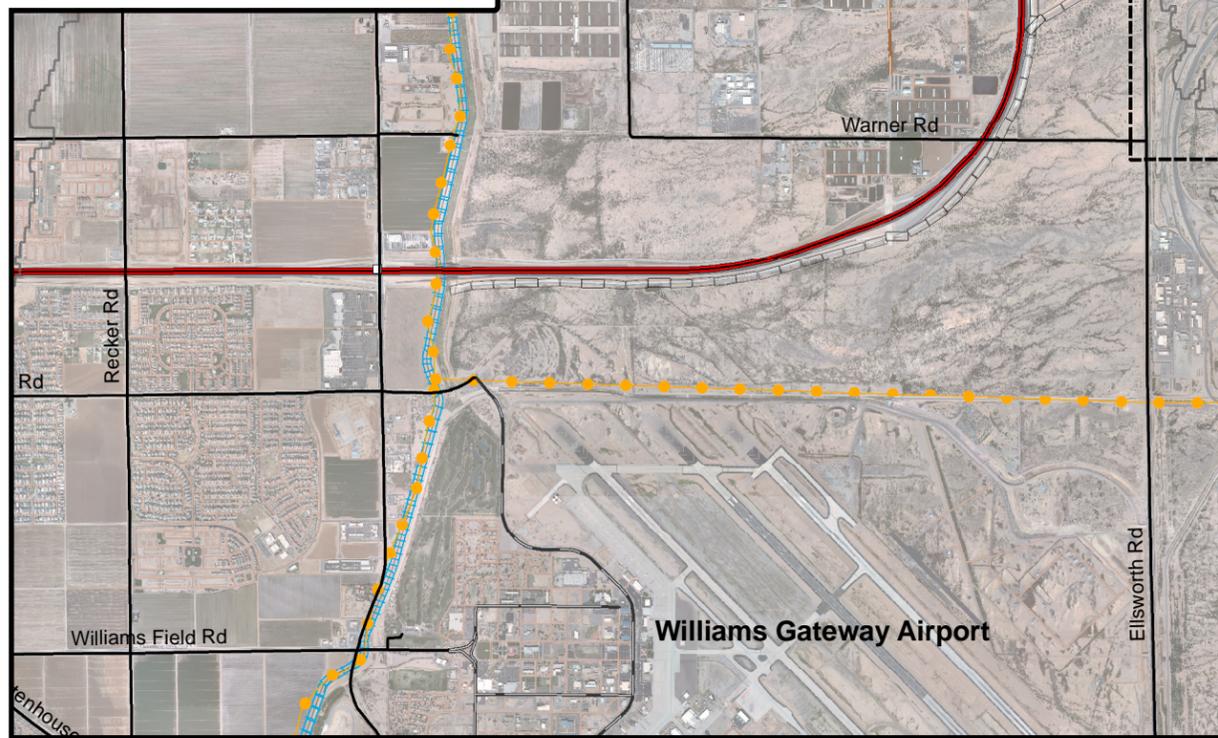
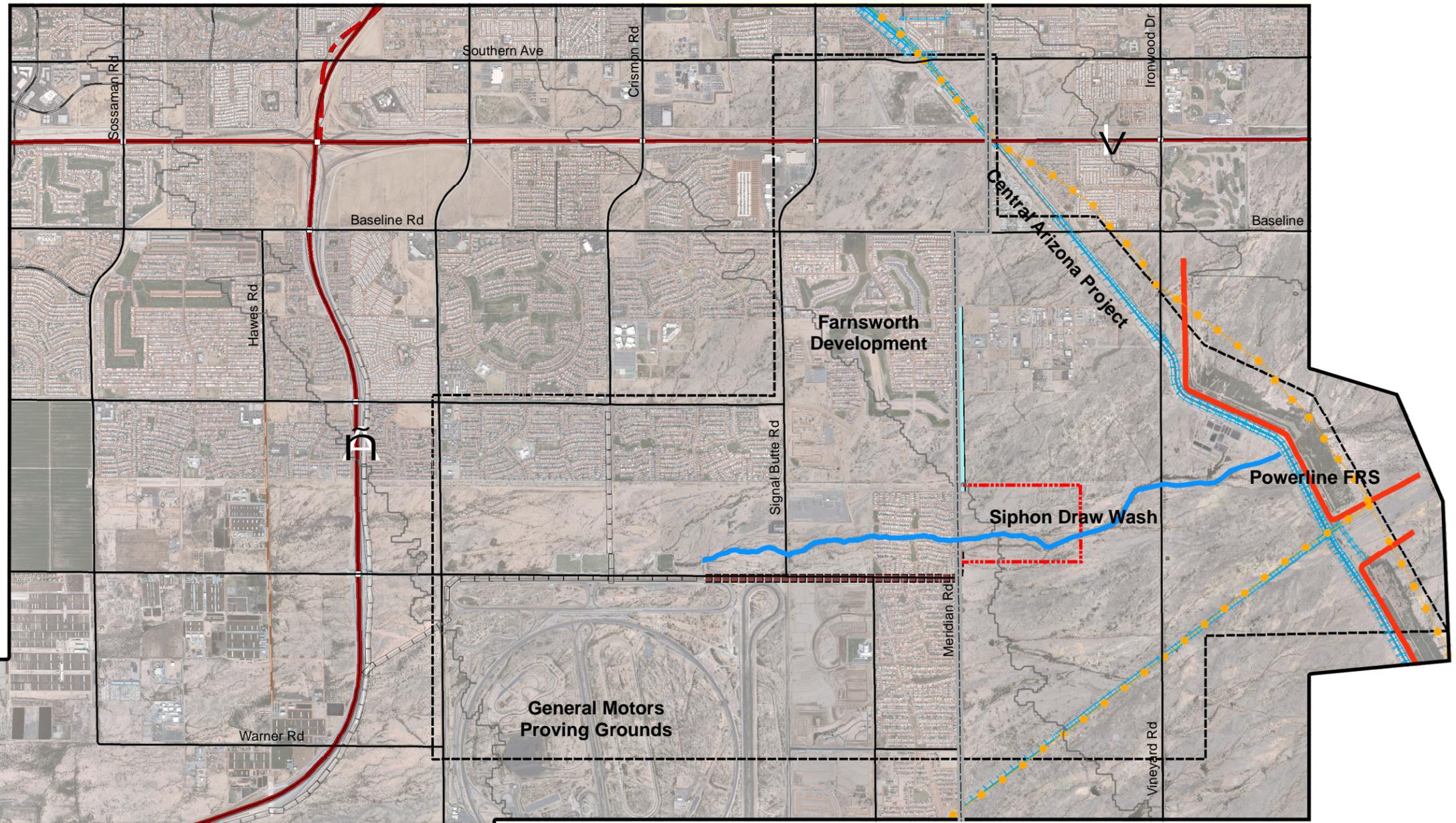
**Figure 1-1 Project Location Map**



**PROMINENT FEATURES**

**Project Components**

-  Basin Site
-  Existing Channel / Storm Drain
-  Open Channel
-  Proposed Storm Drain





## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

 Study Area	 Freeways	 100 Foot Contours
 Project Boundary	 Arterials	 Maricopa Trails
 County Boundary	 Dam	 Canals

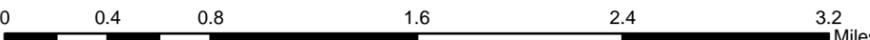




Figure 1-2

### 1.3 Goals & Objectives

Flood Control District goals and performance objectives for scenery, recreation and open space resources for the Siphon Draw Drainage Improvements Project derive from the District's Mission and Vision statements and the District's Board approved *Policy for the Aesthetic Treatment and Landscaping of Flood Control Projects*. The goals and objectives listed below are intended to be used as criteria for the planning, design and evaluation of the performance of the alternatives and final design for the structural components of the project. Additional goals and objectives pertaining to scenery, recreation and open space resources may be provided by the Cities of Mesa, Apache Junction, other project stakeholders and local citizens as a part of the design process for the project. The data collection and analysis of scenery, recreation and open space resources contained in this assessment has been designed to respond directly to the project objectives listed below.

#### **Flood Control District Mission**

The mission of the Flood Control District of Maricopa County is to provide regional flood hazard identification, regulation, remediation, and education to Maricopa County residents so that they can reduce their risks of injury, death, and property damage from flooding, while still enjoying the natural and beneficial values served by floodplains.

#### **Flood Control District Vision**

The District's vision is for the residents of Maricopa County and future generations to have the maximum level of protection from the effects of flooding through fiscally responsible flood control actions and multi-use facilities that complement and enhance the beauty of our desert environment.

#### **Scenery Resources Project Goals and Objectives**

The District's Goal for the landscaping and aesthetic treatment of flood control projects is to preserve the visual beauty and other aesthetic qualities of the urban, rural and natural settings in Maricopa County (eg Context Sensitive) as an integral part of the planning and design of flood control facilities. Project objectives related to the achievement of this goal include:

- Preserve and complement the visual character of natural, rural, suburban and urban landscape settings of Maricopa County
- Retain and preserve distinctive natural and cultural landscape features and areas
- Maintain and enhance the traditional views of the Sonoran Desert, including opportunities for public viewing of mountains, uplands, washes and other scenic landscape features of Maricopa County
- Utilize flood control projects to improve and restore landscapes with visual disturbances to a condition that is complementary to the valued character of the surrounding landscape

#### **Recreation Resources Project Goals and Objectives**

The District's recreation goal is to promote recreation multiple-uses of its properties and partnerships with the Parks and Recreation Department of Maricopa County and local communities, to assist in meeting public needs for parks and recreation in Maricopa County, to the extent that such uses do not compromise the flood control function, operation and maintenance of those facilities. Project objectives related to the achievement of this goal include planning and designing flood control solutions to:

- Preserve and complement the desired character and recreation experience of existing parks and recreation areas within Maricopa County

- Maximize opportunities to meet regional and local community needs for passive and active recreation uses
- Maximize opportunities to implement the Maricopa Regional Trail Master Plan and meet local community needs for trails

### **Open Space Resources**

The District's open space goal is to promote the uses of its properties to assist in meeting public and local community needs for open space preservation in Maricopa County. Project objectives related to the achievement of this goal include planning and designing flood control solutions to:

- Achieve consistency with, and assist in, the implementation of the Maricopa Association of Governments' Desert Spaces Plan.
- Achieve consistency with the goals and objectives of local community general plan open space elements.

### **1.4 Purpose of the Scenery and Recreation & Open Space Resource Assessment**

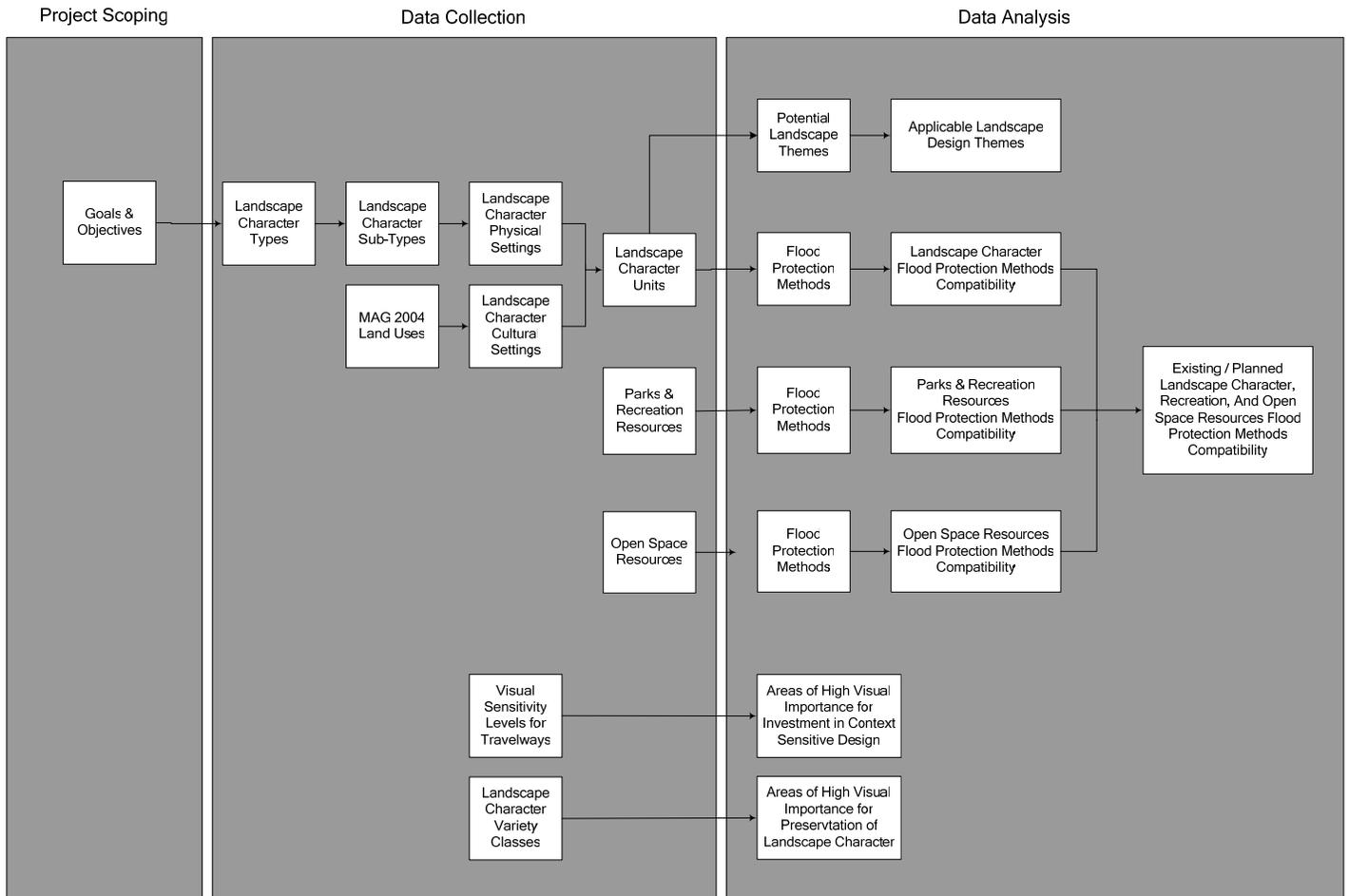
The planning and design of flood control facilities to preserve, enhance and complement the beauty of the natural landscapes and character of local communities within Maricopa County is a primary objective of the District's Board approved Policy for the Aesthetic Treatment and Landscaping of Flood Control Projects. Scenery & Recreation Resource Assessments are undertaken by the District to help guide in the planning and design of facilities to achieve context sensitivity with the surroundings in which they are located.

The purpose of this study is to provide a preliminary assessment that 1) identifies, describes and documents the scenery, recreation and open space resources of the study area; 2) assesses the compatibility of these resources with a variety of possible flood protection methods that may be implemented in the project alternatives; and 3) identifies Landscape Design Themes that that will enable project flood protection solutions to become context sensitive with the visual and recreation environments of the study area.

## 1.5 Methodology

The approach and methodology utilized in this assessment is illustrated in Figure 1-3. The process began with the identification of the scenery, recreation and open space goals and objectives for the project. The second phase involved collection of data needed to achieve the goals and objectives. The District's Countywide GIS Landscape Inventory and Analysis (LIA) was utilized to obtain data pertaining to landscape character, visual sensitivity, scenic quality, existing recreation and open space. The data from the LIA was reviewed, field verified and refined by the Flood Control District of Maricopa County Landscape Architecture Branch for the project study area. Additional mapping was undertaken as a part of this effort to provide coverage for the portion of the study area situated within Pinal County. The third phase of the assessment involved the use of Flood Protection Methods Compatibility Class Maps from the LIA and the District's *Flood Protection Methods Handbook* to identify the types of flood protection methods that are expected to be context sensitive with the visual and recreation environments of the study area. Lastly, the direction and tools contained in the District's *Landscape Design Themes Handbook* were utilized to identify a range of landscape design themes that could be applied to project structural components to achieve context sensitivity with the environments of the study area.

**Figure 1-3 Assessment Process Diagram**

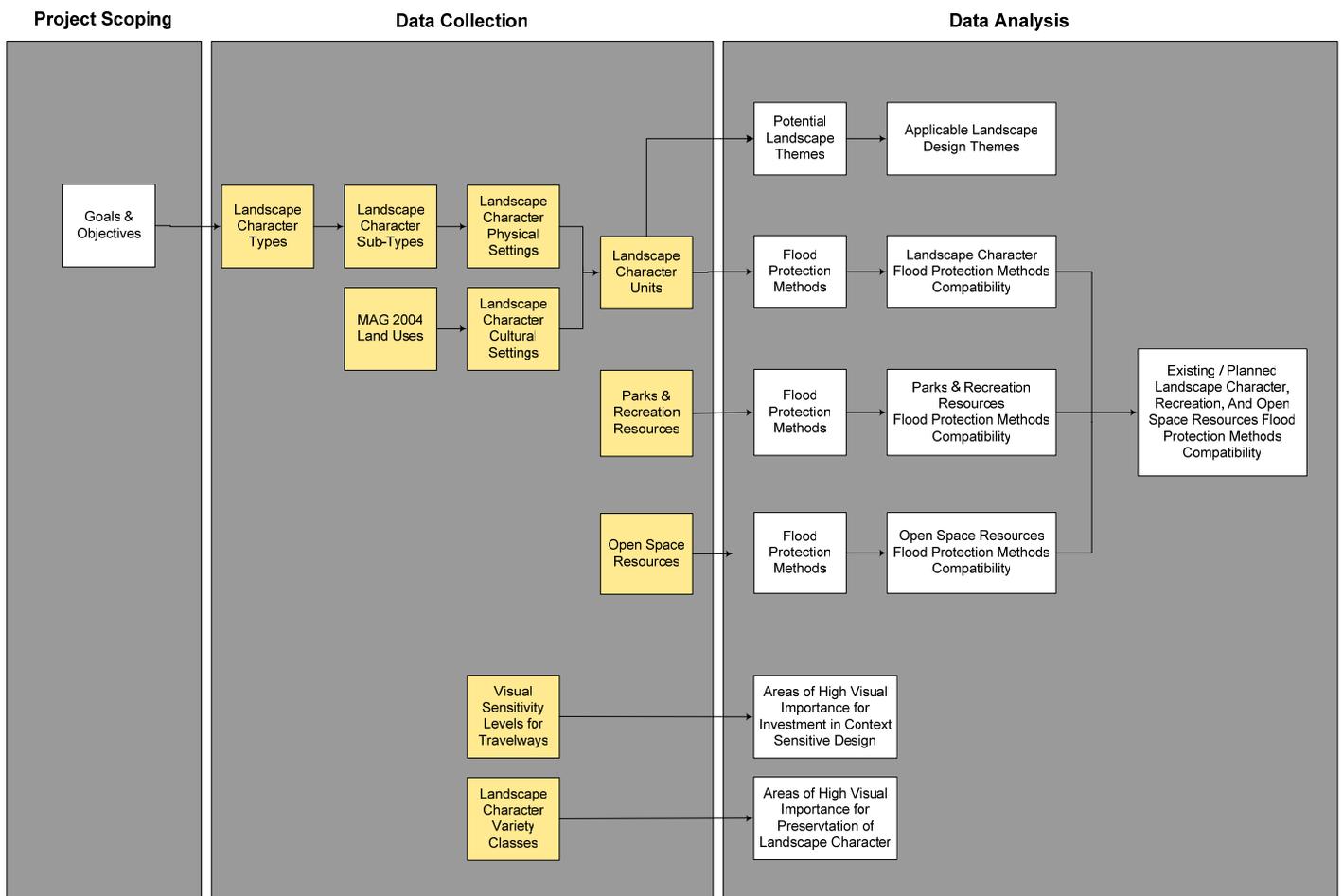


# 2. Data Collection

## 2.1 Scenery Resources

## 2.2 Recreation Resources

## 2.3 Open Space Resources



## 2.1 SCENERY RESOURCES

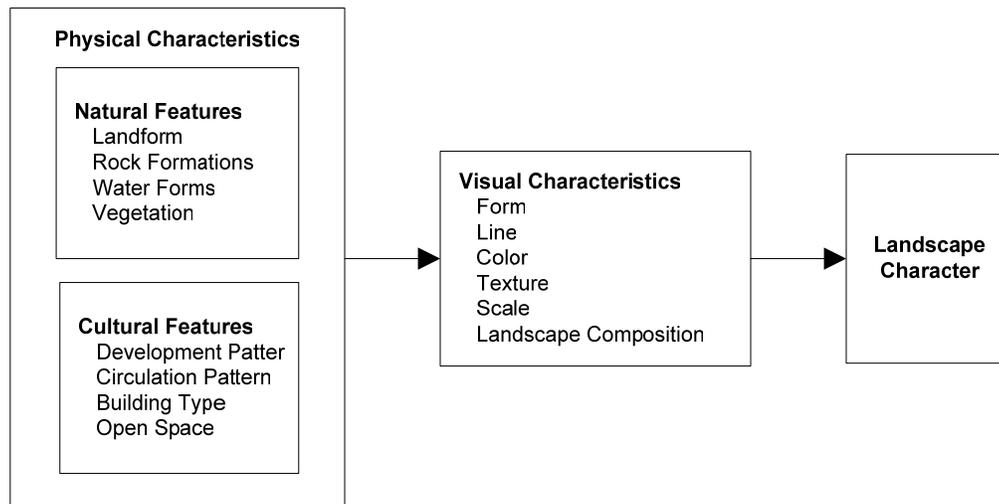
The Scenery Resource Assessment includes inventories and analyses of Landscape Character, Visual Sensitivity and Scenic Quality. It also includes assessments of the relative compatibility of these scenic resources with a variety of flood protection methods that are routinely applied by the District in delivering flood protection services and facilities to the citizens of Maricopa County.

### 2.1.1 Landscape Character

Landscape character is defined as “the physical appearance and cultural context of a landscape that gives it an identity and “sense of place.” The District’s method for evaluating landscape character was adapted from a commonly recognized tiered system used by USDA Forest Service (USDAFS) visual resource managers and assessors to classify the visual character of National Forest landscapes.

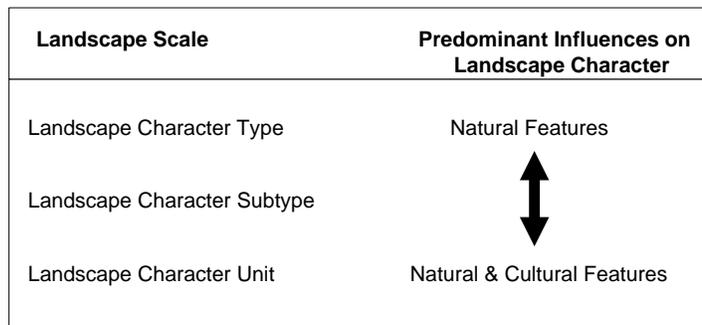
The approach taken in the Landscape Character Assessment considers the influences of both the natural and cultural environments on landscape character. A conceptual model of the Landscape Character Assessment is illustrated in (Figure 2-1). The assessment began with an examination of the physical characteristics of the natural and cultural features that comprise the landscapes of Maricopa County. The predominant visual characteristics of the landscape, including the design elements of form, line, color and texture, along with scale and landscape composition, were then derived from the physical characteristics of the natural and cultural features.

**Figure 2-1 Landscape Character Assessment Conceptual Model**



To implement this approach, the District has established a system for identifying, describing and delineating landscape character within Maricopa County at three different scales. This land classification system builds upon, and extends, the system for identifying and mapping Landscape Character Types and Subtypes established by the USDA Forest Service as a part of their National Forest Visual Resources Management System. The landscape character classification system is hierarchical. Each landscape scale is subdivided into smaller parts by the one directly below it. The landscape character delineations at each scale represent areas of land having common distinguishing physical and visual characteristics. The potential influence of the natural and cultural features on landscape character varies with the scale of the landscape and their prominence therein. The three landscape scales and the predominant natural and cultural influences on their character are represented in Figure 2-2.

**Figure 2-2 Landscape Scale**



**Landscape Character Type**

The Landscape Character Type is a regional area of land having common distinguishing physical and visual characteristics. It represents the broadest and largest scale of landscape character delineation. Character Types are delineated based upon the physical and visual characteristics of their natural features, with landform character exerting a primary influence. Cultural features do not influence the delineation of the boundaries of the Character Types. The Sonoran Desert and Tonto are examples of Landscape Character Types that occur in Maricopa and Pinal Counties.

**Landscape Character Subtype**

The Landscape Character Subtype is a sub-regional area of land of substantial size having common distinguishing physical and visual characteristics. Subtypes are divisions of the Character Types that have significantly different visual characteristics from one another. The Subtypes are delineated based on the physical and visual characteristics of their natural features, with landform, water form and vegetation pattern providing the primary influences. As with the Character Types, cultural features do not influence the delineation of the Character Subtypes. The Sonoran Desert Character Type includes the Sonoran River Lands, Sonoran Valley Lands and the Sonoran Mountain Lands.

**Landscape Character Unit**

The Landscape Character Unit is a local area of considerable size with common distinguishing physical and visual attributes. Both natural and cultural features influence the delineation of landscape character units through a three step process. This process included: 1) subdividing the Landscape Character Subtypes into Physical Settings; 2) identifying and delineating Cultural Landscape Character Settings from MAG GIS land use data; and 3) overlaying the physical and cultural settings maps to derive the Landscape Character Units. Forty-nine Landscape Character Units have been identified in Maricopa County through

application of this process. Appendix C contains a Key to the Landscape Character Units of Maricopa County. Appendix D contains a map displaying the Landscape Character Units of Maricopa County.

### 2.1.1.1 Regional Landscape Character Setting of the Study Area

The landscape character types and subtypes define the regional context for the visual character of the landscapes found within the project study area.

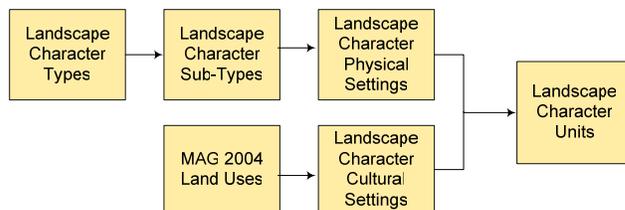
The Siphon Draw Drainage Improvement project study area is situated entirely within the Sonoran Desert landscape character type. This character type is typified by broad desert valleys and basins demarcated by a variety of northeast trending mountain ranges and foothills, drained by a number of large rivers and dry washes. The Sonoran Desert is unique among the major deserts of Southwestern United States in that it is a “green” desert that is internationally recognized for its diversity of vegetative plant species. The Saguaro cactus is the signature vegetative specie that is unique to the Sonoran Desert. Overall, this character type is typified by open panoramic views across desert valleys with arresting angular mountain blocks forming the scenic backdrop.

The Sonoran Desert Landscape Character Type is comprised of three landscape character subtypes, which include the Sonoran Mountain Lands, Sonoran Valley Lands, and Sonoran River Lands. The project area is situated entirely within the Sonoran Valley Lands Landscape Character Subtype. This subtype comprises the valley floors of the Sonoran Desert. It is characterized by relatively flat lands that are typically sparsely vegetated with creosote and bursage and are dissected by u-shaped washes that are demarcated by mesquite bosques.

### 2.1.1.2 Landscape Character of the Project Area

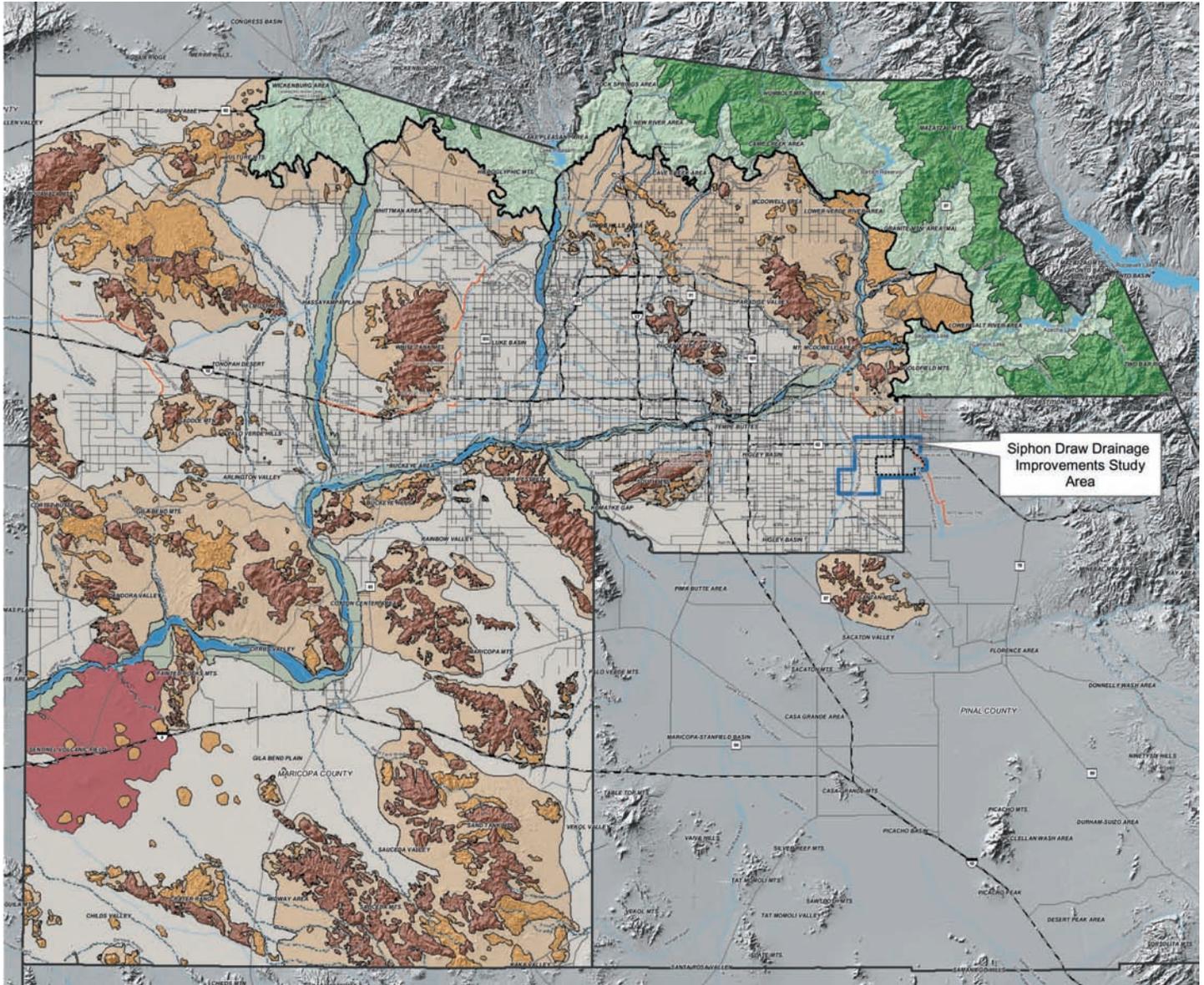
Landscape character at the project scale is defined by the landscape character unit. The Landscape Character Units found within the project study area were identified and delineated through a three step process illustrated in Figure 2-3.

**Figure 2-3 Landscape Character Assessment Process**



The first step involved subdividing the Landscape Character Subtypes into Landscape Character Physical Settings. Ten different Landscape Character Physical Settings have been identified within Maricopa County by the District in its countywide LIA as illustrated in Figure 2-4. The Sonoran Valley Lands Subtype contains two physical settings: the Valley Wash and Valley Plains (Figure 2-5). Approximately 97 percent of the Siphon Draw project study area is comprised of the Valley Plains Physical Setting. The remainder is made up of the Valley Wash Setting. These washes and their associated riparian vegetation were delineated as part of this study using aerial photography and field investigation.

**Figure 2-4 Landscape Character Types, Subtypes and Physical Settings of Maricopa County**



**Sonoran Desert Character Type**

- |                                    |                                     |                                       |                |
|------------------------------------|-------------------------------------|---------------------------------------|----------------|
| <b>Sonoran River Lands Subtype</b> | <b>Sonoran Valley Lands Subtype</b> | <b>Sonoran Mountain Lands Subtype</b> |                |
| River Channel                      | Valley Rivers & Washes              | Arroyo                                | Mountains      |
| River Terrace                      | Valley Plains                       | Bajada                                | Volcanic Field |
|                                    |                                     | Foothills                             |                |

**Tonto Character Type**

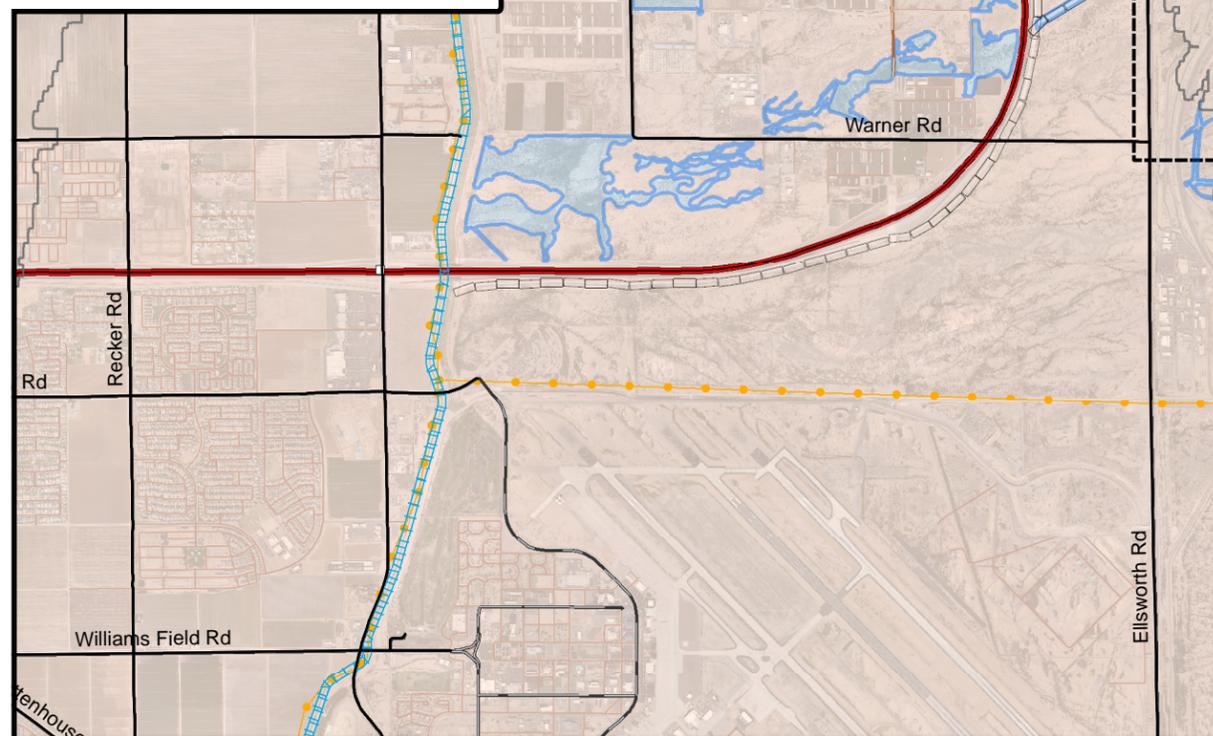
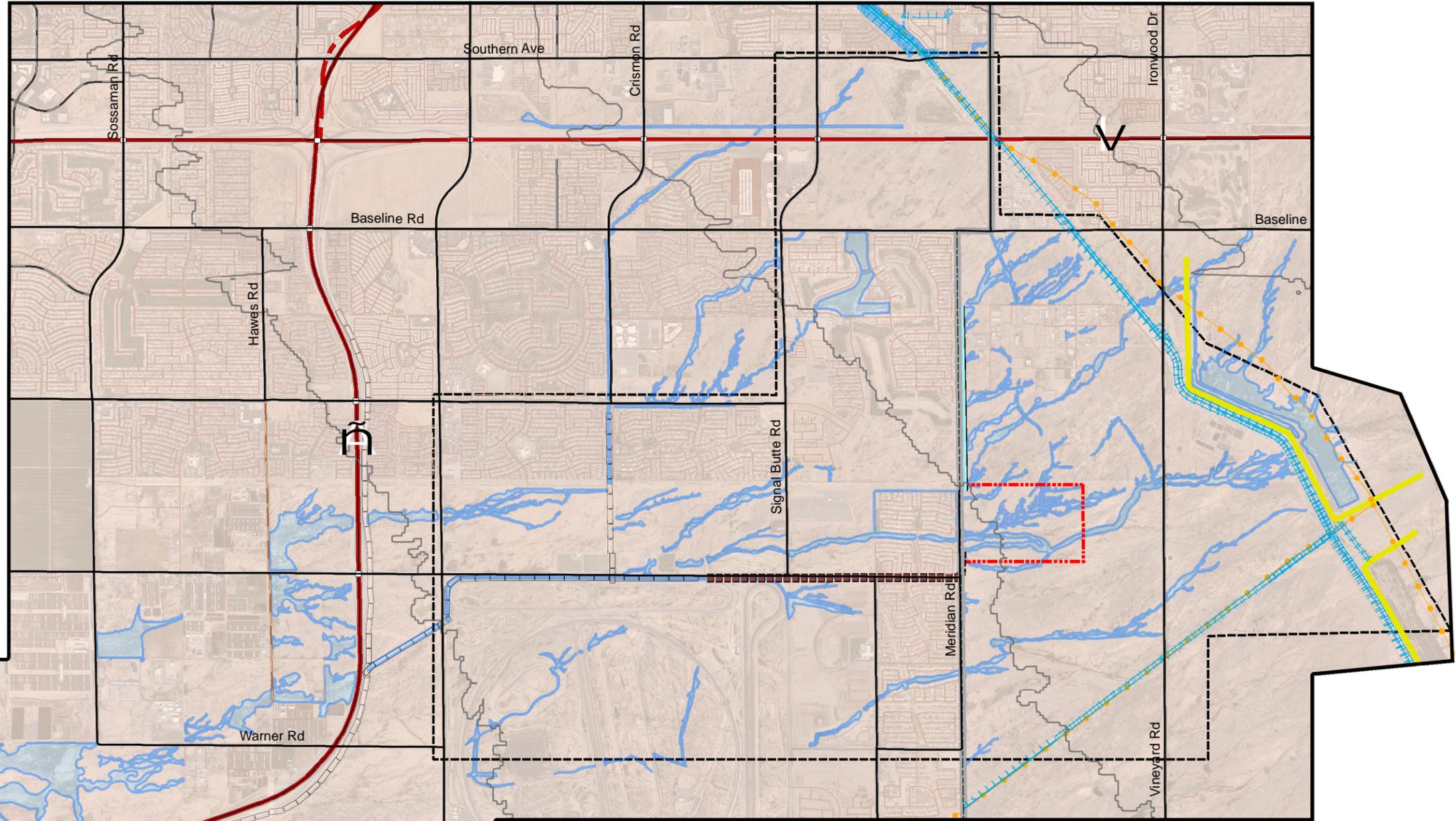
- |                                 |
|---------------------------------|
| Sonoran Arizona Uplands Subtype |
| Upper Tonto Subtype             |
- \*Note: The physical units within the Tonto Character Type have not been delineated beyond the subtype level.*

**LANDSCAPE CHARACTER  
PHYSICAL SETTINGS**

- Valley Plain
- Valley Wash

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



**Siphon Draw Drainage Improvements Project**

**REFERENCE FEATURES**

<span style="display: inline-block; border-bottom: 2px solid black; width: 20px; margin-right: 5px;"></span> Study Boundary	<span style="display: inline-block; border-bottom: 2px solid red; width: 20px; margin-right: 5px;"></span> Freeways	<span style="display: inline-block; border-bottom: 1px solid gray; width: 20px; margin-right: 5px;"></span> 100 Foot Contours
<span style="display: inline-block; border-bottom: 2px dashed black; width: 20px; margin-right: 5px;"></span> Project Boundary	<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> Arterials	<span style="display: inline-block; border-bottom: 2px dashed orange; width: 20px; margin-right: 5px;"></span> Maricopa Trails
<span style="display: inline-block; border-bottom: 2px dashed gray; width: 20px; margin-right: 5px;"></span> County Boundary	<span style="display: inline-block; border-bottom: 2px solid yellow; width: 20px; margin-right: 5px;"></span> Dam	<span style="display: inline-block; border-bottom: 2px dashed cyan; width: 20px; margin-right: 5px;"></span> Canals

0    0.35    0.7    1.4    2.1    2.8 Miles

Figure 2-5

The second step involved the identification and delineation of Landscape Character Cultural Settings through interpretation and reclassification of MAG land use GIS data. Five landscape character cultural settings are identified within Maricopa County in the District's countywide LIA. They include the Natural, Rural, Suburban, Urban and Industrial Landscape Character Cultural Settings. All five of these settings are represented within the Siphon Draw Project study area. The natural and suburban settings currently comprise approximately 68% of the project area. Table 1 summarizes the make up of the Existing Cultural Settings within the project study area

**Table 1 Landscape Character Cultural Settings within Siphon Draw Project Study Area**

<b>Landscape Character Cultural Setting</b>	<b>% of Acres</b>
Natural Setting	35
Rural Setting	13
Suburban Setting	33
Urban Setting	3
Industrial Setting	16
<b>Total</b>	<b>100</b>

The third step in the process involved combining the Physical and Cultural Settings to produce the Landscape Character Units. There are a total of 49 Existing Landscape Character Units represented in Maricopa County in the District's LIA.

**2.1.1.3 Existing Landscape Character Units within the Siphon Draw Project Study Area**

Nine Landscape Character Units are represented within the Siphon Draw project study area. Table 2 contains a summary listing of these landscape units and their acreage composition. Approximately 95 percent of the study is comprised of four Landscape Character Units. They include the Natural Valley Plains Unit, Suburban Valley Plains Unit, Industrial Valley Plains Unit and the Rural Valley Plains Unit. The map in Figure 2-6 shows the distribution of the Existing Landscape Character Units within the Siphon Draw project study area.

**Table 2 Landscape Character Units within Siphon Draw Project Study Area**

<b>Landscape Character Unit</b>	<b>Acres</b>	<b>% of Acres</b>
▪ Natural Valley Plains	10,635	35
▪ Suburban Valley Plains	9,807	32
▪ Industrial Valley Plains	4,848	16
▪ Rural Valley Plains	3,816	12
▪ Natural Valley Wash	771	3
▪ Urban Valley Plains	539	2
▪ Suburban Valley Wash	64	>1
▪ Rural Valley Wash	31	>1
▪ Industrial Valley Wash	51	>1
<b>Total</b>	<b>30,566</b>	

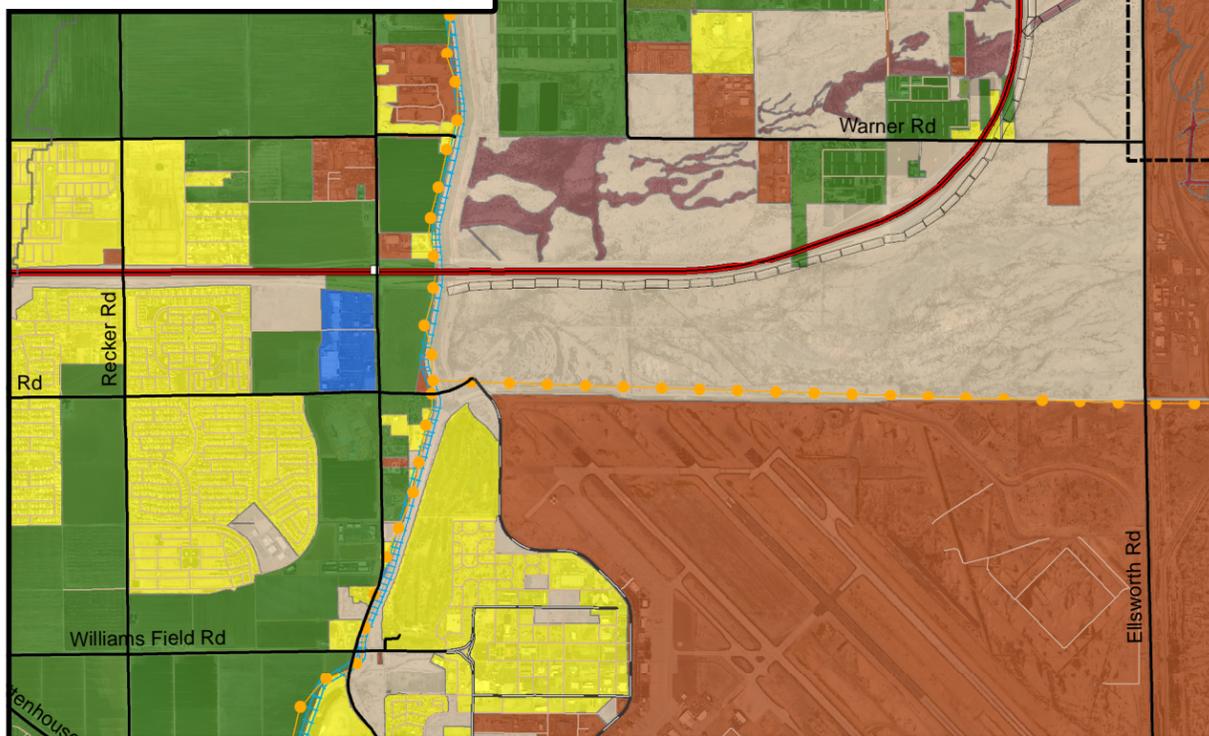
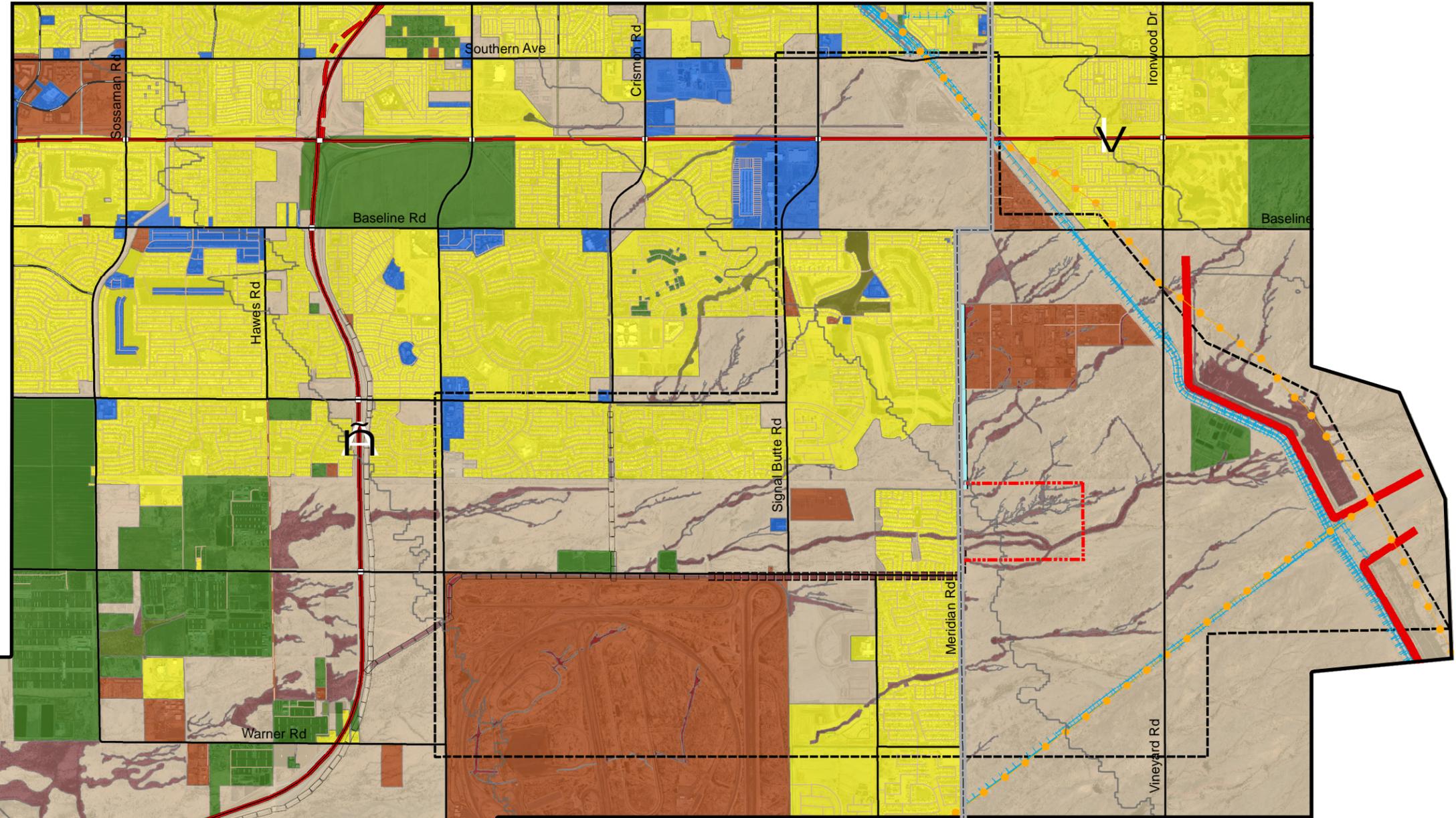
Brief descriptions and photo examples of the Landscape Character Units that are found within the project study area are provided on the following pages. Detailed descriptions that have been excerpted from the document titled *Preliminary Landscape Character Assessment for Maricopa County* may be found in Appendix E.

### EXISTING LANDSCAPE CHARACTER UNITS

- Industrial Valley Plain
- Industrial Valley Wash
- Natural Valley Plain
- Natural Valley Wash
- Rural Valley Plain
- Rural Valley Wash
- Suburban Valley Plain
- Suburban Valley Wash
- Urban Valley Plain

### Project Components

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

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Figure 2-6

## **Natural Valley Plains Unit**



The Natural Valley Plains landscape character unit within the Siphon Draw study area is comprised of flat to gently sloping landforms that are typically sparsely covered with Creosote and/or Bursage scrub species. Cultural modifications within these units are typically absent except for off road vehicle use disturbances and illegal dumping in some areas.

The predominant visual characteristics of the Natural Plains landscape unit is the horizontal form of the flat plain of the valley floor and the horizontal line formed at the boundary of the plain with the sky and the uplands. The predominant colors are the olive green color of the Creosote scrub and muted gray green color of the Bursage combined with the typically light golden tan colors of the exposed soils. The wide spacing of scrub and exposed soils combine to create a coarse texture. The extent and arrangement of the visual elements of this unit typically form large scale Panoramic Landscape Compositions in which the position of the observer is inferior and the predominant emphasis is upon horizontal line that is perpendicular to most lines of sight.

## **Rural Valley Plains Unit**



The Rural Valley Plains landscape character unit within the Siphon Draw study area primarily consists of agricultural croplands and dairy land developments on the valley floor. The landforms of the croplands are typically graded flat and typically contain dense plantings of a variety low row crops rows. The dairy lands typically consist of a variety of large structural forms that stand out as a feature that interrupts the horizontality of the valley plain. The dairy lands settings typically have little, if any, vegetative cover. Linear two lane country roads are typical.

The predominant visual characteristic of the cropland settings is the parallel lines formed by the crop rows that contrast with the horizontality of the skyline and serve to direct and focus viewer attention upon the skyline and adjacent mountain features. Another predominant visual characteristic of these settings is the lush medium green and fine texture of the densely planted rows crops. The position of the observer is inferior and the elements of the setting combine to produce a predominantly large scale Panoramic-Focal Landscape Composition.

The predominant visual characteristics of the dairy lands setting is the rectangular form and angular roof lines of barns and shade structures. The structures are typically weathered steel with colors that range from gray to rust brown. The visual elements of these settings typically combine to produce medium scale Feature Landscape Compositions.

### **Suburban Valley Plains Unit**



The Suburban Valley Plains landscape character unit within the Syphon Draw study area consists primarily of contemporary residential developments with occasional occurrences of educational and/or institutional developments.

The predominant physical characteristics of this unit are the developed, walls, gateway features, small scale residential structures, small scale onsite flood control detention basins and the pattern and configuration of the arterial and residential street system. These developments are typically located on a predominantly flat to gently sloping ground plain containing a mixture of natural and ornamental trees, shrubs, ground covers, turf and inert materials typically arranged to produce an enhanced desert, semi-natural desert or desert park appearance. The arterial streets typically are typically configured in a straight grid pattern with wide walled setbacks with a wide variety of native and desert adapted trees, shrubs and ground covers that produce a formal parkway appearance. Interior residential streets and building arrangements typically are curvilinear in form and variable.

The predominant visual characteristics of the suburban valley plains unit are the cohesive architectural forms, styles and colors of the small scale residential structures that provide visual harmony within this unit. Visual variety is achieved through the organic curvilinear form of the residential street system and the irregular arrangement of the residential structures. Additional feature variety is derived from the irregular forms and patterns of open spaces within the residential developments. The observer position in these landscape units is typically inferior. Long vistas of the surrounding desert are typically truncated. The visual elements within the interior of the residential developments typically combine produce Enclosed Landscape Compositions. Another predominant visual characteristic of this landscape unit is the linearity of the arterial street system with its associated landscape setback areas and walls that combine to form

Enclosed Focal Landscape Compositions that serve to focus viewer attention upon natural and architectural features located at the terminus of their axis.

### **Urban Valley Plains Unit**



The Urban Valley Plains landscape character unit within the Siphon Draw study area primarily consists of moderate to large scale commercial retail developments.

The predominant physical characteristics of this unit are the form and architectural style of the “Big Box” structures and the large scale paved parking areas and gateway features that typically are associated with these developments.

The predominant visual characteristics of the urban valley plain unit is the geometric form of the large scale “Big Box” structures whose architectural forms, styles, materials and colors are designed enable these developments to stand out as feature attractions within the surrounding suburban residential setting. The visual elements of the urban valley plain are typically arranged to form a Feature Landscape Composition.

### **Industrial Valley Plains Unit**



The Industrial Valley plains landscape character unit is comprised mainly of warehouse and concrete mixing plant developments within the Siphon Draw Study Area.

The predominant physical characteristics of the Industrial Valley Plains unit includes the large scale geometric building forms and large cleared areas associated with the warehouse developments, and the large scale vertical cylindrical forms of the silos, horizontal forms of steel lattice conveyer systems, conical

forms of the materials storage piles and the expansive cleared parking/loading areas for cement mixing trucks that are associated with the concrete mixing developments.

The predominant visual characteristics of the Industrial Valley Plains are the geometric forms of the structural elements and the expansive cleared areas that are associated with these settings. The scale and form of these features interrupts the horizontality of the natural valley plains and also visually contrasts with the smaller human scale and forms associated with the surrounding suburban valley plains. The visual elements of the industrial valley plain landscape unit typically combine to form a Feature Landscape Composition.

### **Natural Valley Wash Unit**



The predominant physical characteristic of the Natural Valley Wash landscape character unit is the sinuous form of the shallow flat bottomed washes and their associated vertical sides slopes and flat over bank area. The predominant vegetative forms are dense stands of mesquite that form dense closed canopies, referred to as mesquite bosques, located within the over bank area of the washes that trace the form of the channel and stand out as feature attractions on the desert floor.

The predominant visual characteristics within these units are the parallel lines forming the edges of the wash and the stands of mesquite that are arranged to form Enclosed-Focal Landscape Compositions, and occasionally where the mesquite bosques become more extensive, they form Canopied Landscape Compositions.

## **Rural Valley Wash Unit**



The Rural Valley Wash landscape character unit within the Syphon Draw study area consists primarily of natural to semi-natural appearing drainages that have been channelized or natural washes with narrowed overbank areas.

The predominant physical characteristics of the rural valley wash unit is a generally straight and shallow U-shaped wash with a light to medium cover of natural overstory.

The predominant visual characteristics of this unit is the linear form of the overstory vegetation that stands out in contrast on the valley floor and the parallel lines of the edge of the wash that form a Focal Landscape Composition.

## **Suburban Valley Wash Unit**



The Suburban Valley Wash landscape character unit within the Siphon Draw Study Area typically consists of developed conveyance channels that provide flood protection for the adjacent suburban valley plains.

The predominate physical characteristics of the Suburban Valley Wash unit is a meandering shallow channel that typically varies from 3-5 feet deep with gentle side slopes (typically 6:1 or flatter). The Suburban Valley washes typically are vegetated with turf and native/introduced trees that produce a desert

park appearance, or they are surfaced with a combination of inert gravels with trees and shrubs arranged around the sides to produce the appearance of an enhanced natural desert landscape.

The predominate visual characteristics of this unit is the sinuous form of the channel, the fine textured middle green color of the turf areas and the massed groupings of trees located along the edges of the channel. The visual elements of the Suburban Valley Wash unit typically are arranged to form Focal Landscape Compositions.

### **Industrial Valley Wash Unit**



The Industrial Valley Wash landscape character unit within the Siphon Draw study area typically consists of concrete lined flood conveyance channels.

The predominate physical characteristics of the Industrial Valley Wash unit is a wide hardened channel extending to depths of 5 feet or more with steep side slopes, a uniform trapezoidal cross section and an alignment that is typically straight and devoid of vegetation.

The predominant visual characteristics are the visually dominant geometric form and linear configuration, large scale and light grey colors that characterize these units and produce strong visual contrasts with the form, materials, colors and scale of drainage features and other visual elements in the natural, rural and suburban landscape settings that typically surround these landscape units. The visual elements in these units typically combine to form Focal Landscape Compositions.

**2.1.1.4 Future Planned Landscape Character**

In order to plan for, and respond to, the future planned visual character of Maricopa County, the District has applied the aforementioned methodology to the MAG General Plan land use categories to produce a Future Planned Landscape Character Assessment of Maricopa County. Similar to the Existing Landscape Character Assessment, this information is derived by combining the Landscape Character Physical Settings map with the Future Planned Landscape Character Cultural Settings map that was developed from interpretation and reclassification of the MAG General Plan land use categories.

Table 3 contains a summary listing of the Future Planned Landscape Character Units that are identified in the District's LIA for the Siphon Draw project study area along with their approximate acreage. Approximately 62% of the study area is expected to become Suburban Valley Plains and another 28% is expected to become Industrial and Urban Valley Plains in the future. According to this assessment, Suburban, Urban and Industrial settings are expected to replace most of the existing Natural settings within the project study area in the future. The map in Figure 2-7 illustrates the distribution of the Future Planned Landscape Character Units within the Siphon Draw project study area.

**TABLE 3 Future Planned Landscape Character Units within Siphon Draw Project Study Area**

<b>Landscape Character Unit</b>	<b>Acres</b>	<b>% of Acres</b>
▪ Suburban Valley Plains	19,010	62
▪ Industrial Valley Plains	5,140	17
▪ Urban Valley Plains	3,257	11
▪ Natural Valley Plains	1,648	3
▪ Suburban Valley Wash	583	2
▪ Rural Valley Plains	503	2
▪ Industrial Valley Wash	262	>1
▪ Urban Valley Wash	87	>1
▪ Natural Valley Wash	73	>1
<b>Total</b>	<b>30,566</b>	

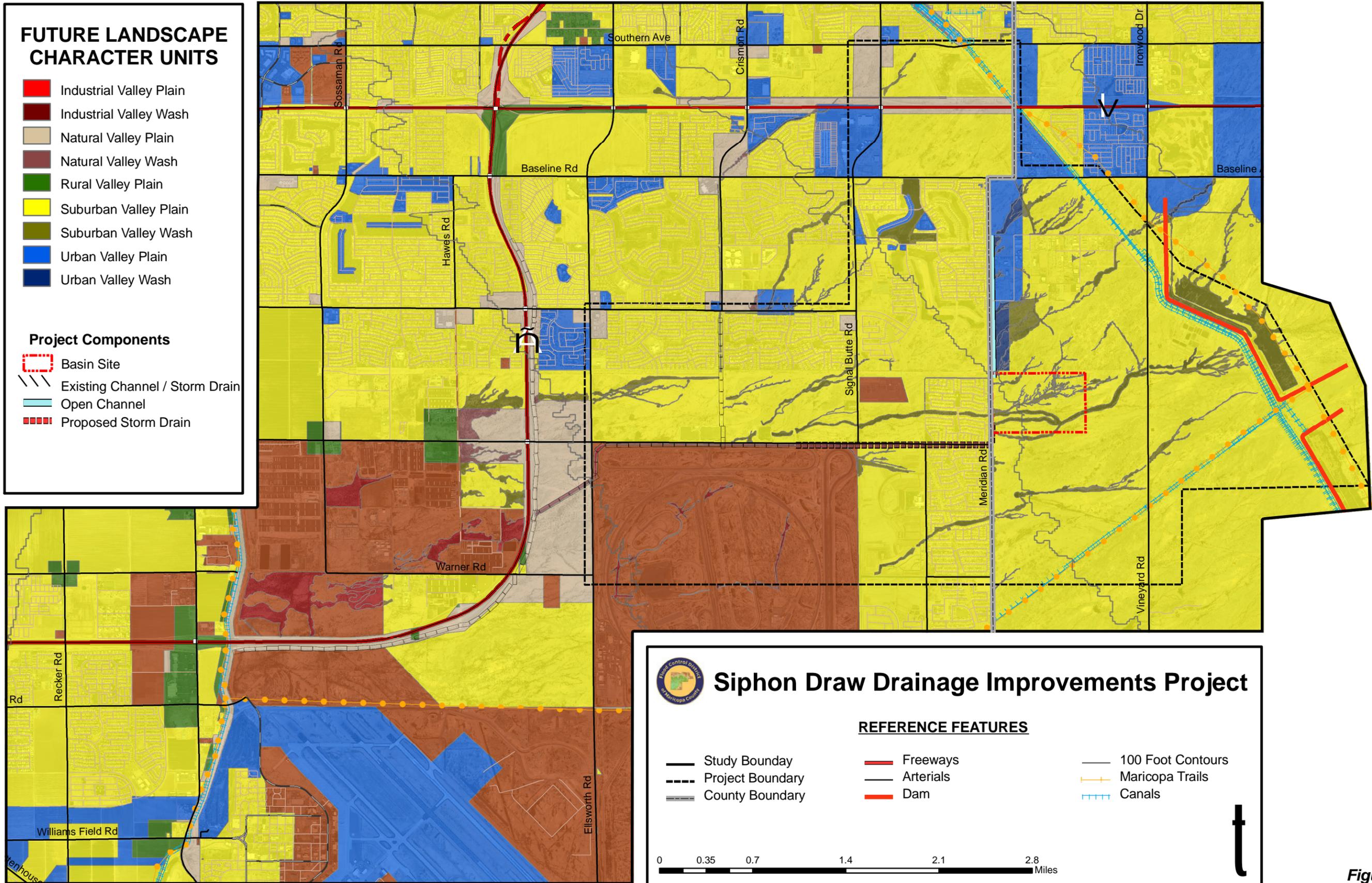


Figure 2-7

## **2.1.2 Landscape Variety Classes**

Landscape Variety Classes provide a measure of overall scenic quality, attractiveness and importance of landscapes found within Maricopa County. Landscape Variety Classes are based upon the premise that all landscapes have some scenic value, but those with the most distinctive variety have the greatest potential for high scenic appeal and value.

There are three Landscape Variety Classes that help to identify the overall scenic quality of landscapes of Maricopa County:

Variety Class A	Distinctive Variety
Variety Class B	Common Variety
Variety Class C	Minimal Variety

Variety Class A landscapes include areas containing landforms, vegetation, rock formations, water, cultural features or combinations thereof with distinctive or unusual variety. They are usually not common within the Sonoran Desert Character type. Variety Class A may include landscape features that are unique to the character type and contribute significantly to its identity and unique sense of place. They include features that are recognized nationally or internationally and those that are protected under Arizona State laws or local ordinances. Examples of the latter include areas containing Saguaro (the signature plant of the Sonoran Desert), other protected native plant species and historically significant cultural features found in Maricopa County. Variety Class A+ landscapes are those areas within the Variety Class A landscapes that have outstanding variety.

Variety Class B landscapes include areas with features that contain variety in their form, line, color texture, scale or combinations thereof but which tend to be common throughout the character type and are not outstanding in scenic quality.

Variety Class C landscapes include areas with features that have little change in form, line, color and texture, and includes all areas not found under Classes A and B.

### **2.1.2.1 Scope and Methodology**

The Landscape Variety Classes inventory and analysis contained in the District's LIA for Maricopa County is a countywide regional assessment that is adapted from the approach outlined in the USDA Forest Service Visual Management System. The District's implementation of this methodology is intended to serve primarily as a framework for the preliminary identification of distinctive landscape features and other areas of high scenic quality that should be preserved or retained in order to maintain the desired visual character of the setting. The District's Landscape Variety Classes inventory is also intended to serve as a general tool for the identification of areas lacking in visual variety where landscape enhancement may be a desired complementary goal of flood control project implementation.

The Landscape Character Types and Subtypes that have been identified and described in the *Preliminary Existing Landscape Character Assessment for Maricopa County* were utilized as a frame of reference for judging the physical features of landscape areas having distinctive, common or minimal variety. Features such as landforms, vegetation, waters or rock formations were compared singularly or in combination with those commonly found within the Character Type. Using this approach, the variety class rating criteria for the Sonoran Desert and Tonto Character Types contained in the USDA Forest Service publication titled *Landscape Character Types of the National Forests in Arizona and New Mexico* was adapted for use in Maricopa Country as illustrated in Table 4.

**TABLE 4 SONORAN DESERT CHARACTER TYPE VARIETY CLASS RATING CRITERIA**

	<b>Landform</b>	<b>Vegetation</b>	<b>Water</b>	<b>Cultural Forms</b>
<b>Variety Class A - Distinctive</b>	<p>Distinctive or highly varied topography. Includes craggy mountain peaks, sharp ridges, well defined foothills, bajadas, and interior mountain valleys.</p> <p>Isolated mountains, inselbergs, buttes, foothills, and rock formations with distinctive form or color contrast that become focal points.</p> <p>Deep gorges, ravines, or valleys with vertical or nearly vertical walls and/or unusual forms and color.</p> <p>Escarpments, cliffs, talus slopes, and other forms that dominate the surrounding landscape because of their scale, form, color, or texture.</p>	<p>Distinctive vegetation forms or highly varied vegetation patterns.</p> <p>Native cottonwood galleries and other riparian deciduous forests that exhibit the normal range of sizes, forms, species, colors, textures, edges, and patterns.</p> <p>Areas with saguaro or the paloverde-mixed cacti plant communities.</p> <p>Mesquite bosques and/or other mesophytic riparian hardwood stands that form distinctive linear patterns along dry washes and arroyos.</p> <p>Extra large or otherwise unique stands of vegetation.</p>	<p>Natural and manmade lakes and reservoirs.</p> <p>Primary and secondary river channels and terraces including, for example, the Hassayampa, Verdi, Agua Fria, Gila, Salt, New River, Cave Creek, Queen Creek, and many others.</p> <p>Arroyos and washes in the mountain lands and valley plains that contain sandy bottoms that are at least 8 feet wide.</p> <p>Hot springs and/or geothermal vents.</p>	<p>Architectural features with distinctive or unusual form, color, texture, materials, or scale that establish a unique sense of place and positive variety in the landscape.</p> <p>Cultural features identified as having historical significance.</p>
<b>Variety Class B - Common</b>	<p>Terrain is moderately varied.</p> <p>Mountains and ridges that are surrounded by similar landforms and are not otherwise distinctive.</p> <p>Rock formations, foothills, and other landforms that remain subordinate to the surrounding landscape due to their size.</p> <p>Bajadas, volcanic fields, and upland areas with rolling topography that are not well defined by adjacent landforms.</p>	<p>Vegetation is moderately varied.</p> <p>Paloverde-mixed cacti plant communities that exhibit sub-normal range of sizes forms, colors, textures, and spacings.</p> <p>Creosote bush-bursage desert scrub combined in moderately defined patterns with desert pavement and/or rockland and/or mesophytic woodland.</p> <p>Creosote bush-bursage desert scrub combined with riparian deciduous woodland in patterns that offer some visual variety.</p>	<p>Water are moderately varied.</p> <p>Includes small arroyos and dry washes not otherwise identified.</p>	<p>Cultural forms are moderately varied.</p> <p>Areas with cultural features that offer some positive variety in form, color or texture.</p>
<b>Variety Class C - Minimal</b>	<p>Terrain is unvaried.</p> <p>Flat or nearly flat valley floors and plains.</p>	<p>Vegetation is unvaried.</p> <p>Extensive areas of similar vegetation such as creosote bush-bursage that have very limited variation in form, color, texture, or pattern.</p>	<p>Water are absent.</p>	<p>Cultural forms are absent or unvaried.</p> <p>Extensive areas of cultural features that offer little variation in form, color, or texture.</p>

The rating criteria in Table 4 was then utilized to assess and assign a predominant variety class rating to each of the Landscape Character Physical Divisions identified in the District's LIA for Maricopa County. Table 5 contains a summary listing of the Variety Class ratings for the Physical Divisions that occur within the Siphon Draw project study area.

**TABLE 5 Application Variety Class Rating Criteria to the Physical Settings of the Siphon Draw Project Study Area**

Landscape Character Type, Subtype, and Physical Settings	Landscape Variety Classes		
	A	B	C
Sonoran Desert Character Type Valleylands Subtype Valley Rivers and Washes Setting Valley Plains Setting	X (X)	(X)	X
Key: X = Predominant Variety Class (X) = Occasionally Applicable Variety Class Blank = Seldom, if ever, Applicable Variety Class			

**2.1.2.2 Predominant Landscape Variety Classes within the Project Study Area**

Approximately 3% of the study area is classified as having outstanding or distinctive scenic quality based upon the application of the above-mentioned rating criteria. The remainder of the project area is predominantly characterized as having minimal landscape variety (Variety Class C). Variety Class A+ features were not found within the project study area. The acreages of the Variety Classes within the project study area are listed below. The distribution of Variety Classes within the project study is shown on the map in Figure 2-8.

- Variety Class A - 806 acres
- Variety Class C - 29,768 acres

**Special Note**

Use of the District's Landscape Variety Classes mapping is limited to the identification of distinctive natural features. It does not include an identification of cultural landscape features that may have high scenic importance. An analysis of the scenic importance of the cultural landscape features of the project study area is expected to be undertaken as a part of a more detailed site analysis for the project alternatives.

## Variety Class A



Variety Class A areas comprise approximately 3% of the Siphon Draw project study area. The features and areas within the project study area that have distinctive visual variety include Siphon Draw Wash and the other washes with their associated riparian vegetation that have been identified within the study area. These washes are visually distinctive primarily for the vegetative and landform variety they provide which is in contrast to the predominant horizontality of the Valley Plain. The wash settings within the Siphon Draw project study area represent the natural features of highest visual quality and scenic importance within the project study area that are worthy of preservation and enhancement. The photo above is an example of an area with distinctive landscape variety within the Siphon Draw project study area. The location and distribution of these features within the project study area are shown on the map in Figure 2-8.

## Variety Class C



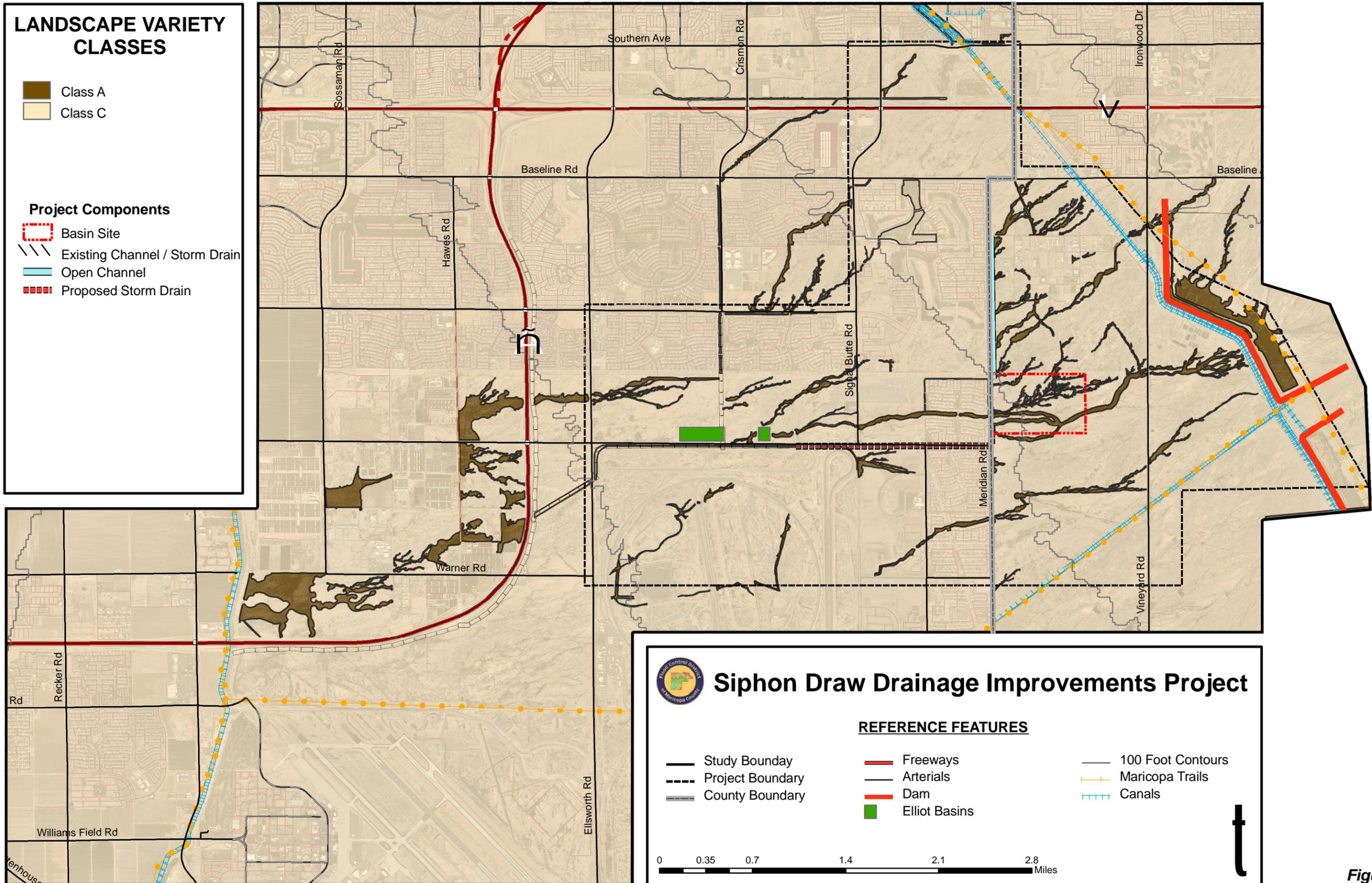
The valley plains physical settings are representative of landscapes with minimal landscape variety within the project study area. These settings typically exhibit limited variety in landform, rock form, texture, and/or vegetation. Landforms and vegetative colors, forms and patterns are typically uniform and lack elements of high visual interest. The photo above is representative of a Variety Class C landscape setting within the Siphon Draw project study area.

### LANDSCAPE VARIETY CLASSES

- Class A
- Class C

### Project Components

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



## Siphon Draw Drainage Improvements Project

### REFERENCE FEATURES

<span style="display: inline-block; border-bottom: 2px solid black; width: 20px; margin-right: 5px;"></span> Study Boundary	<span style="display: inline-block; border-bottom: 2px solid red; width: 20px; margin-right: 5px;"></span> Freeways	<span style="display: inline-block; border-bottom: 1px solid grey; width: 20px; margin-right: 5px;"></span> 100 Foot Contours
<span style="display: inline-block; border-bottom: 2px dashed black; width: 20px; margin-right: 5px;"></span> Project Boundary	<span style="display: inline-block; border-bottom: 2px solid red; width: 20px; margin-right: 5px;"></span> Arterials	<span style="display: inline-block; border-bottom: 1px dashed yellow; width: 20px; margin-right: 5px;"></span> Maricopa Trails
<span style="display: inline-block; border-bottom: 2px dashed grey; width: 20px; margin-right: 5px;"></span> County Boundary	<span style="display: inline-block; border-bottom: 2px solid orange; width: 20px; margin-right: 5px;"></span> Dam	<span style="display: inline-block; border-bottom: 2px dashed blue; width: 20px; margin-right: 5px;"></span> Canals
	<span style="display: inline-block; width: 10px; height: 10px; background-color: green; border: 1px solid black; margin-right: 5px;"></span> Elliot Basins	

t

Figure 2-8

### **2.1.3 Visual Sensitivity Levels**

Visual Sensitivity Levels provide a measure of people's concern for the visual character and beauty of landscapes within Maricopa County. Visual Sensitivity Levels take into account the numbers and types of viewers, their concern for the visual environment, and the relative visibility of landscape areas within Maricopa County to those viewers.

It is recognized that most of Maricopa County is situated within the Basin and Ranges Physiographic Province and is predominantly a large panoramic feature landscape that characteristically affords mostly unobstructed views of its valley floors, rivers and isolated mountain ranges. It is further recognized that virtually all of Maricopa County is visible from aircraft users. Therefore, some degree of visual sensitivity exists for the entire land base of Maricopa County.

There are three Visual Sensitivity Levels. Each level identifies a different level of user concern for the visual environment.

- Level 1 – Highest Sensitivity
- Level 2 – Average Sensitivity
- Level 3 – Lowest Sensitivity

The Visual Sensitivity Levels for travelways in Maricopa County were established and mapped in the Districts LIA through a process that involved an inventory of travelways and then determination of the numbers of viewers and their relative level of concern for landscape aesthetics.

#### **2.1.3.1 Travelways Inventory**

An inventory of travelways in GIS from the Maricopa County Department of Transportation (MCDOT) was utilized as a basis for establishment and mapping of visual sensitivity Levels for travel routes within the Maricopa County. A merged GIS coverage was created that contains both roadway and trails data. The trails data in this coverage is limited to the Maricopa Regional Trail System at this time. Future updates of the travelways coverage may be expanded to include trails data from other sources. The travelways map does not include railway lines at this time, nor does it include aircraft take off and landing flight paths from major airports within the county.

#### **2.1.3.2 Primary and Secondary Route Designations**

Travel routes in the inventory were categorized as being of either primary or secondary importance within Maricopa County based upon their general type and levels of use. These designations were based upon an interpretation of the criteria outlined in the publication titled *National Forest Landscape Management Volume 2, Chapter 1, The Visual Management System, Agriculture Handbook Number 462, USDA Forest Service, April, 1974*.

Primary travel routes typically include roads and trails having national, statewide or regional importance, high use levels and long use duration. Secondary travel routes typically include roads and trails having local significance, low use volume and/or short use duration.

### 2.1.3.3 Viewer Concern Levels

Viewer concern for the visual environment is expressed as either major or minor. Viewers with major concern typically include residents traveling within a local community and people who are driving for pleasure and viewing scenery, hiking trails or engaged in recreation activities in which the quality of the visual environment is an essential component of their experience. Viewers with minor concern for landscape aesthetics are typified by people traveling through an area for commercial purposes. There are three viewer concern levels based upon the degree to which viewers with major concerns are estimated to be represented in each travelway category on average daily:

- High            75 percent or more viewers have Major concerns for the visual environment
- Moderate     25-75 percent of viewers have Major concerns for the visual environment
- Low            Less than 25 percent of viewers have Major Concerns for the visual environment

### 2.1.3.4 Establishment of Visual Sensitivity Levels

Visual Sensitivity levels were identified for each travelway in the inventory using criteria in Table 6, which was excerpted from USDA Handbook 462.

**TABLE 6 Summary Table for Visual Sensitivity Levels**

Importance/ Use Level	Sensitivity Level		
	1	2	3
Primary Travelway	At least 25 percent of users have major concerns for scenic resources.	Less than 25 percent of users have major concerns for scenic resources.	
Secondary Travelway	At least 75 percent of users have major concerns for scenic resources.	25 to 75 percent of users have major concerns for scenic resources.	Less than 25 percent of users have major concerns for scenic resources.

The Viewer Concern Levels and Visual Sensitivity Level ratings that have been identified for travelways in Maricopa County are shown in Table 7. These ratings reflect the viewer concern levels and visual sensitivity levels that are most typical, prevalent or expected within Maricopa County. Exceptions can and do occur (see note attached to table). More detailed assessments and refinements of sensitivity levels may be undertaken during project scenic resource assessments.

**TABLE 7 Visual Sensitivity Level Ratings for Travelways in Maricopa County**

Travelway Importance	Viewer Concern Levels for Aesthetics			Visual Sensitivity Level		
	High	Moderate	Low	1	2	3
Primary Roads						
Interstate Highway		*		*		
Freeway		*		*		
State Highway		*		*		
Other Divided Highway		*		*		
Arterial Streets (paved)	*/1			*/1		
Arterial Streets (unpaved)	*/1			*/1		
Scenic Route	*			*		
Trails						
Maricopa Regional Trail System	*			*		
Secondary Roads						
Collector Streets	*/1			*/1		
All Other Streets and Roads			*			*
Scenic Route	*			*		
Trails						
All Other Trails	*			*		
/1 Exceptions to Sensitivity Levels Ratings: Arterial and Collector streets located within Industrial Landscape Character Cultural Settings usually have low viewer concern levels and are typically rated as Visual Sensitivity Level 3.						

**2.1.3.5 Viewing Distance Zones**

The Sensitivity levels were further stratified into viewing distance zones during the process of mapping visible areas from the primary travel routes in Maricopa County. The viewing distance zones include the following:

<u>Viewing Distance Zone</u>	<u>Near Boundary</u>	<u>Far Boundary</u>
Foreground	0 mile	¼ mile
Middleground	¼ mile	3 miles
Background	3 miles	infinity

**2.1.3.6 Visual Sensitivity Levels Mapping**

The Visual Sensitivity Levels map for Maricopa County contained in the District's LIA was prepared by buffering all of the travelways designated as Sensitivity Level 1. This included all of the Primary Travel Routes and the Collector Streets listed under the Secondary Travel Routes. The buffering was done at ¼ mile and 3 miles distance from each of the aforementioned travelways to represent the Foreground, Middleground and Background viewing distance zones.

The approach taken in the mapping assumes that virtually all landscape areas in Maricopa County are visible from travelways classified as Visual Sensitivity Levels 1. For this reason, travelways classified as Visual Sensitivity Level 2 and 3 in Maricopa County were not mapped as a part of this project.

**2.1.3.7 Travelway Visual Sensitivity Levels within the Siphon Draw Project Study Area**

Table 8 contains a summary listing of the major travelways identified as sensitivity Level 1 (high) that are located within the Siphon Draw Study project study area. Approximately 88% (26,888 acres) of the project study area is situated within the Foreground Sensitivity Level 1 zone and is high in visual sensitivity. The remainder of the study area is located within the Middleground Sensitivity Level 1 zone. The distribution of Visual Sensitivity Levels within the project study area is shown on the map in Figure 2-9.

**TABLE 8 Travelways within the Siphon Draw Project Study Area**

<b>TRAVELWAYS</b>	
State Highways	<ul style="list-style-type: none"> <li>US Highway 60</li> <li>LOOP 202 Santan Freeway</li> </ul>
Divided Highways	<ul style="list-style-type: none"> <li>US Highway 60</li> </ul>
Major Arterials	<ul style="list-style-type: none"> <li>Southern Avenue</li> <li>Recker Road</li> </ul>
Scenic Routes	<ul style="list-style-type: none"> <li>US Highway 60</li> </ul>
Trails	<ul style="list-style-type: none"> <li>Maricopa Regional Trail System                             <ul style="list-style-type: none"> <li>▪ Segment 28 - East Maricopa Floodway</li> <li>▪ Segment 51 - Central Arizona Project</li> <li>▪ Segment 52 - Central Arizona Project</li> <li>▪ Segment 53 - Central Arizona Project</li> <li>▪ Segment 83 – Power line Floodway in Maricopa county</li> <li>▪ Segment 84 – Power line Floodway in Pinal county</li> </ul> </li> </ul>

**TRAVELWAY VISUAL SENSITIVITY LEVELS**

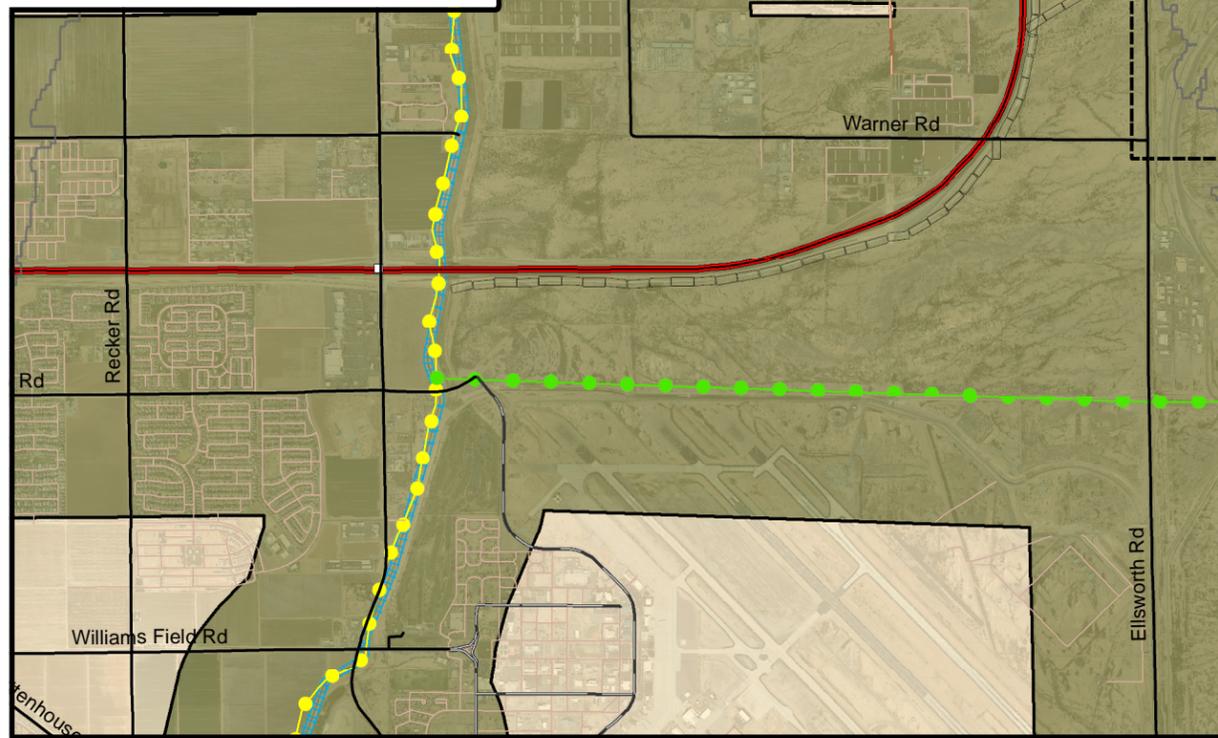
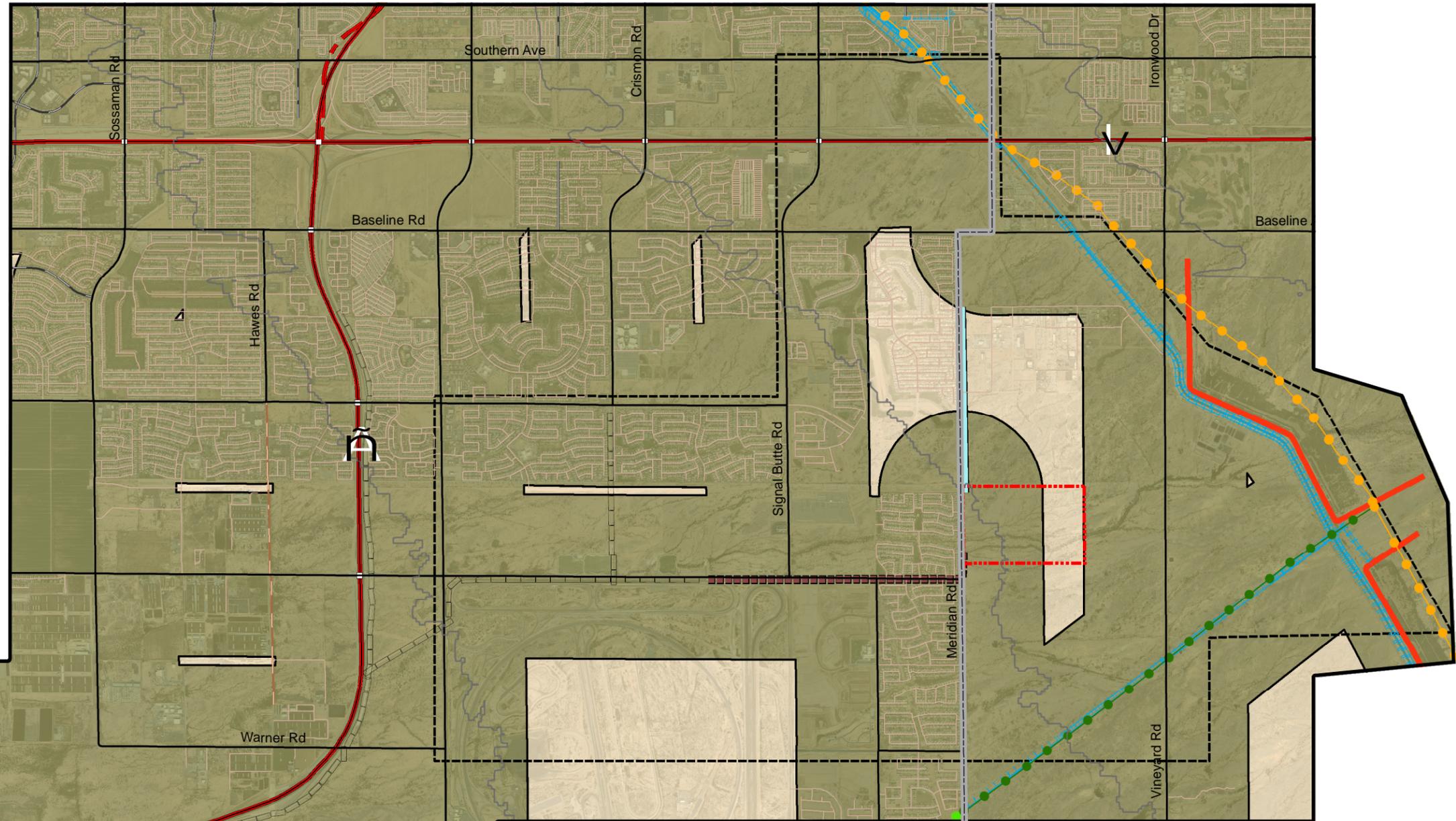
- Foreground Sensitivity Level 1 - Highest
- Middleground Sensitivity Level 1 - Moderate
- Major Arterials
- Scenic Routes

**Maricopa Regional Trail System**

- Segment 28
- Segment 51-53
- Segment 83
- Segment 84

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



**Siphon Draw Drainage Improvements Project**

**REFERENCE FEATURES**

- Study Boundary
- Project Boundary
- County Boundary
- Freeways
- Arterials
- Dam
- 100 Foot Contours
- Maricopa Trails
- Canals

0 0.35 0.7 1.4 2.1 2.8 Miles

Figure 2-9

## **2.2 RECREATION & OPEN SPACE RESOURCES**

The planning and design of flood control facilities to increase their year round value and benefit to the public by incorporating opportunities for recreation multi-use to meet existing and future local community needs for recreation, trails, open spaces and alternative forms of transportation, to the fullest extent consistent with the District's legal charter, is a primary goal of the District's Mission and Vision statements. The achievement of this goal is recognized by the District as essential for gaining public and stakeholder support and for District flood control programs and for increasing opportunities for cost share partnering in the construction, maintenance and operation of District flood control facilities.

The Recreation and Open Space Resource Assessment for Maricopa County contained in the District's LIA was utilized for the data collection and analysis of recreation and open space resources for the Siphon Draw project study area. The Recreation and Open Space Resource Assessment for Maricopa County is a regional assessment that has been developed by the District for use in planning studies to assist in identifying the need for protection and enhancement of existing recreation resources and opportunities for integration of future public recreation needs into proposed flood control projects. The assessment includes an inventory of existing parks, recreation areas and open spaces within Maricopa County. It also includes an analysis of the relative compatibility of these recreation resources with a variety of flood protection methods that are routinely applied by the District in delivering flood protection services and facilities to the citizens of Maricopa County.

The Recreation and Open Space Resource Assessment for Maricopa County is intended to serve as a tool for broad scale regional planning studies and a framework and starting point for more detail studies of recreation resources that are undertaken as a part of flood control project planning and design. The Recreation Resource Assessment of Maricopa County currently is limited to an inventory and analysis of existing parks, recreation areas and open spaces in Maricopa County. It is expected that this assessment will be expanded and updated as a part of the planning and design efforts that are undertaken as a part of the Siphon Draw Drainage Improvements Project.

The information from the Recreation and Open Space Assessment in the LIA was supplemented with information from the City of Mesa pertaining to planned parks located within and near the project study area. Information pertaining to parks and trails was requested from the City of Apache Junction but was not provided prior to the completion of this report. The Community map on the City of Apache Junction's web site was reviewed. At this time, existing or planned parks, trails or open space areas are not known to exist within the Siphon Draw project study area.

### **2.2.1 Regionally Significant Recreation and Open Space Resources**

Regionally significant recreation resources, as defined by the District in its *Landscape Architecture Consultant Handbook*, include all Federal Wilderness Areas and National Monuments, State Parks and Wildlife Areas, County Parks and Recreation Areas, the Maricopa Regional Trail System, and City Regional Parks and Preserves, situated within 10 miles of the project study area.

Several major segments of the Maricopa Regional Trail are located within, and adjacent to, the project study area. These segments include the East Maricopa Floodway, the Powerline Floodway and the Central Arizona Project. The Utery Mountain County Recreation Area is located approximately four miles due north of the project area and is accessible from the Maricopa Regional Trail System planned along the Central Arizona Project Canal. Lost Dutchman State Park is located approximately eight miles northeast of the project area on Apache Trail Road. The San Tan County Regional Park is located approximately 9 miles due south of the project area and is accessible via the Maricopa Regional Trail System planned

along the East Maricopa Floodway. Additionally the segment of the East Maricopa Floodway that is situated within the project study area is identified in the MAG Desert Spaces Plan as a Retention Open Space area. These recreation resources are shown on the map in Figure 2-10. The presence of these regionally significant recreation resources within and adjacent to the project area suggests there may be significant multi-use opportunities for use of proposed conveyance channels for the Siphon Draw Drainage Improvements Project to expand access to the regional trail and regional recreation resources located in proximity to the project study area.

### **2.2.2 Local Recreation and Open Space Resources**

Existing local recreation resources located within the project area include the Sunland Springs Village Golf Course and the existing City of Mesa sports field complex located within the District's Elliot Basins. Planned future recreation facilities within the project area include an expansion of the facilities between the Elliot Basins. Existing recreation resources within the project study area include the Augusta Ranch Community Park and the Skyline Mesa Community Park in the City of Mesa. A future city park is also identified at the intersection of Hawes Road and Medina Avenue. A large number of golf courses are also located within the project study area. Table nine provides a summary of the existing and planned local recreation resources within the project study area. The map shown in Figure 2-11 illustrates the location of these resources.

**TABLE 9 Parks and Open Spaces within the Siphon Draw Project Study Area**

<b>Recreation Type</b>	<b>Acres</b>	<b>% of Study Area</b>
<ul style="list-style-type: none"> <li>▪ Regional County Open Space               <ul style="list-style-type: none"> <li>- East Maricopa Floodway</li> </ul> </li> </ul>	121	>1
<ul style="list-style-type: none"> <li>▪ Local Golf Courses               <ul style="list-style-type: none"> <li>- Arizona Golf Resort Public Mesa GC</li> <li>- Apache Creek Public Apache Junction GC</li> <li>- Augusta Ranch Public Mesa GC</li> <li>- Desert Sands Public Mesa GC</li> <li>- Fountain of the Sun Private Mesa GC</li> <li>- Sunland Springs Village Public Mesa GC</li> <li>- Sunland Village East Public Mesa GC</li> <li>- Toka Sticks Public Mesa GC</li> </ul> </li> </ul>	686	>1
<ul style="list-style-type: none"> <li>▪ Local City Parks               <ul style="list-style-type: none"> <li>-Augusta Ranch Mesa Community Park</li> <li>-Elliot Basin Mesa Community Park</li> <li>-Skyline Mesa Community Park</li> <li>-Planned Future Parks                   <ul style="list-style-type: none"> <li>City of Mesa Park at Hawes Road and Medina Avenue</li> <li>City of Mesa Park at Elliot Road and Crismon Road</li> </ul> </li> </ul> </li> </ul>	90	>1

**REGIONALLY SIGNIFICANT RECREATION & OPEN SPACE RESOURCES**

**Federal**

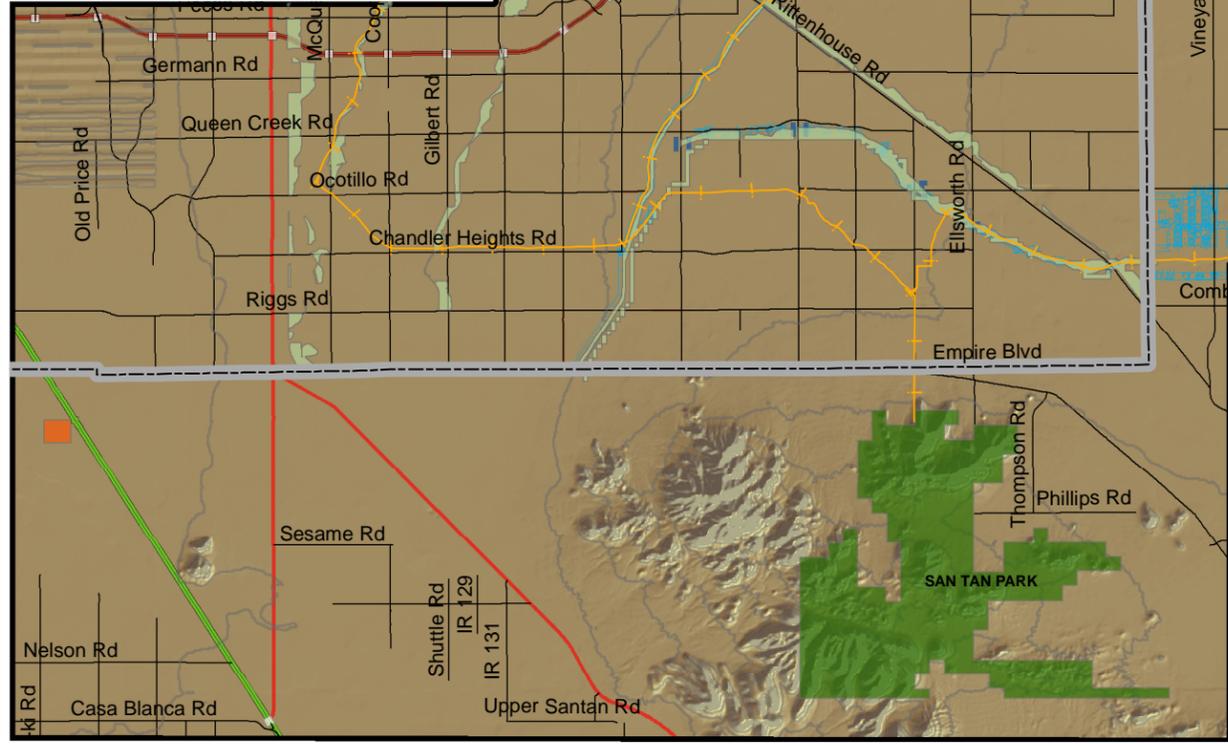
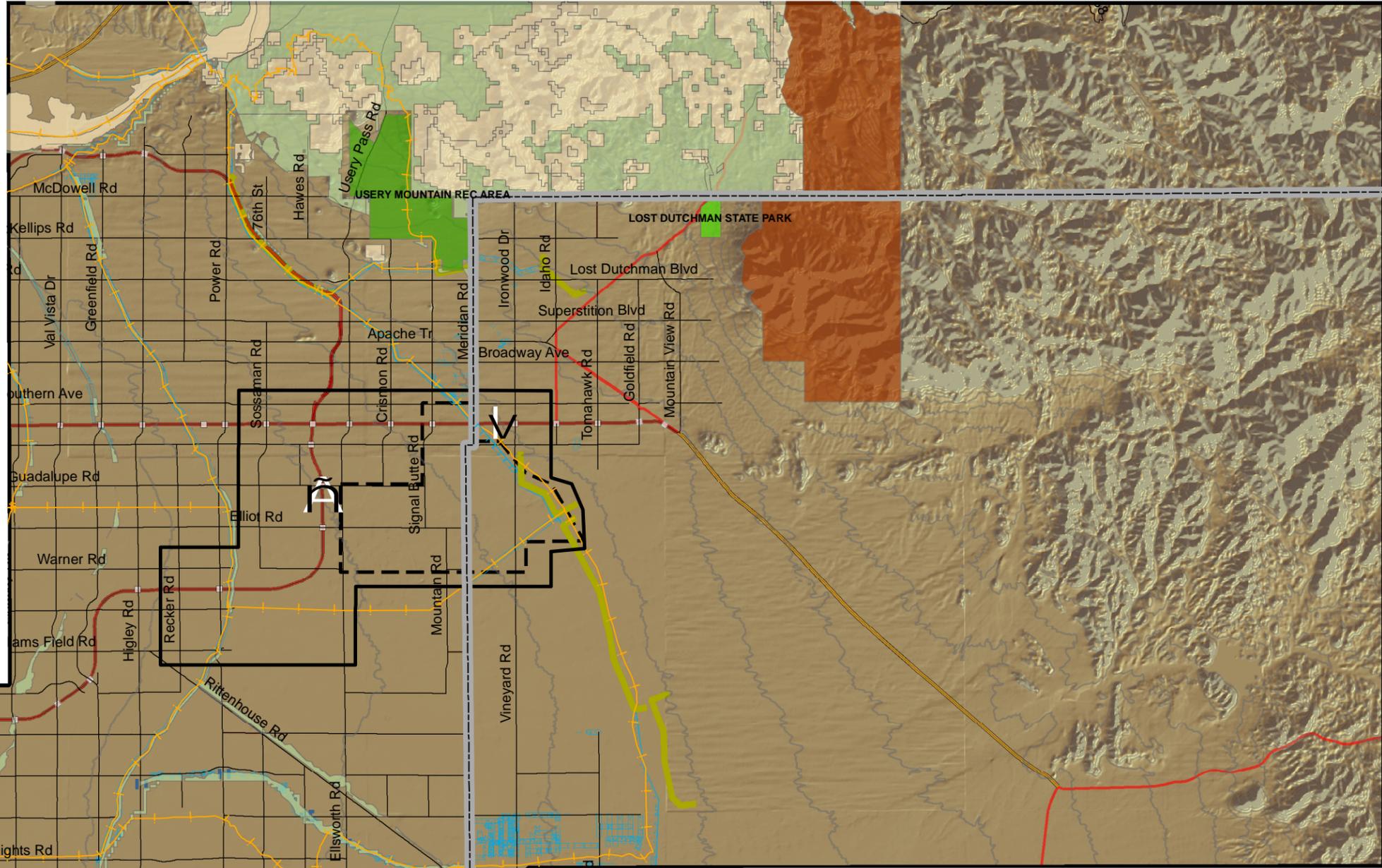
- Wilderness Areas
- National Mounments

**Regional**

- County Regional Parks
- County Recreation Areas
- City Regional Parks

**Regional County Open Spaces**

- Retention Areas
- Conservation Areas



## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

<span style="display: inline-block; width: 20px; border-bottom: 2px solid black; margin-right: 5px;"></span> Study Boundary	<span style="display: inline-block; width: 20px; border-bottom: 2px solid red; margin-right: 5px;"></span> Freeways	<span style="display: inline-block; width: 20px; border-bottom: 1px solid gray; margin-right: 5px;"></span> 100 Foot Contours
<span style="display: inline-block; width: 20px; border-bottom: 2px dashed black; margin-right: 5px;"></span> Project Boundary	<span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span> Arterials	<span style="display: inline-block; width: 20px; border-bottom: 1px dashed orange; margin-right: 5px;"></span> Maricopa Regional Trail
<span style="display: inline-block; width: 20px; border-bottom: 1px solid gray; margin-right: 5px;"></span> County Boundary	<span style="display: inline-block; width: 20px; border-bottom: 2px solid green; margin-right: 5px;"></span> Dam	<span style="display: inline-block; width: 20px; border-bottom: 1px dashed blue; margin-right: 5px;"></span> Canals

0 0.5 1 2 3 4 Miles

Figure 2-10

**PROJECT STUDY AREA  
PARKS AND OPEN SPACES**

**Regional County Open Spaces**

MAG Retention Open Space Areas

**Local**

Golf Courses

City Parks

**Trail Corridors**

CAP Canal Brown to Meridian

RWCD Canal

SE Mesa Powerline

Maricopa Regional Trail

**Wildlife Linkage Corridor**

Central Arizona Project

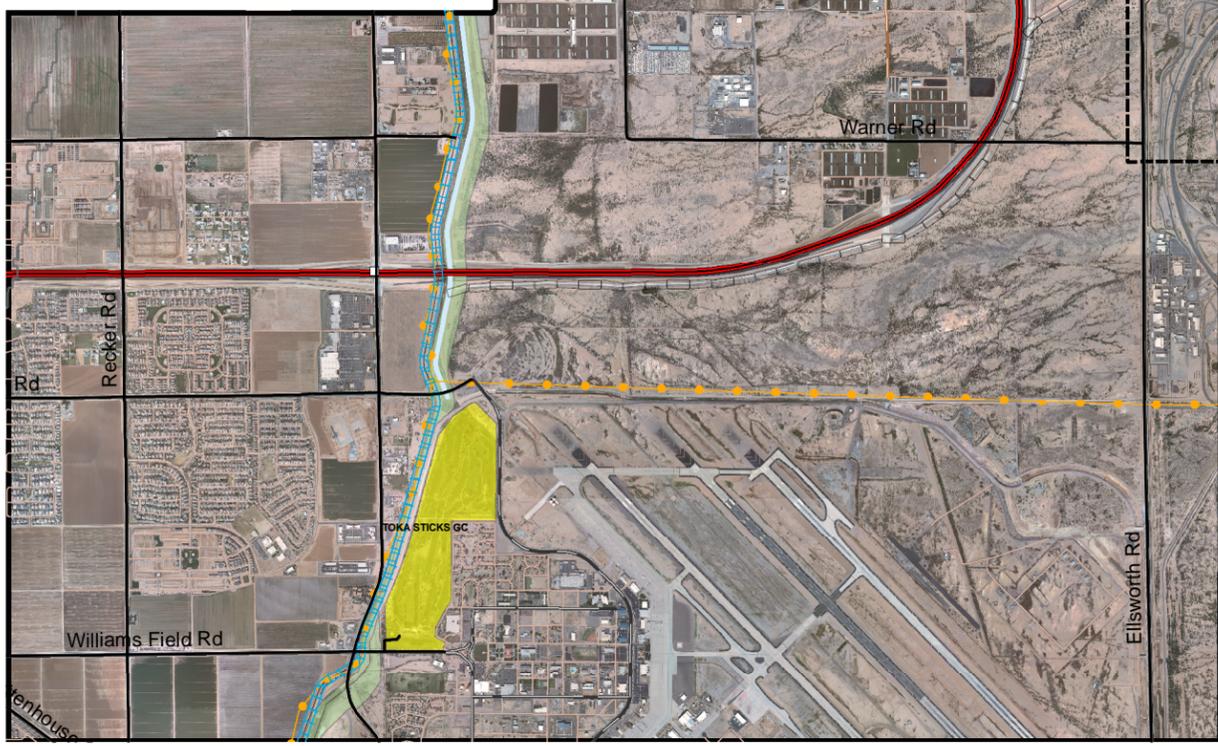
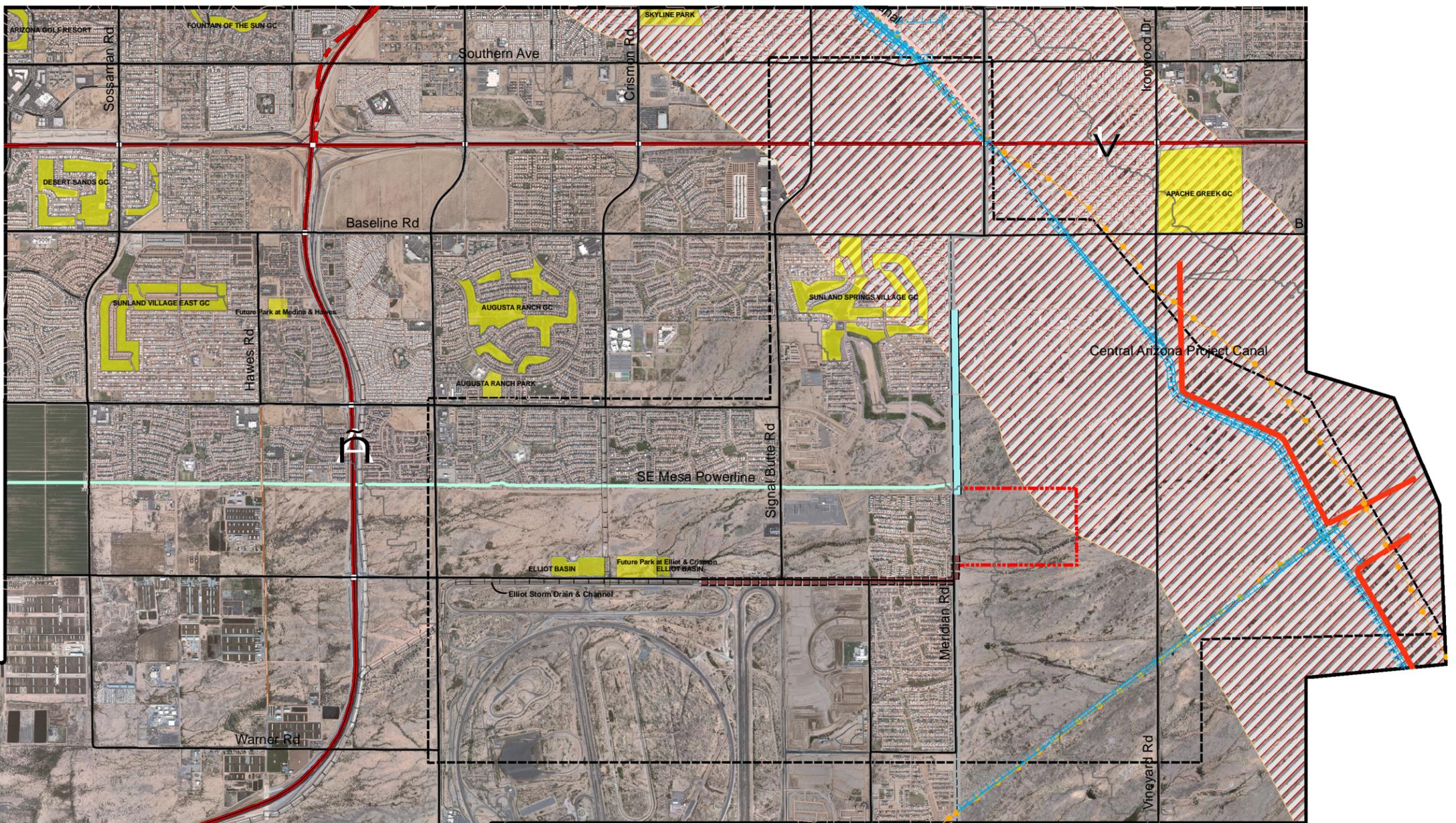
**Project Components**

Basin Site

Existing Channel / Storm Drain

Open Channel

Proposed Storm Drain



## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

Study Boundary	Freeways	100 Foot Contours
Project Boundary	Arterials	Canals
County Boundary	Dam	

0    0.35    0.7    1.4    2.1    2.8 Miles

Figure 2-11

# 3. Data Analysis and Recommendations

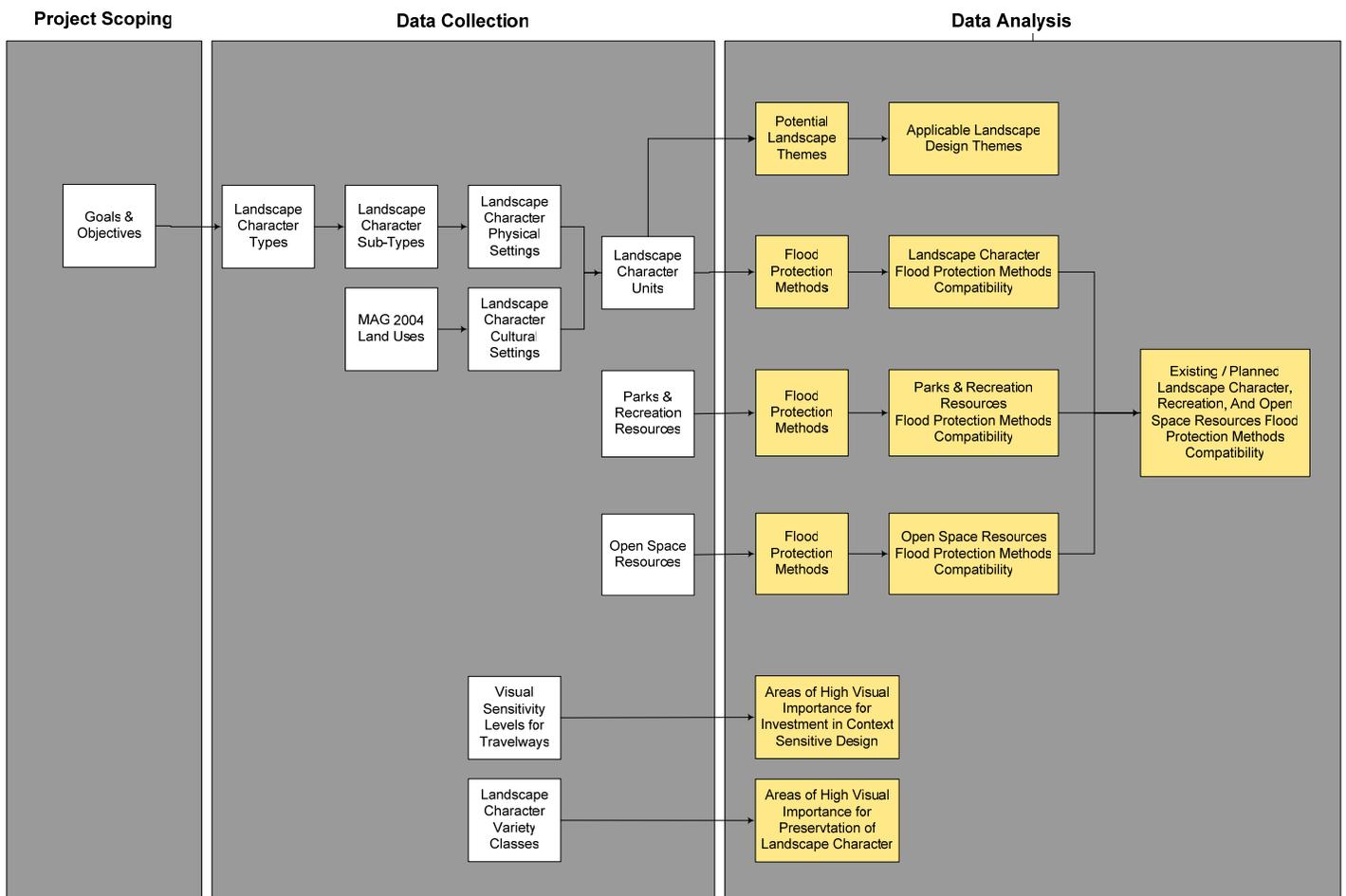
## 3.1 Flood Protection Methods Compatibility

## 3.2 Landscape Design Themes

## 3.3 Landscape Preservation Recommendations

## 3.4 Need for Context Sensitive Flood Control Solutions

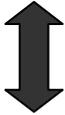
## 3.5 Recommended Landscape Design Guidelines



### 3.1 Flood Protection Methods Compatibility

The Flood Control District of Maricopa County routinely evaluates a variety of flood protection methods for possible use in delivering flood control solutions to the citizens of Maricopa County. Flood protection method compatibility refers to the relative ability of the different methods to achieve context sensitivity with the visual, recreation and open space environments of Maricopa County. The District has established Flood Protection Method Compatibility Ratings and Flood Protection Compatibility Class Maps in its countywide LIA for six different flood protection methods that are typically considered by the District in planning studies and project design alternatives. The flood protection methods include both non-structural (regulatory) and structural methods. The structural methods typically include construction of large scale conveyance channels, levees, storage basins, flood retarding structures and dams. The six flood protection methods are identified in Table 10.

**Table 10 Flood Protection Methods**

Flood Protection Methods	Context Sensitivity Potential	Compatibility Class
Non-Structural Soft-Structural Semi-Soft Structural Hard Structural with Aesthetic Treatments Semi-Hard Structural Hard Structural	Highest  Lowest	1
		2
		3
		4
		5
		6

The above flood protection methods are arrayed as a spectrum, wherein each successive method has an increasing potential for achieving context sensitivity with the visual, recreation and open space environments of Maricopa County. The Non-Structural Method, for example, would be compatible with the largest number of environments in Maricopa County, whereas the Hard Structural Method would be compatible with the fewest. Additionally, under this arrangement, areas identified as being compatible with the Semi-Soft Structural Method (Compatibility Class 3) would also be compatible with the Soft Structural and Non-Structural Methods. Likewise, any Landscape Unit identified as being compatible with the Hard Structural method would be compatible with all of the other five methods. Hence, the compatibility class number assigned to each method, and shown on the compatibility class maps, represents the number of flood protection methods that are expected to be compatible with the areas so designated.

The flood protection compatibility ratings and class maps developed by the District are intended to serve as a planning and design tool to assist in the development of context sensitive flood control solutions. They are also intended to serve as a tool for analyzing and comparing the extent to which planning and design alternatives are likely to achieve context sensitivity with the environments of Maricopa County.

The following is a brief description with photo examples for each of the flood protection methods.

## Non-Structural Method



The non-structural method of flood protection employs the use of regulatory mechanisms such as erosion control setback zones and zoning regulations as mechanisms for providing flood protection. This method is characterized by an absence of structural elements or features for flood protection. Exceptions may include provision of low standard road facilities for carrying out flood control monitoring, operations and maintenance activities. Natural drainage features such as rivers, washes, and arroyos perform the function of storm water conveyance. Interior

valleys and playas perform the function of storm water storage. Natural ridges often perform the function of flood water retardation and containment. The existing character of the landscape is usually preserved under this method. This method will usually complement, and achieve context sensitivity with, the visual character of most landscape settings.

## Soft Structural Method



The soft structural method includes construction of large scale flood protection structures such as conveyance channels, storage basins and flood retarding structures. The superstructure is constructed of earthen materials and the overall form of the structure is designed to emulate the character of natural landforms found in the surrounding landscape (Character Type). Hard structural components are either absent, buried, concealed or designed to blend with, and minimize, their visibility in the landscape. Additionally, the soft structural method incorporates

landscape architectural design themes, features and materials that are designed to complement the valued character of natural, pastoral, rural and suburban landscape settings in which these structures are located. This method also includes right of way to provide an adequate landscape setback to enable the structure to visually blend with, and complement, adjacent land use areas. The soft structural method also offers significant potential for enhancing heavily built environments such as the suburban, urban and industrial landscape settings through the preservation or restoration of natural landscapes or introduction of developed open spaces within these settings.

## Semi-Soft Structural Method



The semi-soft structural method includes construction of large scale flood control facilities constructed predominantly of earthen materials. The overall form of the superstructure is designed to emulate the character of natural landforms found in the surrounding landscape (Character Type). Structural components such as grade control structures, energy dissipaters, low flow features, inlets and outlets may be visually evident, but their overall form, color, texture and materials usage is designed to remain visually subordinate to, and complement, the valued character of the landscape settings in which they are located through careful placement,

materials usage, and landscape architectural design. This method also incorporates landscape architectural design themes, features and materials that complement the valued character of natural, pastoral, rural and suburban landscape settings in which flood control structures are located. This method also includes right of way to provide an adequate landscape setback to enable the structure to visually blend with and complement adjacent land use areas. As a result, this method can complement and achieve context sensitivity with a wide range of landscape settings in Maricopa County, including natural, pastoral, rural, suburban and urban landscapes. The semi-soft method also has a large potential for introducing positive variety into and enhancing heavily built environments.

### **Hard Structural Method with Aesthetic Treatment**



The hard structural method with aesthetic treatment includes construction of large scale flood control structures with superstructures that are fully, or partially, concrete-lined. Structural components are also typically constructed of hardened (concrete) materials. This method produces structures that stand out as visually dominant feature attractions within most urban and industrial landscape settings in Maricopa County. It incorporates landscape design themes, features and materials that complement the valued character of urban and industrial landscape settings. Examples of aesthetic treatments include gracefully

meandering the overall form of the superstructure, use of color, textural patterns, rustication techniques, urban art, other architectural embellishments and landscape plantings to establish visual and cultural context sensitivity primarily within urban and industrial settings. This method also includes right of way to provide an adequate landscape setback to enable these structures to visually blend with, and complement, adjacent land use areas. This method has a large potential for being viewed as a negative deviation that can detract from the valued character of natural, pastoral, rural and many suburban landscape settings.

### **Semi-Hard Structural Method**



The semi-hard structural method includes construction of large scale flood control structures constructed predominantly with earthen materials. These structures typically employ standard civil engineering design practices without inclusion of landscape architectural design or aesthetic features. The superstructure typically contains a geometric form, with uniform side slopes, bottom (invert) and over-bank areas. Component structures for grade control, energy dissipation inlets and outlets are characteristically standard engineering designs that do not incorporate

landscape architectural design or aesthetic features. Vegetation treatments are typically limited to those required for erosion and dust control or for meeting USACE 404 permitting requirements. Right of way for establishing a landscape setback is typically not included with this method. Except for rural and industrial landscapes, this method generally lacks the ability to complement the visual character of, and achieve context sensitivity with, the natural, pastoral, suburban and urban landscape settings in Maricopa County.

## Hard Structural Method



The hard structural method includes the construction of heavily armored large scale flood control structures and component structural features. The superstructure and component structures typically employ standard civil engineering design practices without inclusion of landscape architectural design or aesthetic treatments. The superstructure typically contains a strongly geometric form, with uniform profile, side slopes, bottom (invert) and over-bank areas. Component structures for grade control, energy dissipation, inlets and outlets are also characteristically

standard engineering designs that have a strongly geometric appearance. Vegetation planting is typically limited to the over-bank and/or perimeter area around the structure and only to the extent required for dust and erosion control or USACE 404 permitting requirements. Right of way for establishing a landscape setback is typically not included with this method. The hard structural method is usually only complementary to, and achieves context sensitivity with heavy industrial landscape settings within Maricopa County. Within other settings, this method has a large potential to introduce very strong negative deviations that will detract from the valued landscape character.

### 3.1.1 Existing Landscape Character Compatibility

Existing landscape character flood protection methods compatibility ratings were established by comparing the visual character of the flood protection methods with the visual character of the landscape character units found within Maricopa County in the District's LIA. From this comparison, each method was rated as either compatible or incompatible with the landscape character units. The flood protection methods compatibility ratings and resulting compatibility classes for the landscape character units found within the project study area are summarized in Table 11. The ratings reflect typical District applications of the flood protection methods. Incompatible ratings may, in some instances, be overcome through the application of special or extraordinary treatments and designs.

**TABLE 11 Existing Landscape Character Units  
Flood Protection Methods Compatibility Classes Matrix  
for the Siphon Draw Project Study Area**

Landscape Character Units	Flood Protection Methods					
	Non-Structural	Soft Structural	Semi-Soft Structural	Hard Structural w/ Aesthetic Treatment	Semi-Hard Structural	Hard Structural
Natural Valley Wash	C	IC	IC	IC	IC	IC
Rural Valley Wash	C	IC	IC	IC	IC	IC
Suburban Valley Wash	C	IC	IC	IC	IC	IC
Urban Valley Wash	C	IC	IC	IC	IC	IC
Industrial Valley Wash	C	IC	IC	IC	IC	IC
Natural Valley Plain	C	C	C	IC	IC	IC
Rural Valley Plain						
Suburban Valley Plain						
Urban Valley Plain	C*	C*	C*	C	IC	IC
Industrial Valley Plain	C*	C*	C*	C	C	C^

\*Also achieves compatibility through the introduction of positive visual variety that enhances the character of the landscape setting.  
^Hard structures are incompatible when adjacent to, or visible from, an adjacent LCU that is incompatible with a hard structure or when located within an industrial park.

The compatibility class matrix and the Existing Landscape Character Units Map were utilized in GIS to produce an Existing Landscape Character Flood Protection Methods Compatibility Classes map for Maricopa County in the District's LIA. The Compatibility Classes found within the Siphon Draw project study area are summarized in Table 12 and are shown on the map in Figure 3-1.

Approximately 3% of the project area, consisting of the existing Valley Wash landscape character units, is designated as Compatibility Class 1. Hence, only the Non-Structural Method is context sensitive with these landscape character units. The majority of the Siphon Draw Study Area is categorized with Compatibility Class 3 and is compatible with the non-structural, soft-structural and the semi-soft structural flood protection methods. About 2% of the project area is designated as Compatibility Class 4. This designation is limited to the Urban landscape settings within the project study area. Approximately 16% of the project area is designated as Compatibility Class 6 and is compatible with all six flood protection methods. The Compatibility Class 6 designations are limited to the Industrial Valley Plains landscape character unit.

**TABLE 12 Summary of Existing Landscape Character Flood Protection Methods Compatibility Classes for the Siphon Draw Project Study Area**

Compatibility Class	Acres	% of Study Area
Class 1	918	3
Class 3	24,259	79
Class 4	539	2
Class 6	4,848	16

### **3.1.2 Planned Future Landscape Character Compatibility**

The District also applied the above described methodology to the Planned Future Landscape Character Units in the countywide LIA. The Planned Future Landscape Character Flood Protection Methods Compatibility Classes within the Siphon Draw project study area are summarized in Table 13 and illustrated on the map in Figure 3-2.

As with Existing Landscape Character Compatibility, approximately 3% of the project area, consisting of the Valley Plains Wash landscape character units, will remain designated as Compatibility Class 1 and is context sensitive only with the Non-Structural Method. Compatibility Class 3 areas will decline by approximately 10% but will still comprise the majority of the project study area. The Compatibility Class 4 areas will increase to 10% and areas designated with Compatibility Class 6 will increase to approximately 17% of the project study area.

**TABLE 13 Summary of Planned Future Landscape Character Flood Protection Methods Compatibility Classes Found in the Siphon Draw Project Study Area**

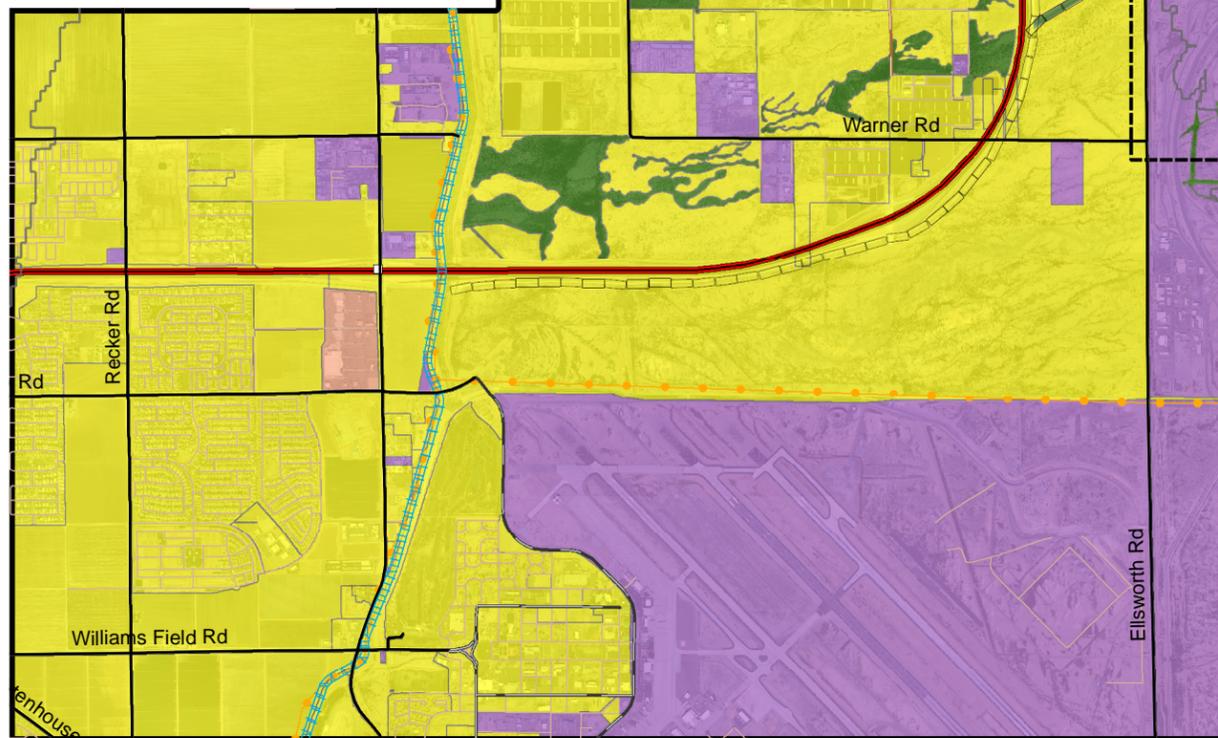
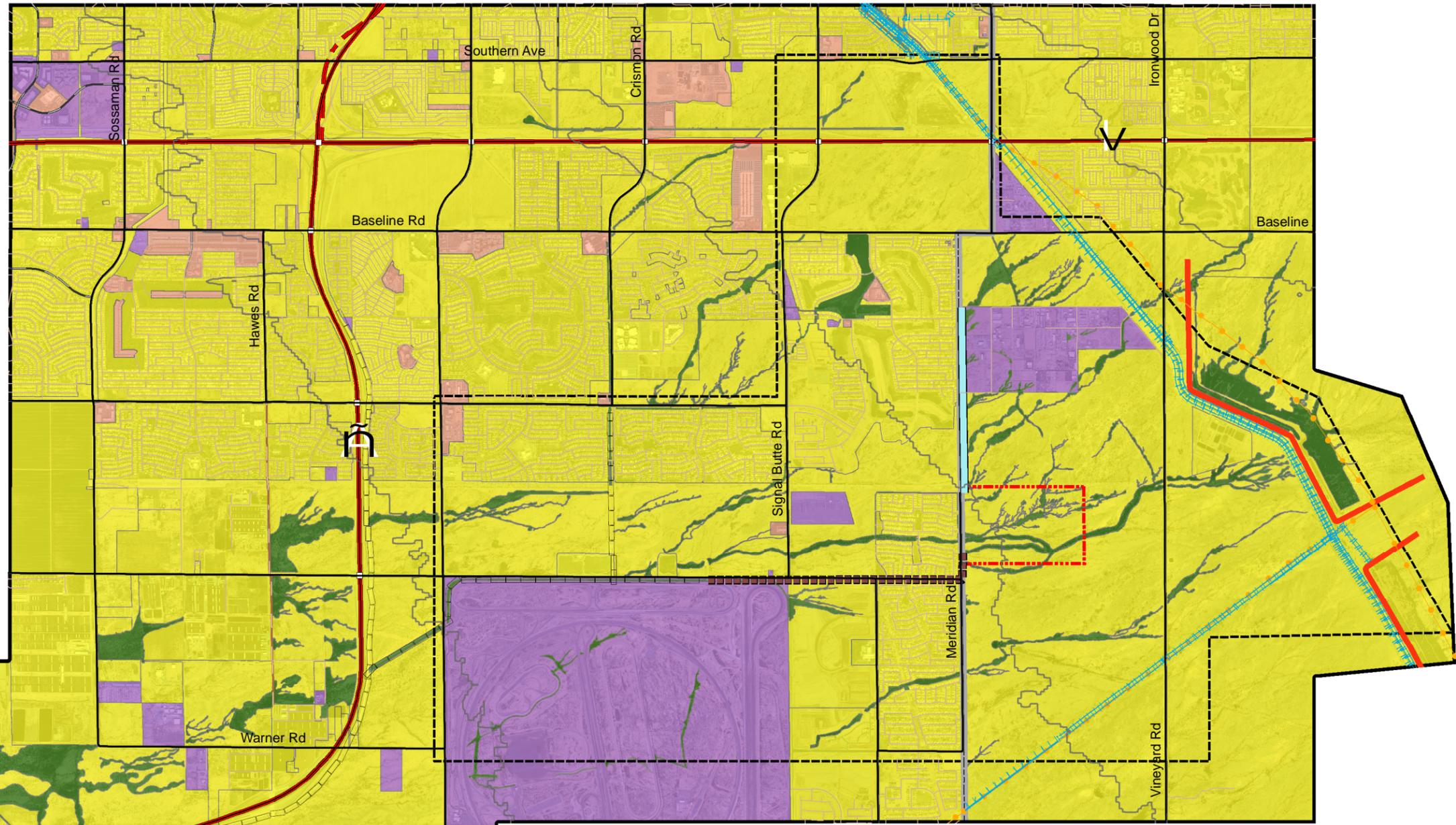
Compatibility Class	Acres	% of Study Area
Class 1	918	3
Class 3	21,096	70
Class 4	3,377	11
Class 6	5,159	16

**EXISTING LANDSCAPE CHARACTER FLOOD PROTECTION METHODS COMPATIBILITY**

- CLASS 1
- CLASS 3
- CLASS 4
- CLASS 6

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



**Siphon Draw Drainage Improvements Project**

**REFERENCE FEATURES**

- Study Boundary
- Project Boundary
- County Boundary
- Freeways
- Arterials
- Dam
- 100 Foot Contours
- Maricopa Trails
- Canals

0 0.35 0.7 1.4 2.1 2.8 Miles

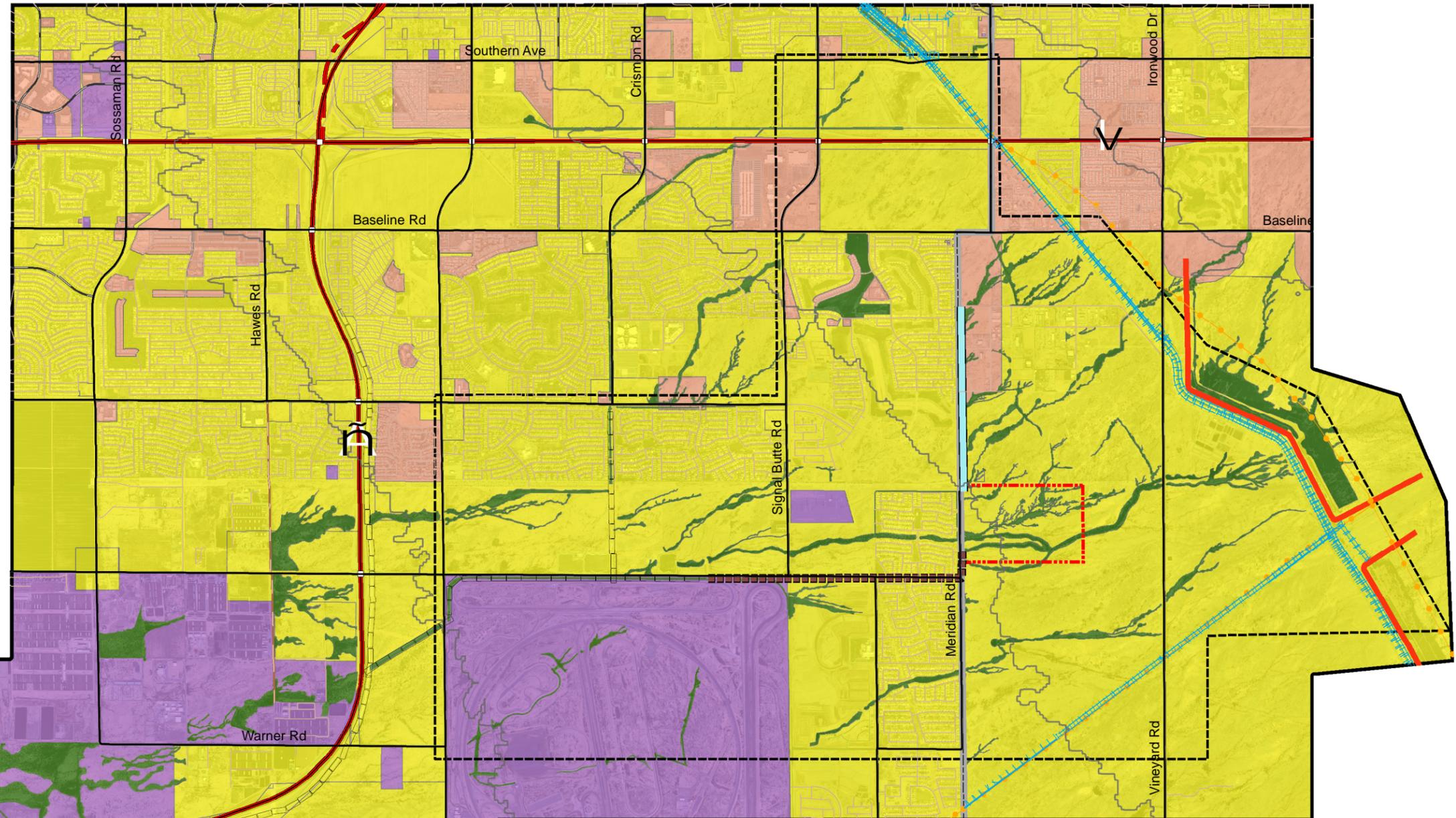
Figure 3-1

**FUTURE PLANNED  
LANDSCAPE  
CHARACTER FLOOD  
PROTECTION METHODS  
COMPATIBILITY**

- CLASS 1
- CLASS 3
- CLASS 4
- CLASS 6

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> Study Boundary	<span style="display: inline-block; border-bottom: 1px solid red; width: 20px; margin-right: 5px;"></span> Freeways	<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> 100 Foot Contours
<span style="display: inline-block; border-bottom: 1px dashed black; width: 20px; margin-right: 5px;"></span> Project Boundary	<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> Arterials	<span style="display: inline-block; border-bottom: 1px dashed orange; width: 20px; margin-right: 5px;"></span> Maricopa Trails
<span style="display: inline-block; border-bottom: 1px dashed gray; width: 20px; margin-right: 5px;"></span> County Boundary	<span style="display: inline-block; border-bottom: 1px solid red; width: 20px; margin-right: 5px;"></span> Dam	<span style="display: inline-block; border-bottom: 1px dashed cyan; width: 20px; margin-right: 5px;"></span> Canals

0    0.35    0.7    1.4    2.1    2.8 Miles

Figure 3-2

**3.1.3 Parks and Open Space Flood Protection Methods Compatibility**

Parks and Open Space flood protection methods compatibility ratings provide an indication of the range of flood protection methods that are expected to complement the types recreation activities services and experiences provided by the different kinds of parks, recreation uses and open spaces identified in the inventory.

Each of the categories of parks, recreation areas and open spaces identified in the District's countywide LIA were evaluated for their compatibility with the six flood protection methods. Each method was then rated as either compatible or incompatible. The compatibility ratings were developed based upon a correlation of (1) the recreation management direction, types of recreation experiences provided, or expected to be provided; (2) the types and levels of development and landscape alteration that is typically associated with each of the flood protection methods as reflected in narrative descriptions and photo examples of the methods; and (3) The Character of the landscapes that are typically associated with each type of park or open space resource in the inventory.

The compatibility ratings and resulting compatibility classes for the parks, recreation areas and open space resources located within the Siphon Draw project study area are summarized in the Table 14.

**TABLE 14 Parks and Open Space Resources Flood Protection Methods Compatibility Classes Matrix for the Siphon Draw Project Study Area**

Parks, Recreation Areas and Open Space Resources	Flood Protection Methods Compatibility Classes					
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
	Non-Structural	Soft Structural	Semi-Soft Structural	Hard Structural w/ Aesthetic Treatment	Semi-Hard Structural	Hard Structural
<b>Regional</b>						
MAG Retention Open Space Areas	C	C	C	IC	IC	IC
<b>Local</b>						
Suburban City Parks	C	C	C	IC	IC	IC
Golf Courses	C	C	C	IC	IC	IC

The flood protection methods compatibility matrix for parks, recreation areas and open spaces was utilized by the District in GIS to produce a Parks, Recreation Areas and Open Spaces Flood Protection Methods Compatibility Class map for Maricopa County in its LIA.

Figure 3-3 shows the mapping of these compatibility classes within, and adjacent to, the Siphon Draw project study area. Compatibility Classes were only assigned to areas situated within designated parks, recreation areas and open spaces. The parks, recreation and open space resources, which comprise approximately 3% of the study area, are designated as Compatibility Class 3. The remainder of the project study area is not assigned a flood protection methods compatibility class.

### PARKS AND OPEN SPACES FLOOD PROTECTION METHODS COMPATIBILITY

CLASS 3

**Trail Corridors**

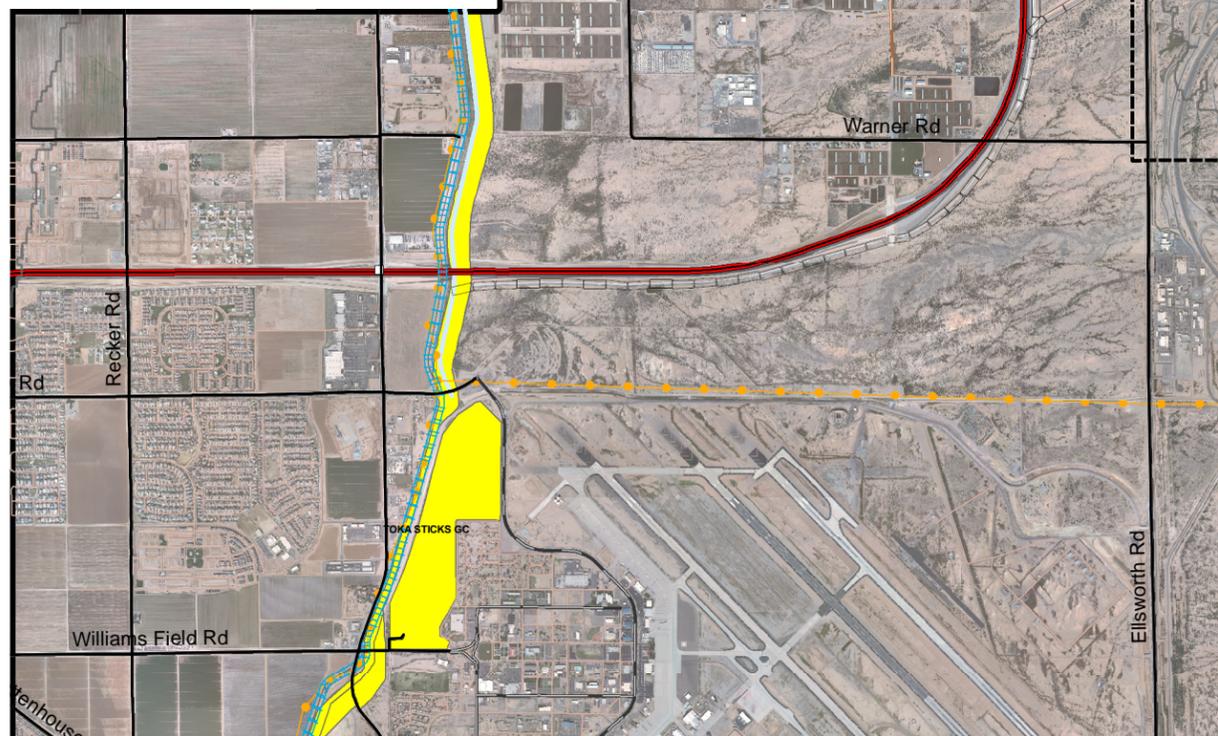
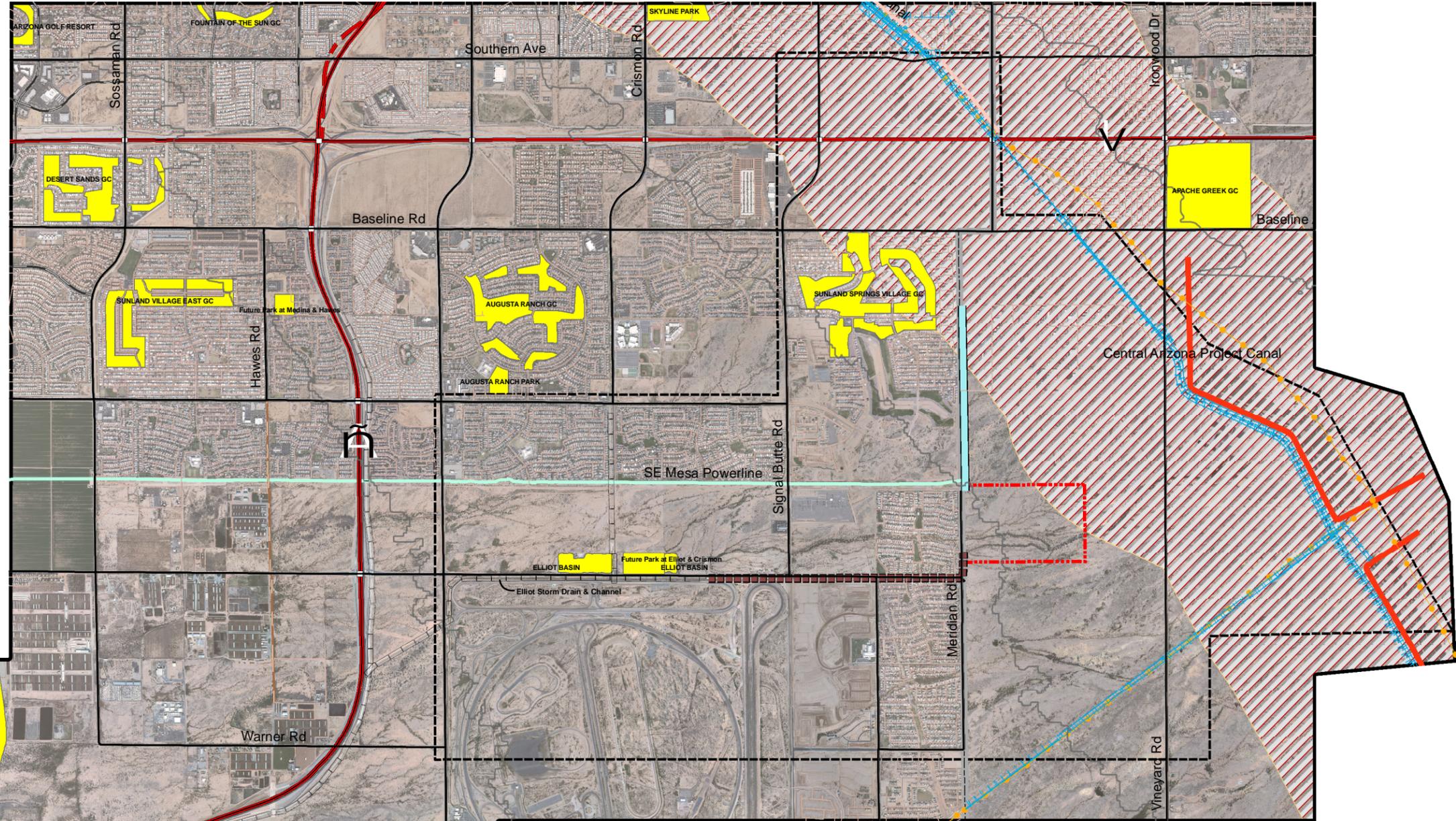
- CAP Canal Brown to Meridian
- RWCD Canal
- SE Mesa Powerline
- Maricopa Regional Trail

**Wildlife Linkage Corridor**

- Central Arizona Project

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

<span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span> Study Boundary	<span style="display: inline-block; width: 20px; border-bottom: 1px solid red; margin-right: 5px;"></span> Freeways	<span style="display: inline-block; width: 20px; border-bottom: 1px solid gray; margin-right: 5px;"></span> 100 Foot Contours
<span style="display: inline-block; width: 20px; border-bottom: 1px dashed black; margin-right: 5px;"></span> Project Boundary	<span style="display: inline-block; width: 20px; border-bottom: 1px solid black; margin-right: 5px;"></span> Arterials	<span style="display: inline-block; width: 20px; border-bottom: 1px dashed cyan; margin-right: 5px;"></span> Canals
<span style="display: inline-block; width: 20px; border-bottom: 1px dashed gray; margin-right: 5px;"></span> County Boundary	<span style="display: inline-block; width: 20px; border-bottom: 1px solid red; margin-right: 5px;"></span> Dam	

0    0.35    0.7    1.4    2.1    2.8 Miles

Figure 3-3

**3.1.4 Combined Existing Resource Flood Protection Methods Compatibility**

A Combined Existing Resources Flood Protection Methods Compatibility Class map was produced by the District in its LIA. This map was produced by overlaying and merging in GIS the compatibility class maps for Existing Landscape Character Units and Parks, Recreation Areas and Open Spaces. The most restrictive compatibility class was given preference in the process of merging these maps. The map in Figure 3-4 displays the Combined Existing Resource Compatibility Classes for the Siphon Draw project study area. Table 15 contains a summary of the acreages for these compatibility classes.

**TABLE 15 Summary of Combined Existing Resources Flood Protection Methods Compatibility Classes in the Siphon Draw Project Study Area**

<b>Compatibility Class</b>	<b>Acreage</b>	<b>Percent of Total</b>
Compatibility Class 1	918	3
Compatibility Class 3	24,263	80
Compatibility Class 4	538	2
Compatibility Class 6	4,847	15

The Combined Existing Resource Flood Protection Methods Compatibility Class map is the tool that is recommended for use in designing context sensitive alternatives for the Siphon Draw Drainage Improvements Project.

**3.1.5 Combined Future Planned Resources Flood Protection Methods Compatibility**

The District has also produced a Combined Future Planned Resources Compatibility Class map for Maricopa County in its LIA. This map was produced in GIS by merging the compatibility class maps for the Planned Future Landscape Character Units and Parks and Open Spaces. Table 16 summarizes the acreage results of this mapping within the Siphon Draw project study area. The map in Figure 3-5 displays the delineation of these compatibility classes within the project study area.

**TABLE 16 Summary of Combined Future Planned Resources Flood Protection Methods Compatibility Classes in the Siphon Draw Project Study Area**

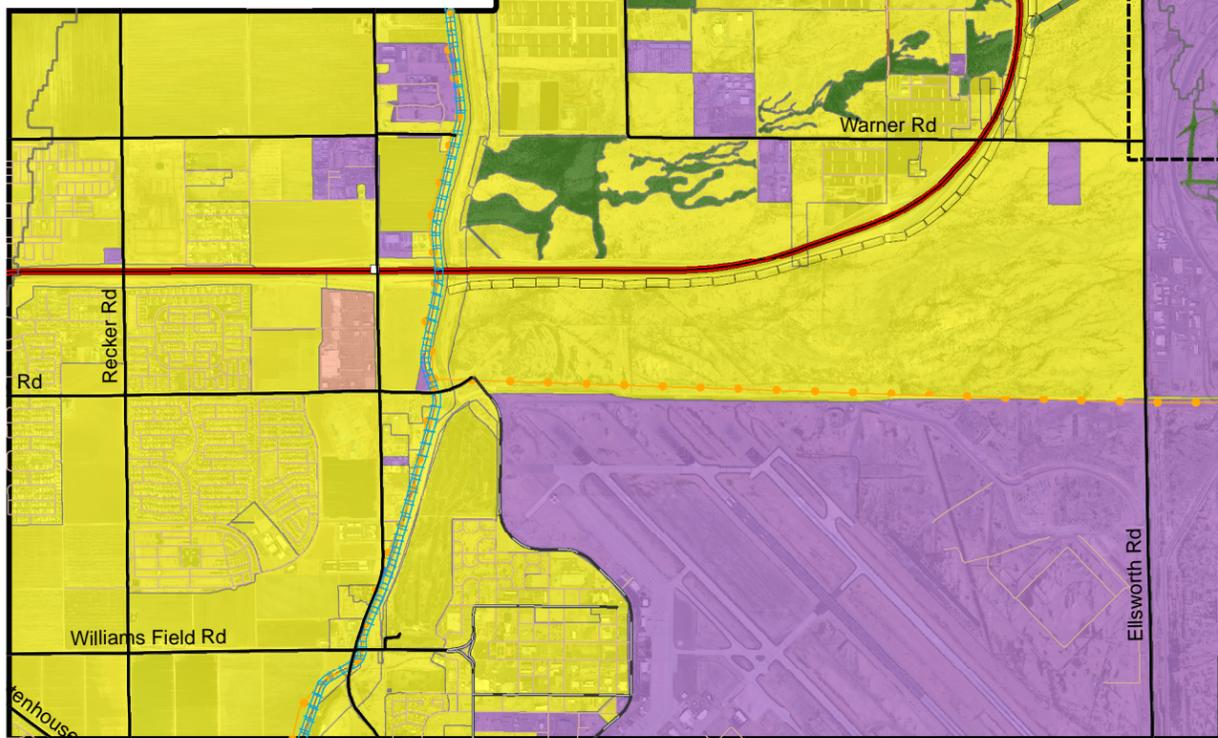
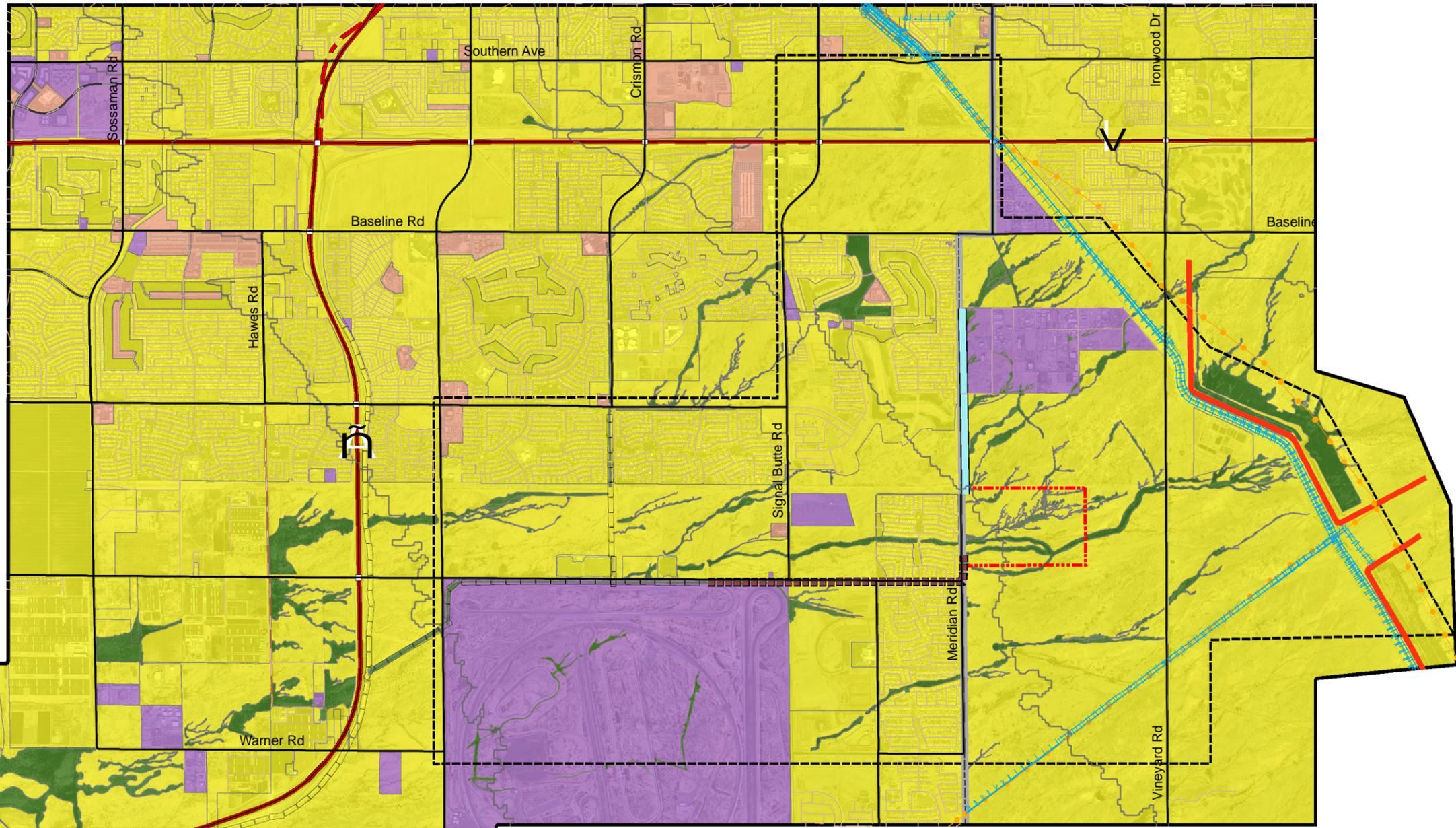
<b>Compatibility Class</b>	<b>Acreage</b>	<b>Percent of Total</b>
Compatibility Class 1	918	3
Compatibility Class 3	21,402	70
Compatibility Class 4	3,133	10
Compatibility Class 6	5,113	17

**COMBINED EXISTING RESOURCE FLOOD PROTECTION METHODS COMPATIBILITY**

- CLASS 1
- CLASS 3
- CLASS 4
- CLASS 6

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain



**Siphon Draw Drainage Improvements Project**

**REFERENCE FEATURES**

- Study Boundary
- Project Boundary
- County Boundary
- Freeways
- Arterials
- Dam
- 100 Foot Contours
- Maricopa Trails
- Canals

0 0.35 0.7 1.4 2.1 2.8 Miles

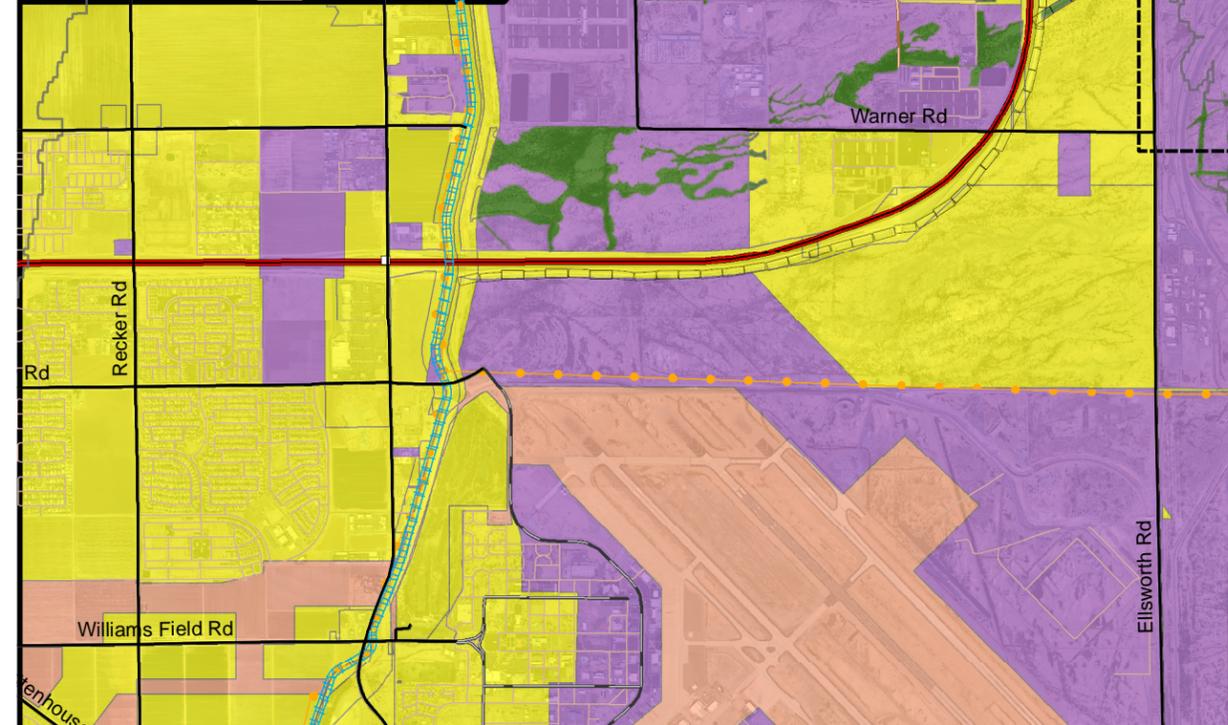
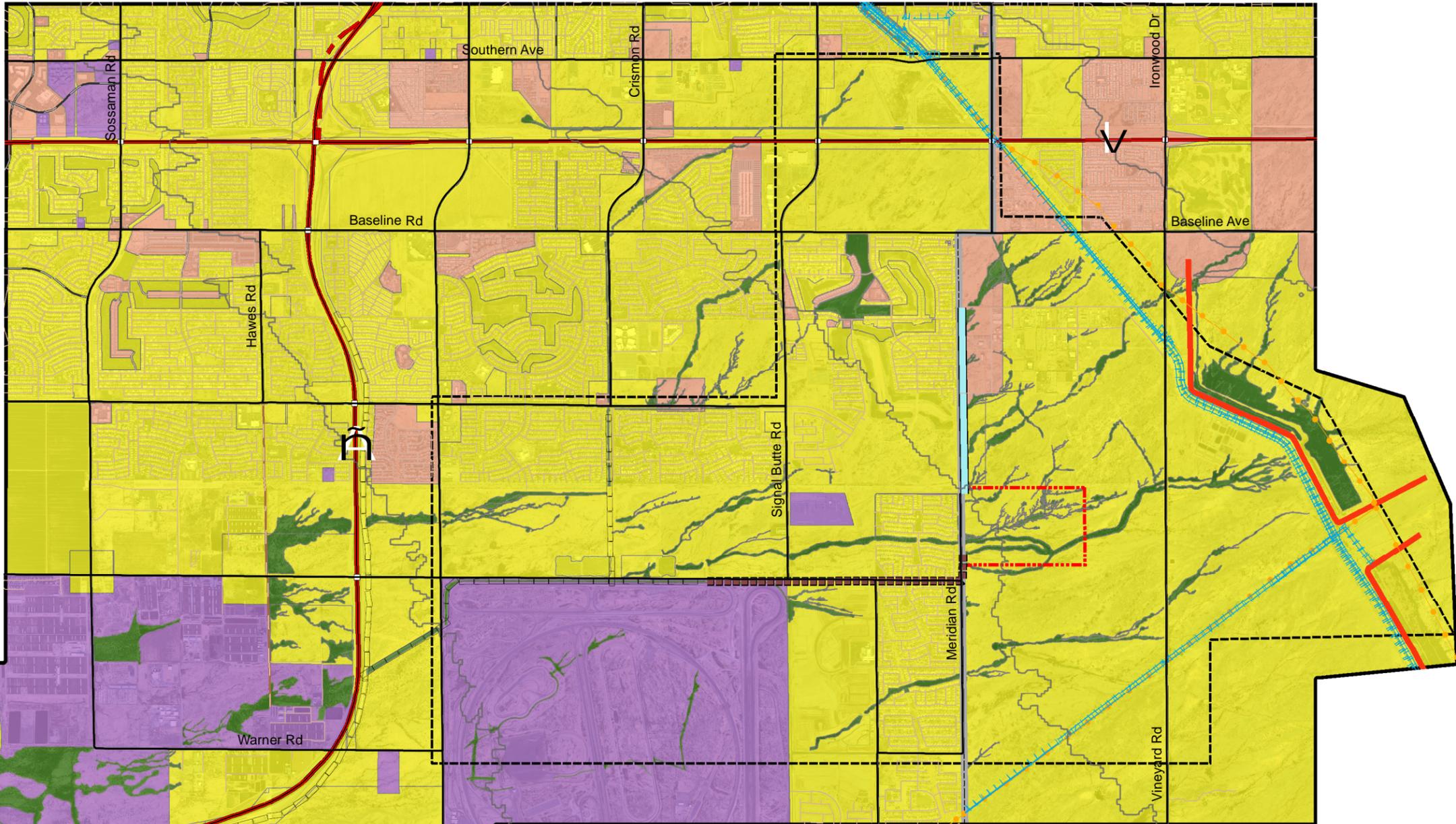
Figure 3-4

### COMBINED FUTURE PLANNED RESOURCE FLOOD PROTECTION METHODS COMPATIBILITY

- CLASS 1
- CLASS 3
- CLASS 4
- CLASS 6

**Project Components**

- Basin Site
- Existing Channel / Storm Drain
- Open Channel
- Proposed Storm Drain





## Siphon Draw Drainage Improvements Project

**REFERENCE FEATURES**

<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> Study Boundary	<span style="display: inline-block; border-bottom: 1px solid red; width: 20px; margin-right: 5px;"></span> Freeways	<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> 100 Foot Contours
<span style="display: inline-block; border-bottom: 1px dashed black; width: 20px; margin-right: 5px;"></span> Project Boundary	<span style="display: inline-block; border-bottom: 1px solid black; width: 20px; margin-right: 5px;"></span> Arterials	<span style="display: inline-block; border-bottom: 1px dashed orange; width: 20px; margin-right: 5px;"></span> Maricopa Trails
<span style="display: inline-block; border-bottom: 1px dashed gray; width: 20px; margin-right: 5px;"></span> County Boundary	<span style="display: inline-block; border-bottom: 1px solid red; width: 20px; margin-right: 5px;"></span> Dam	<span style="display: inline-block; border-bottom: 1px dashed cyan; width: 20px; margin-right: 5px;"></span> Canals

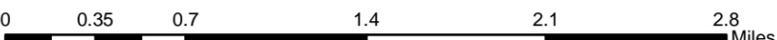




Figure 3-5

## 3.2 Landscape Design Themes

The identification of landscape design themes based upon the character of the landscape is an important early step in the planning and design of flood control facilities to achieve context sensitivity with the visual environments of Maricopa County.

Landscape design themes identify the desired overall “look” for flood control projects for specific landscape settings. The landscape design theme, as intended herein, is a visual design concept that is established to unify the visual appearance of flood control projects with the visual character of their surrounding landscape settings. Landscape design themes also serve as a basis for establishing a cohesive set of landscape design guidelines for project design that address appropriate scale, landform grading, plant materials selection and arrangement, and use of other materials, forms, colors and textures, to achieve the desired appearance.

The District has identified 10 landscape design themes for possible application to flood control solutions within the Sonoran Desert Landscape Character Type in Maricopa County in its *Landscape Design Themes handbook, July 27, 2007*. These themes were identified based upon the physical and visual characteristics of the landscape units found within the Character Type. Eight of these themes may be applicable to proposed flood control solutions within the Siphon Draw project study area based upon the landscape character units that are found therein. These eight themes include:

1. Natural Lower Sonoran Desert
2. Natural Lower Sonoran Desert Riparian
3. Natural Sonoran Desert Hydro Riparian
4. Semi-Natural Sonoran Desert
5. Enhanced Desert
6. Desert Park
7. Desert Oasis
8. Desert Plaza

The first three themes apply to natural, rural and industrial settings. The next five themes apply primarily to suburban and urban desert settings, and the last theme usually will apply only to urban settings. A brief description of each landscape design theme along with photo examples follows.

## Natural Lower Sonoran Desert Theme



- This theme emulates the visual characteristics of natural settings found within the valley floor of the Sonoran Desert.
- Flood control channels and basins are sized and shaped to replicate the scale of landforms and secondary drainage features found within the Valley Lands landscape character subtype and may include landscape berms and other topographic features to control the apparent size of flood control structures.
- The overall form of flood control structures is designed to accentuate natural landforms and vegetation patterns found within the subtype.
- Plant palette includes plant species that are visually prominent within the Lower Sonoran Desert, of which the signature species include Mesquite, Bursage and Creosote.
- Plant densities and arrangements replicate the densities and patterns that are characteristic within the subtype.
- This theme is context sensitive only within the valley plains physical setting in Maricopa County.

## Natural Lower Sonoran Desert Riparian Theme



- This theme emulates the visual character of natural desert washes that traverse the valley floor of the Sonoran Desert.
- Flood control channels and storage basins are sized and configured to replicate the scale and accentuate the form of drainage features found in the Valley Lands landscape character subtype.
- Their overall form typically replicates the dendritic drainage patterns and may include small islands and gravel bars similar to those found within the subtype.
- Plant palette includes plant species that are prominent along natural washes and other drainage features within the subtype, of which Mesquite and Willow are signature species.
- Plant materials are combined and arranged to form bosques and other natural patterns that are typically associated with the drainage features found in this subtype.
- This theme is context sensitive with all of the physical settings of the valley lands and river lands landscape character subtypes in Maricopa County.

## Natural Sonoran Desert Hydro-Riparian Theme



- This theme emulates the visual character of rivers, washes and arroyos found within the Sonoran Desert that are wet year round.
- Flood control channels and storage basins are sized and configured to replicate the scale and accentuate the form of drainage features found in the River Lands landscape character subtype.
- Bottom areas are designed to replicate the variety of physical conditions and flow characteristics found within the rivers of the subtype and typically will include a natural appearing low flow feature along with a variety of sand, gravel, cobble, boulders, bars and terraces.
- Plant palette includes plant species that make up the Lower Sonoran Desert Hydric Riparian native plant community, of which Cottonwood and Willow galleries are a signature feature.
- Plant materials are arranged to replicate the densities and patterns that naturally occur within the subtype.
- This theme is context sensitive with all landscape settings within the Sonoran Desert Landscape Character Type in Maricopa County.

## Semi-Natural Sonoran Desert Theme



- This theme is a variant of any of the preceding natural themes.
- Flood control channels and basins are sized and configured to replicate the scale of natural landforms, vegetation patterns and drainage features found within the Sonoran Desert landscape character type and/or the scale of open space features typically associated with suburban and rural residential settings within the character type.
- The overall form of flood control structures accentuates and exaggerates the forms of natural topographic and drainage features found in the character type to provide additional landscape variety and visual interest.
- Plant palettes typically consist of signature species and other plant materials associated with the landscape character subtype within which flood control facilities are located.
- The number and density of signature plant species is significantly increased to create an enhanced and more prominent natural appearance.
- This theme is context sensitive with all physical and cultural settings within the Sonoran Desert character type where a natural appearance with increased visual variety is desired.

## Enhanced Desert Theme



- This theme is also a variant of any of the preceding natural themes that emphasizes extensive use of inert gravel materials and an open arrangement of plant materials with a managed appearance.
- Flood control channels and basins are sized and configured to replicate the scale of natural landforms, vegetation patterns and drainage features found within the Sonoran Desert landscape character type and the scale of open space and predominant structural features found within the suburban and rural residential settings within the character type.
- The overall form of flood control structures accentuates and exaggerates the forms of natural topographic and drainage features found in the character type to create additional landscape variety and visual interest.
- Surface treatments typically involve extensive use of decomposed granite gravels and other natural inert materials in combination with a variety of native and desert adapted plant species.
- Plant materials and inert materials are arranged to create interesting variety in forms, patterns and spaces, accentuate the topographic forms of the structure, reinforce gateways, enframe views, provide shade and to screen discordant features from view.
- This theme is context sensitive with suburban, urban and industrial settings and transportation corridors in Maricopa County where an enhanced natural appearance is desired.

## Desert Park Theme



- This theme is a combination of the Enhanced Desert and Desert Oasis Themes.
- Flood control channels and basins are sized and configured to be in scale with the size of open spaces and structural features that are typically found within the surrounding suburban and rural residential settings.
- The overall form of flood control structures accentuates and exaggerates the forms of natural topographic and drainage features found in the character type to create additional landscape variety and visual interest.
- Surface treatments typically include a combination of turf and gravel pavements with both native and desert adapted canopy trees and palms that provide a more lush and green appearance than the previously described themes.
- Plant materials and inert materials are arranged to create interesting variety in forms, patterns and spaces, accentuate the topographic forms of the structure, reinforce gateways, enframe views, provide shade and to screen discordant features from view.
- This theme is context sensitive with suburban, urban and industrial cultural settings within the Sonoran Desert landscape character type.

## Desert Oasis Theme



- This theme emphasizes a park-like appearance with an emphasis on turf and canopy trees.
- Flood control channels and basins are sized and configured to be in scale with the size of open spaces and structural features that are typically found within the surrounding suburban and rural residential settings.
- The overall form of flood control structures accentuates and exaggerates the forms of natural topographic and drainage features found in the character type to create additional landscape variety and visual interest.
- Surface treatments typically are turf with both native and desert adapted canopy trees and palms.
- Plant materials and inert materials are arranged to create interesting variety in forms, patterns and spaces, accentuate the topographic forms of the structure, reinforce gateways, enframe views, provide shade and to screen discordant features from view.
- This theme is context sensitive with suburban, urban and industrial cultural settings within the Sonoran Desert landscape character type.

## Desert Plaza Theme



- This theme emphasizes extensive use of architecturally designed hardened materials with plant materials serving mainly as visual accents.
- Flood control facilities are sized and configured to be in scale with the structural features and spaces that are typically found within the surrounding urban setting.
- The overall form of flood control structures is inspired by the physical characteristics of drainage features found within the Sonoran Desert Character Type and often accentuates and exaggerates the scale and variety of those characteristics in abstract forms, colors and textures to create additional landscape variety and visual interest.
- Surface treatments predominantly consist of architecturally designed hardscape materials in a variety of colors, textures, patterns and special design motifs.
- Plant materials include a variety of native and introduced species that are employed for special effects, shade and spatial definition.
- This theme is context sensitive primarily with urban settings in Maricopa County.

### 3.2.1 Landscape Design Themes Application

The District's *Landscape Design Themes Handbook* identifies the level of applicability of the landscape design themes to the landscape character units identified in the Existing Landscape Character Assessment for Maricopa County. Three applicability ratings are utilized. They include:

#### **Applicable**

The theme is fully context sensitive with the visual character of the landscape Character unit.

#### **Occasionally Applicable**

The theme has limited ability for achievement of context sensitivity with the visual character of the landscape character unit. Occasionally applicable themes may be used in combination with an applicable landscape theme and should be limited to a maximum of 25% of the area for which they are occasionally applicable.

#### **Not Applicable**

The theme is not applicable because it is not context sensitive with the visual character of the landscape character unit.

Table 17 contains the Landscape Design Themes applicability ratings for the landscape character units that are found within the Siphon Draw project study area. The applicability ratings in the table were assigned based upon the ability of the themes to achieve context sensitivity with the landscape character units. The applicability ratings for the natural landscape character units were established based primarily upon the characteristics of the physical settings component. The applicability ratings for the remainder of the landscape character units were based primarily upon the characteristics of the cultural settings component.

When using Table 17 to identify and select context sensitive landscape design themes for specific projects, consideration should be given to the character of the existing cultural setting as well as the cultural setting that is expected to occur within the next ten years.

**Table 17 Application of Landscape Design Themes to the Landscape Character Units Found in the Siphon Draw Project Study Area**

<b>Sonoran Desert Landscape Character Type</b>	Natural Lower Sonoran Desert	Natural Lower Sonoran Desert Riparian	Natural Sonoran Desert Hydro Riparian	Semi-Natural Sonoran Desert	Enhanced Desert	Desert Park	Desert Oasis	Urban Plaza
Natural Valley Plain	A	A	A	A	NA	NA	NA	NA
Rural Valley Plain	A	A	A	A	NA	NA	NA	NA
Suburban Valley Plain	A	A	A	A	A	A	A	OA
Urban Valley Plain	A	A	A	A	A	A	A	A
Industrial Valley Plain	A	A	A	A	A	A	A	NA
Natural Valley Wash	NA	A	A	A	NA	NA	NA	NA
Rural Valley Wash	NA	A	A	A	NA	NA	NA	NA
Suburban Valley Wash	NA	A	A	A	A	A	A	OA
Industrial Valley Wash	NA	A	A	A	A	A	A	NA

Key: A = Applicable    OA = Occasionally Applicable    NA = Not Applicable

### 3.3 Landscape Preservation Recommendations

Based upon the scenic importance of the wash features indicated in the assessment of Landscape Variety Classes in Section 2, every effort should be made to preserve, retain and enhance these distinctive features as a visual amenity for the local community.

### 3.4 Need for Context Sensitive Flood Control Solutions

The overall need for context sensitive flood control solutions is relatively high within the Siphon Draw project study area based upon the overall high concern for aesthetics and visual sensitivity of the project area identified in the assessment of visual sensitivity levels in Section 2.

### 3.5 Recommended Landscape Design Guidelines

The landscape design guidelines contained in the District's *Aesthetic and Multi-Use Design Guidelines for Flood Control Basins Channels* are recommended for application to the basin and channel structures that are planned as a part of the Siphon Draw Drainage Improvements Project. These guidelines are included in Appendix F of this report.

## **4. Appendices**

- A. References**
- B. Glossary**
- C. Key to the Landscape Character Units of Maricopa County**
- D. Existing Landscape Character Units Map for Maricopa County**
- E. Detailed Landscape Character Unit Descriptions**
- F. Recommended Landscape Design Guidelines**

# Appendix A

## References

## References

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# Appendix B

## Glossary of Terms

## GLOSSARY of Terms

**Aesthetics** - Generally, the study, science, or philosophy dealing with beauty and with judgments concerning beauty. In scenery management, it describes landscape that give visual and sensory pleasure.

**Attribute** - An inherent landscape characteristic, trait, or quality

**Balance** - Visual stability produced, and an equilibrium established in a landscape, by natural forces or human intervention

**Base Map** - The document that graphically records existing physical and administrative features of a given landscape

**Characteristic** - Qualities that constitute a character, that characterize a landscape; a distinguishing trait, feature, or quality; uniqueness; attribute

**Composition** - Assembly and organization of components in a work of art or such organization in the landscape

**Contrasts** - Diversity or distinction of adjacent parts. Effect of striking differences in form, line, color, or texture of a landscape.

**Cultural Element** - Attributes in a human-altered landscape; scenically positive cultural elements, most of which have historical backgrounds or nostalgic connotations. Examples include split-rail fences, stone walls, barns, orchards, hedgerows, and cabins.

**Desert Varnish** - A dark, shiny surface of manganese and iron oxides that characterizes many exposed rock surfaces in deserts

**Desired Landscape Character** - Appearance of the landscape to be retained or created over time, recognizing that a landscape is a dynamic and constantly change in community of plants and animals. Combination of landscape design attributes and opportunities, as well as biological opportunities and constraints.

**Distinctive** - Refers to extraordinary and special landscapes. These landscapes are attractive, and they stand out from common landscapes.

**Disturbance** - A discrete event, either natural or human induced, that causes a change in the existing condition of an ecological system.

**Dominance Elements** - In scenery management, the dominance elements are form, line, color and texture. They are the attributes that make up the landscape character.

**Form** - Structure, mass, or shape of a landscape or of an object. Landscape form is often defined by edges or outline of landforms, rockforms, vegetation patterns, or waveforms, or the enclosed spaces created by these attributes.

**Frame of Reference** - An area or framework against which various parts can be judged or measured.

**Harmony** - Combination of parts of a landscape into a pleasing or orderly whole. A state of agreement, congruity, or proportionate arrangement of form, line, color, and texture.

**Landform** - One of the attributes or features that make up the Earth's surface, such as a plain, mountain, or valley.

**Landscape** - An area composed of interacting ecosystems that are repeated because of geology, landform, soils, climate, biota, and human influences throughout the area. Landscapes are generally of a size, shape, and pattern, which are determined by interacting ecosystems.

**Line** - An intersection of two planes; a point that has been extended; a silhouette of form. In landscapes—ridges, skylines, structures, changes in vegetation, or individual trees and branches—may be perceived as line.

**Pastoral Landscape Character** - Landscape Character that has resulted from human activities, containing positive cultural elements such as historic conversion of native forests into farmlands, pastures, and hedgerows, plus some remnants of native forests.

**Texture** - Visual interplay of light and shadow created by variations in the surface of an object. Grain or nap of a landscape or a repetitive pattern of tiny forms. Visual texture can range from smooth to course.

**Variety** - An intermixture, diversity, or succession of different things, forms, or qualities in the landscape.

Following terminology originated in the USDA Forest Service Visual Management System.

**Landscape character** - Biological, physical and cultural factors interact to determine landscape character. Landscape character is an overall visual and cultural impression of landscape attributes – the physical appearance and cultural context of a landscape that gives it an identity and “sense of place.” Landscape character can be described in terms of visual dominance elements: line, form, color and texture, and landscape composition types<sup>1</sup>. Landscape character can be mapped at different scales.

**Landscape character type** - A landscape character type, also known as a landscape province, is a regional area of land that has similar distinguishing visual characteristics of landform, rock formations, water forms, vegetative communities and patterns of these landscape elements. An example of a character type is the “Sonoran Desert” of Arizona, extending from northwestern Sonora (Mexico) to southeastern California and southwestern Arizona (USA). The Tonto Character Type encompasses the mountainous area between the Mogollon Escarpment and Gila River. Maricopa County is located within two landscape character types.

**Landscape character subtype** - In some cases, a landscape character type is too broad or great in diversity of character to provide a logical frame of reference to classify physical features or cultural contexts. For such situations, each landscape character type may be further divided into smaller landscape character subtypes. Subtypes are significantly different in visual characteristics from each other. An example of a character subtype is found in Maricopa County, where the Tonto Character Type has been subdivided into two subtypes: the “Upper Tonto” and “Sonoran Arizona Uplands.” The Uplands are an area of rolling hills and low barren mountains within the Tonto Character Type. Elevations in this subtype range from 1500 to 3000 feet, with some peaks reaching over 5000 feet. Also within the Tonto Character Type, the Upper Tonto Subtype is an area of deeply dissected mountains including the Superstition, Pinal, Juniper, Bradshaw, Black Hills, Mazatzal, and Sierra Ancha mountain ranges.

**Landscape character unit** - Compared to a character type or subtype that classifies physiography and vegetation at a macro-scale, a landscape unit classifies attributes of landform, rockform, water form and vegetation at a finer scale. A landscape unit is an area of land that has similar distinguishing characteristics of physical and biological factors that combine to create its scenic expression or its unique meaning of “place.” Examples are a mountain-land, desert-plain, river wash, or canyon-land landscape unit.

**Landscape subunit** - Depending upon cultural features and human activities present on the land, each landscape unit can be divided into subunits. A landscape subunit is an area of land that has similar or identical distinguishing visual characteristics, based upon its combination of physical factors and cultural uses. For example, within a desert plain landscape unit, there could be many different land uses, such as urban, suburban, rural, or agricultural. Each is a different landscape subunit. A subunit may be located in numerous scattered locations and yet have identical visual attributes and landscape compositions. For instance, a cotton field in eastern Maricopa County may be identical visually to a cotton field in western Maricopa County. Additionally, a landscape subunit is often identifiable as a “special place,” such as Twin Peaks or Papago Peaks.

**Existing landscape character** - Existing landscape character is the current visual impression of landscape attributes, the physical appearance of a landscape that gives it a unique identity and “sense of place.” Existing landscape character in Maricopa County ranges from a natural landscape to one that is urban – from a pristine wilderness to a built environment. It is based on a unique combination of landform, rockform, vegetation, waterform and cultural elements. Existing landscape character may be identical in a number of widely scattered landscape units if those areas have similar physical characteristics and visual attributes of form, line, color and texture.

<sup>1</sup>Litton, R. Burton, Jr. 1968. Forest Landscape Description and Inventories – A Basis for Land Planning and Design. Research Paper PSW-49. USDA Forest Service. Berkeley, CA. 64 p.

# Appendix C

## Key to the Landscape Character Units of Maricopa County

# Key to the Landscape Character Units of Maricopa County

Prepared by Dennis Holcomb, Flood Control District of Maricopa County, January, 2002

Landscape Character Type	Landscape Character Subtype	Landscape Character Unit	
Sonoran Desert	Sonoran River Lands	Natural and Pastoral River Channel Rural River Channel Suburban River Channel Urban River Channel Industrial River Channel	
		Natural and Pastoral River Terrace Rural River Terrace Suburban River Terrace Urban River Terrace Industrial River Terrace	
	Sonoran Valley Lands	Natural and Pastoral Valley Plains Rural Valley Plains Suburban Valley Plains Urban Valley Plains Industrial Valley Plains	
		Natural and Pastoral Valley Rivers and Washes Rural Valley Rivers and Washes Suburban Valley Rivers and Washes Urban Valley Rivers and Washes Industrial Valley Rivers and Washes	
		Sonoran Mountains & Uplands	Natural and Pastoral Arroyo Suburban Arroyo
	Natural and Pastoral Bajada Rural Bajada Suburban Bajada Urban Bajada Industrial Bajada		
	Natural & Pastoral Volcanic Field Suburban Volcanic Field		
	Natural and Pastoral Foothills Rural Foothills Suburban Foothills Urban Foothills Industrial Foothills		
	Tonto	Sonoran Arizona Uplands	Natural and Pastoral Mountains Suburban Mountains Urban Mountains Industrial Mountains
			Natural and Pastoral Sonoran Arizona Uplands Rural Sonoran Arizona Uplands Suburban Sonoran Arizona Uplands Urban Sonoran Arizona Uplands Industrial Sonoran Arizona Uplands
Upper Tonto Natural and Pastoral Upper Tonto			

# Appendix D

## Existing Landscape Character Units Map for Maricopa County

# Landscape Character Assessment For Maricopa County

Prepared by  
Flood Control District of Maricopa County  
October 2005

## EXISTING LANDSCAPE CHARACTER UNITS

### TONTO CHARACTER TYPE

Sonoran Arizona Uplands Subtype	Upper Tonto Subtype
Natural and Pastoral Sonoran Arizona Uplands	Natural and Pastoral Upper Tonto
Rural Sonoran Arizona Uplands	Rural Upper Tonto
Suburban Sonoran Arizona Uplands	Suburban Upper Tonto
Industrial Sonoran Arizona Uplands	

### SONORAN DESERT CHARACTER TYPE

Sonoran River Lands Subtype	
Natural and Pastoral River Channel Unit	Natural and Pastoral River Terrace Unit
Rural River Channel Unit	Rural River Terrace Unit
Suburban River Channel Unit	Suburban River Terrace Unit
Urban River Channel Unit	Urban River Terrace Unit
Industrial River Channel Unit	Industrial River Terrace Unit

### Sonoran Valley Lands Subtype

Natural and Pastoral Valley Rivers and Washes Unit	Natural and Pastoral Valley Plains Unit
Rural Valley Rivers and Washes Unit	Rural Valley Plains Unit
Suburban Valley Rivers and Washes Unit	Suburban Valley Plains Unit
Urban Valley Rivers and Washes Unit	Urban Valley Plains Unit
Industrial Valley Rivers and Washes Unit	Industrial Valley Plains Unit

### Sonoran Mountain Lands Subtype

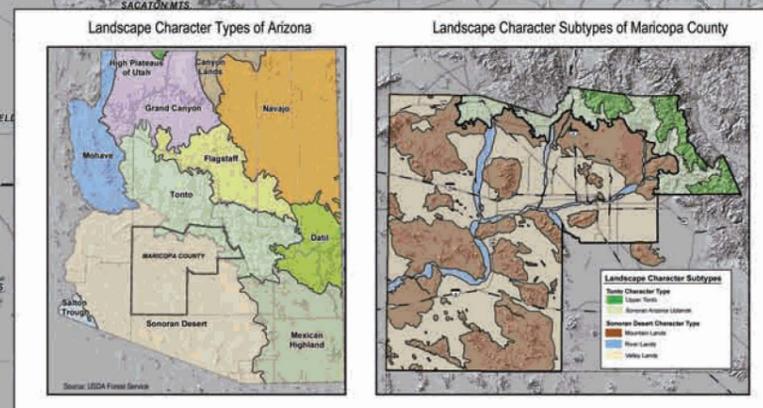
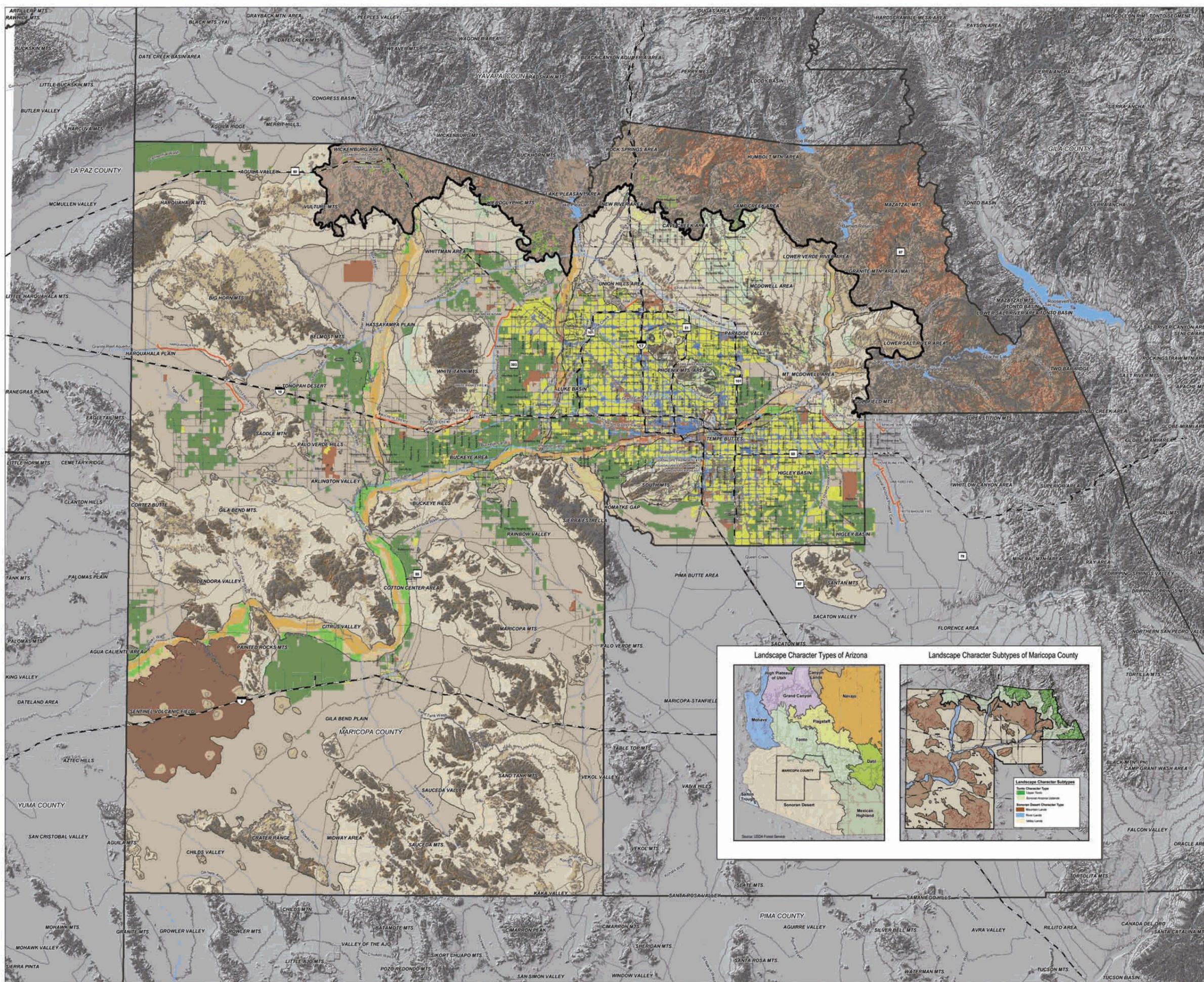
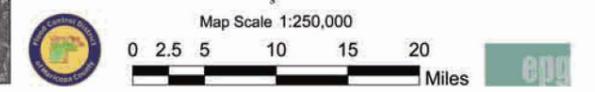
Natural and Pastoral Arroyo Unit	Suburban Foothills Unit
Rural Arroyo Unit	Urban Foothills Unit
Suburban Arroyo Unit	Industrial Foothills Unit
Urban Arroyo Unit	Natural and Pastoral Mountains Unit
Industrial Arroyo Unit	Rural Mountains Unit
Natural and Pastoral Bajada Unit	Suburban Mountains Unit
Rural Bajada Unit	Urban Mountains Unit
Suburban Bajada Unit	Industrial Mountains Unit
Industrial Bajada Unit	Natural and Pastoral Volcanic Field Unit
Natural and Pastoral Foothills Unit	Rural Volcanic Field Unit
Rural Foothills Unit	Suburban Volcanic Field Unit

### REFERENCE FEATURES

Character Type Boundary	200 Foot Contours
Subtype Boundary	Flood Control Structures
County Boundary	Canals
Interstate Highways	Rivers & Washes
State Highways	Lakes
Major Roads	

### DATA SOURCES

This map was prepared as part of an overall assessment of existing landscape character by the Flood Control District of Maricopa County, under contract C02004C034 with EPG, Inc., Phoenix Arizona. This map was produced using Geographic Information Systems (GIS) software, and GIS data supplied by the Flood Control District of Maricopa County. A detailed listing of the data sources and descriptions of the mapping units shown on this map area contained in the document titled: Preliminary Landscape Character Assessment for Maricopa County, Flood Control District of Maricopa County, June 30, 2003. For more information about this map, please contact the Flood Control District of Maricopa County/Landscape Architecture Branch at (602) 506-1501, or write to us at 2801 W. Durango Street, AZ, 85009.



# Appendix E

## Detailed Landscape Character Unit Descriptions

Note:

The landscape character Unit descriptions provided in this appendix were excerpted from the document titled *Preliminary Existing Landscape Character Assessment for Maricopa County, October 2, 2003*, prepared under contract for the Flood Control District of Maricopa County by EPG, Inc.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **NATURAL/PASTORAL VALLEY RIVERS AND WASHES LANDSCAPE UNIT**

The Valley River and Washes physical unit occurs in the Sonoran Valley Lands Subtype of Maricopa County. A large variety of wash types exist in Maricopa County and vary in width, depth, vegetation, and bank character. Notable Valley River and Washes that occur in the Sonoran Character Type include Jackrabbit, Forth of July, Deadman, Rainbow, Waterman, Skunk, Cave, and Queen creeks, and the Santa Cruz washes. These typically dry washes originate in the uplands of the Tonto Character Type and vary in character as they descend towards Sonoran River Lands. Typically, the Valley Rivers and Washes start out as wide channels punctuated with large boulders and surfaced with large river rock. As they head towards the Sonoran River Lands they become rather narrow and slightly more incised. The surface tends to be composed of sand rather than rocks and boulders. Adjacent to the Sonoran River Lands the washes exhibit somewhat of the same character as the river channel including vegetation types and the surface materials found in the channels (i.e., sand and gravel).

### **NATURAL FEATURES**

#### **Landform**

The landforms associated with the Valley River and Washes are subtle yet varied. The washes vary in width and depth depending on the adjacent soil compositions and proximity to the Arizona Uplands (e.g., the Tonto Character Type). For example, towards the middle of the Sonoran Valley Lands the soil tends to consist of compacted alluvium, sometime cemented together with lime forming caliche. The compaction and caliche result in very low erosion potential<sup>1</sup>. Therefore, most of the washes that occur towards the middle of the Valley/Plains Physical Division are narrow and shallow in character. Conversely, the washes with broad and deeper character tend to occur close to the uplands because of the associated higher annual precipitation amounts and higher erosion potentials. During the summer, moist air condenses over the highlands of the Tonto Character Type resulting in large thunderstorms with tremendous downpours. The massive volume of water and associated detritus created during the downpours are all channeled into the Valley River and Washes, resulting in erosion. Once the floodwaters reach a certain point in the Sonoran Valley Lands, they lose potential energy and evaporate into the dry desert air. For example, Cave Creek Wash is extremely wide (almost ½ mile) where it enters the Sonoran Character Type close to the Town of Cave Creek. By the time the wash reaches the middle of the Sonoran Valley Lands (around Thunderbird and Interstate 17), it narrows to about 100 feet wide. In either case, the washes tend to have shallow flat channels edged with broken soil or rock.

## **Vegetation**

Vegetation varies within the Valley Rivers and Washes based upon the proximity of the washes to adjacent vegetation communities. Generally, the washes create conditions that enable species that require higher amounts of moisture to grow and flourish at lower elevation. For instance, the saguaro, paloverde, and ironwood vegetation association typically associated with the Bajada Physical Division frequently expand out of the Bajada and down into the Valley/Plains via the washes. At the point the vegetation leaves the Bajada through the wash and the adjacent vegetation and composition is different, the community is termed xeriparian. Other notable species that may occur in this physical division include desert willow, desert broom, velvet mesquite, catclaw acacia, and ragweed. Cottonwood can occur in this physical division, especially when the washes are connected or adjacent to the Sonoran River Lands Subtype.

## **Water Form**

Although water was the primary element that etched this physical division out of the Valley/Plains, it is almost always absent from this landscape unit. The only time the washes flow with water is during and/or after summertime thunderstorms associated with the monsoon season. When flow does occur it is extremely violent, carrying soil, broken pieces of vegetation, and rocks of various sizes. The flow dissipates as quickly as it began, depositing all the materials it picked up during peak flow.

## **Rock Form**

Rock form exists in this landscape unit and is associated with volcanic regions or areas close to the Sonoran Mountain Lands. Water erodes away surface materials on the banks of the washes exposing either bedrock or boulders/outcrops associated with the Sonoran Mountain Lands. The highest occurrences of rock form within this physical division are associated with the washes immediately adjacent to the Tonto Character Type (e.g., Cave Creek).

## **VISUAL CHARACTERISTICS**

### **Form**

The forms associated with this physical division are the broad to narrow curvilinear u-shape channel. This form contrasts with the surrounding Valley/Plains physical divisions because of its meandering linear nature. Other potential forms of this physical division include the round to oblong forms of the rocks and boulders and the slight undulating forms of the surface (i.e., small sand bars). Vegetation, depending on the density, can add natural unrefined forms to the landscape.

### **Line**

Line is the predominant visual element found in this physical division because of the subtle nature of the other visual elements. The lines expressed by the rivers and washes are curvilinear in nature and contrast with the linear lines associated with the Valley/Plains physical division. The occurrence of vegetation adds vertical line to the landscape, resulting in variety and additional contrast to the landscape.

## **Color**

The colors associated with the Valley Rivers and Washes are characteristic of the Sonoran Desert. The vegetation exhibits a color palette of bright-greens to grays and splashes of pastels during the spring blooming season. The surface of the channel varies from the beige of sand to the gray and brown of decomposing organic matter. Generally, the colors of this physical division are similar to the rest of the Sonoran Desert, especially the Valley/Plains adjacent to the Bajada.

## **Texture**

The texture associated with this physical division varies from fine to coarse depending on the type of wash or valley river. For example, if the wash has a rocky character similar to where Cave Creek enters the Sonoran Desert Character Type, then the texture would be coarse because of the various sizes of rock and boulders. If the character is more like the sandy bottom of the Waterman Wash, which flows towards the Buckeye Hills, the texture is fine to medium. In both cases the occurrence of vegetation may add additional textures to the landscape depending on vegetation density and species type. For example, the occurrence of a dense community of desert broom would result in additional coarse textures whereas the occurrence of desert willows would result in more of a medium texture.

## **Scale**

The scale of the Valley Rivers and Washes are small relative to the other physical divisions that occur in the Sonoran Desert Character Type. This is especially true because it is recessed into the ground, which makes it seem even smaller.

## **Composition**

The linear nature of this physical division makes it a focal landscape. Additionally, if there is a stand of desert willow, for example, the landscape composition could be enclosed as well.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **RURAL VALLEY RIVER AND WASHES LANDSCAPE UNIT**

The curvilinear Valley Rivers and Washes physical division has been utilized for agricultural purposes for centuries. The soil adjacent to the washes is high in organic matter and provides excellent drainage, which are conditions conducive to agriculture. The rectilinear agricultural fields associated with the rural setting are located adjacent the curvilinear washes resulting in a landscape unit of contrasting line. In other situations the washes are channelized, resulting in a linear feature in a rectilinear landscape. The vegetation sometimes associated with the Valley Rivers and Washes exhibits medium to coarse textures, which contrast with the fine textures of the rural setting. All of these elements create a landscape full of contrasts and visual interests.

### **NATURAL FEATURES**

#### **Landform**

The landforms associated with the Valley River and Washes are subtle yet varied. The washes vary in width and depth depending on the adjacent soil compositions and proximity to the Arizona Uplands (e.g., the Tonto Character Type). For example, towards the middle of the Sonoran Valley Lands the soil tends to consist of compacted alluvium, sometime cemented together with lime forming caliche. The compaction and caliche result in very low erosion potential. Therefore, most of the washes that occur towards the middle of the Valley/Plains Physical Division are narrow and shallow in character. Conversely, the washes with broad and deeper character tend to occur close to the uplands because of the associated higher annual precipitation amounts and higher erosion potentials. Specifically, during the summer, moist air condenses over the highlands of the Tonto Character Type resulting in large thunderstorms with tremendous downpours. The massive volume of water and associated detritus created during the downpours are all channeled into the Valley River and Washes resulting in erosion. Once the floodwaters reach a certain point in the Sonoran Valley Lands, they loose potential energy and evaporate into the dry desert air. For example, Cave Creek Wash is extremely wide (almost  $\frac{1}{2}$  mile) where it enters the Sonoran Character Type close to the Town of Cave Creek. By the time the wash reaches the middle of the Sonoran Valley Lands (around Thunderbird and Interstate 17) it narrows to about 100 feet wide. In either case the washes tend to have shallow flat channels edged with broken soil or rock.

#### **Vegetation**

Vegetation varies within the Valley Rivers and Washes based upon the proximity of the washes to adjacent vegetation communities. Generally, the washes create conditions that enable species that require higher amounts of moisture to grow and flourish at lower elevation. For instance, the saguaro, paloverde, and

ironwood vegetation association typically associated with the Bajada Physical Division frequently expands out of the Bajada and down into the Valley/Plains via the washes. At the point the vegetation leaves the Bajada through the wash and the adjacent vegetation and composition is different, the community is termed xeroriparian. Other notable species that may occur in this physical division include desert willow, desert broom, velvet mesquite, catclaw acacia, and ragweed. Cottonwood can occur in this physical division, especially when the washes are connected or adjacent to the Sonoran River Lands Subtype.

### **Water Form**

Although water was the primary element that etched this physical division out of the Valley/Plains, it is almost always absent from this landscape unit. The only time the washes flow with water is during and/or after summertime thunderstorms associated with the monsoon season. When flow does occur it is extremely violent, carrying soil, broken pieces of vegetation, and rocks of various sizes. The flow dissipates as quickly as it begun depositing all the materials it picked up during peak flow.

### **Rock Form**

Rock form exists in this landscape unit and is associated with volcanic regions or areas close to the Sonoran Mountain Lands. Water erodes away surface materials on the banks of the washes exposing either bedrock, or boulders / outcrops associated with the Sonoran Mountain Lands. The highest occurrences of rock form within this physical division are associated with the washes immediately adjacent to the Tonto Character Type (e.g., Cave Creek).

## **CULTURAL FEATURES**

### **Development Pattern**

The development pattern of the rural setting is predominantly based on a grid pattern. This allows for efficient irrigation systems and farm operation. Occasionally, the irrigation systems will be based on a circular delivery system, which results in a circular crop pattern still formal in nature. The occurrence of a wash in the rural setting can result in a more informal development pattern adjacent to its banks.

### **Circulation**

Generally, rectilinear unimproved access follows each plot of land being farmed mimicking the grid which the development pattern was originally based upon. Traditionally, large species of trees (i.e., eucalyptus) were planted in rows (termed hedge rows) primarily functioning as property dividers and windbreaks. Generally, if the wash is large enough a bridge will be constructed to cross it. Otherwise, access usually occurs right through the wash, sometimes at 90-degree angles.

## **Building Type**

Normally, one to two story homes are situated adjacent to undisturbed desert and the agricultural fields. Other structures such as barns and large storage sheds are common in the landscape. Typical agricultural crops grown in this landscape unit include, cotton, wheat, alfalfa, sorghum, and citrus.

## **Open Space**

This setting is open in nature lacking any physical barriers between undisturbed desert and agricultural fields. The entire setting is a cultural open space.

## **VISUAL CHARACTERISTICS**

### **Form**

The predominant forms of this landscape range from shallow u-shaped and curvilinear forms to v-shaped very linear forms. Typically, the transition from the flat and slightly sloped forms of the Rural Valley/Plains landscape unit to the forms of the Rural Valley Rivers and Washes landscape unit is rather abrupt, demarcated by the unrefined forms of native or exotic (i.e., tamarisk) plant species.

### **Line**

The line types that are encountered in this landscape unit include horizontal curvilinear lines and horizontal rectilinear lines. Valley Rivers and Washes landscape units that have not sustained landscape modification exhibit curvilinear lines that are accentuated by native and exotic vegetation. Rural Valley Rivers and Washes landscape units that have been highly modified (i.e., creation of irrigation canals), exhibit rectilinear lines that are typically void of vegetation and blend in with the adjacent lines of the Rural Valley/Plains landscape unit.

### **Color**

The colors of this landscape unit are associated with the various crop species that occur within the rural setting including gold, green, and yellow. The beiges and gray-greens of an undisturbed wash contrast with the aforementioned colors, resulting in diversity in the landscape. Washes that are disturbed or modified typically are gray (concrete) or beige (soil cement) and are rather subtle in the landscape, producing little contrast.

## **Texture**

The textures associated with this landscape type are predominately fine. Typically, the rural setting exhibits fine to medium-fine textures that fluctuate with crop growth and rotation, although crops such as citrus exhibit more of a medium texture. The undisturbed wash exhibits fine to medium textures and produces little contrast in the landscape. The disturbed wash exhibits fine textures attributed to the soil cement or concrete used on its banks, causing the wash to visually disappear into the landscape and cause almost no contrast. The occurrence of exotic or natural vegetation results in additional medium textures.

## **Scale**

The scale of this landscape is typically small and linear.

## **Composition**

The two-dimensional forms associated with the Valley Rivers and Washes and the lack of any vertical feature to screen views results in a panoramic landscape composition. If mature vegetation exists adjacent to the banks of the wash, the landscape composition can be either focal or canopied.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **SUBURBAN VALLEY RIVER AND WASHES LANDSCAPE UNIT**

Historically, the small and curvilinear nature of the Valley Rivers and Washes had minimal impact on the formal grid pattern associated with the suburban setting except at the smallest scale of the development (e.g., homes next to Indian Bend Wash). When the developer encountered a wash, they would utilize one or a combination of the following wash modifications (1) channelizing the wash, (2) creating a culvert and building on top of the wash, (3) soil cementing the banks of the wash, and (4) retaining the natural character of the wash for aesthetic and/or wildlife purposes. These modifications were generally based on how many acres of the wash will be potentially disturbed (404 permit), if any threatened or endangered species use the wash for habitat, and the hydrology of the wash (i.e., flood potential, typical flow, etc.). More recently, there has been a move to retain the washes for aesthetic and environmental factors resulting in preservation of curvilinear lines in the landscape. Otherwise, the rectilinear forms and line of the suburban setting are the predominant visual elements of this landscape unit.

### **NATURAL FEATURES**

#### **Landform**

The landforms associated with the Valley River and Washes are subtle yet varied. The washes vary in width and depth depending on the adjacent soil compositions and proximity to the Arizona Uplands (e.g., the Tonto Character Type). For example, towards the middle of the Sonoran Valley Lands the soil tends to consist of compacted alluvium, sometime cemented together with lime forming caliche. The compaction and caliche result in very low erosion potential. Therefore, most of the washes that occur towards the middle of the Valley/Plains Physical Division are narrow and shallow in character. Conversely, the washes with broad and deeper character tend to occur close to the uplands because of the associated higher annual precipitation amounts and higher erosion potentials. Specifically, during the summer, moist air condenses over the highlands of the Tonto Character Type resulting in large thunderstorms with tremendous downpours. The massive volume of water and associated detritus created during the downpours are all channeled into the Valley River and Washes, resulting in erosion. Once the floodwaters reach a certain point in the Sonoran Valley Lands, they loose potential energy and evaporate into the dry desert air. For example, Cave Creek Wash is extremely wide (almost 1/2 mile) where it enters the Sonoran Character Type close to the Town of Cave Creek. By the time the wash reaches the middle of the Sonoran Valley Lands (around Thunderbird and Interstate 17) it narrows to about 100 feet wide. In either case the washes tend to have shallow flat channels edged with broken soil or rock.

## **Vegetation**

Vegetation varies within the Valley Rivers and Washes based upon the proximity of the washes to adjacent vegetation communities. Generally, the washes create conditions that enable species that require higher amounts of moisture to grow and flourish at lower elevation. For instance, the saguaro, paloverde, and ironwood vegetation association typically associated with the Bajada Physical Division frequently expands out of the Bajada and down into the Valley/Plains via the washes. At the point the vegetation leaves the Bajada through the wash, and the adjacent vegetation and composition is different, the community is termed xeroriparian. Other notable species that may occur in this physical division include desert willow, desert broom, velvet mesquite, catclaw acacia, and ragweed. Cottonwood can occur in this physical division, especially when the washes are connected or adjacent to the Sonoran River Lands Subtype.

## **Water Form**

Although water was the primary element that etched this physical division out of the Valley/Plains, it is almost always absent from this landscape unit. The only time the washes flow with water is during and/or after summertime thunderstorms associated with the monsoon season. When flow does occur it is extremely violent, carrying soil, broken pieces of vegetation, and rocks of various sizes. The flow dissipates as quickly as it began, depositing all the materials it picked up during peak flow.

## **Rock Form**

Rock form exists in this landscape unit and is associated with volcanic regions or areas close to the Sonoran Mountain Lands. Water erodes away surface materials on the banks of the washes exposing either bedrock, or boulders/outcrops associated with the Sonoran Mountain Lands. The highest occurrences of rock form within this physical division are associated with the washes immediately adjacent to the Tonto Character Type (e.g., Cave Creek).

## **CULTURAL FEATURES**

### **Development Pattern**

The development pattern of the suburban setting is usually uniform and based upon a formal grid pattern at a macro scale. At a much finer scale, the streets and residential structures immediately adjacent to the wash respond to the wash resulting in a more informal development pattern.

### **Circulation**

The suburban setting's associated circulation systems are generally rectilinear with nonnative to native vegetation planted adjacent to streets. These plantings reinforce the formal grid pattern the suburban

setting is based upon. However, at a finer scale, the circulation may be more curvilinear to respond to the wash.

### **Building Type**

Generally, residential structures are the predominant building types that occur within the suburban setting. The structures tend to be one to two stories that are spatially based on typically rectilinear parcels. Higher end residential developments tend to be organized more informally, with curvilinear access and spatial arrangements of the structures. Larger “big box” commercial developments occur at intersections of main access routes and include a wide variety of structures sizes ranging from individual rectilinear one story buildings to large two story strip malls.

### **Open Space**

Open space in the suburban setting typically includes golf courses and neighborhood and regional parks. Commonly, high-end large lot residential and commercial developments occur adjacent to the open space that occurs in the suburban fabric. Furthermore, the wash becomes the main element of open space within the suburban setting (i.e., Indian Bend Wash).

## **VISUAL CHARACTERISTICS**

### **Form**

The dominant forms of this landscape unit are the small to medium scale cubic to rectangular forms associated with the suburban setting. The subtle forms of the Valley Rivers and Washes were historically ignored when suburban development took place, although recently there has been a movement to retain the washes. Furthermore, the juxtaposition of the one to two story residential or commercial structures associated with the suburban setting typically screen the views of the recessed Valley Rivers and Washes. Vegetation that can potentially occur adjacent to the washes adds unrefined, natural forms that sometimes can reinforce the form of the Valley Rivers and Washes.

### **Line**

The lines associated with this landscape unit are those associated with the suburban setting. The rigid rectilinear lines related to access and suburban structures occur frequently in this landscape unit. If the natural character of the Valley Rivers and Washes has been retained, curvilinear line may be encountered in this landscape unit. The curvilinear line associated with the washes is based on the number and size of washes that cross the suburban setting. Native vegetation with its short vertical lines and curvilinear hiking trails that typically occur adjacent to undeveloped washes within the suburban setting reinforce the curvilinear nature of the wash.

## **Color**

The colors of this landscape unit are associated with the suburban setting including terracottas, whites, browns, and greens. If the wash was left in its natural state, colors of beige to gray-green will be encountered in this landscape unit and contrast with the surrounding colors of the suburban matrix.

## **Texture**

The textures exhibited by this landscape character unit are the fine to medium textures of the suburban development. The suburban texture is visually stronger in this landscape unit, primarily because of the large size of the suburban development and the small size of the Valley Rivers and Washes. The dry watercourses that occur in the Valley Rivers and Washes physical division are typically surfaced with sand and loose gravel, exhibiting fine textures. The occurrence of natural vegetation results in medium textures. However, the occurrence of mostly introduced large vegetation in the suburban landscape screens and visually dominates the smaller native vegetation in most cases.

## **Scale**

The scale of the Valley Rivers and Washes is small compared to the massive scale of suburban developments. The encroachment into the wash's banks, the occurrence of introduced large vegetation, and density of residential structures associated with the urban setting can reduce the washes visually into a small curvilinear line. At a much finer scale the wash, depending on the level of disturbance, may be relatively the same scale as the homes or commercial structures immediately adjacent to it.

## **Composition**

The curvilinear nature of the Valley Rivers and Washes, if vegetated with large plants, results in a focal landscape composition. If the washes are not vegetated, the panoramic composition of the Valley/Plains is characteristic of this landscape unit.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **INDUSTRIAL VALLEY RIVER AND WASHES LANDSCAPE UNIT**

The formal lines and forms of the industrial setting are predominant within this landscape unit. The industrial setting exhibits visual elements that produce strong contrast in the landscape including vertical, diagonal, and horizontal line, extremely fine to coarse textures, large scales, and bright and reflective colors. Conversely, the Valley Rivers and Washes exhibit strictly fine to medium textures, informal and subtle lines and forms, and generally subdued colors. Because the setting and physical division vary so much in their respective visual elements, this landscape unit, specifically adjacent to the Valley Rivers and Washes, exhibits contrast and visual variety.

### **NATURAL FEATURES**

#### **Landform**

The landforms associated with the Valley River and Washes are subtle yet varied. The washes vary in width and depth depending on the adjacent soil compositions and proximity to the Sonoran Arizona Uplands (e.g., the Tonto Character Type). For example, towards the middle of the Sonoran Valley Lands the soil tends to consist of compacted alluvium, sometime cemented together with lime forming caliche. The compaction and caliche result in very low erosion potential. Therefore, most of the washes that occur towards the middle of the Valley/Plains Physical Division are narrow and shallow in character. Conversely, the washes with broad and deeper character tend to occur close to the uplands because of the associated higher annual precipitation amounts and higher erosion potentials. During the summer, moist air condenses over the highlands of the Tonto Character Type resulting in large thunderstorms with tremendous downpours. The massive volume of water and associated detritus created during the downpours are all channeled into the Valley River and Washes, resulting in erosion. Once the floodwaters reach a certain point in the Sonoran Valley Lands, they lose potential energy and evaporate into the dry desert air. For example, Cave Creek Wash is extremely wide (almost 1/2 mile) where it enters the Sonoran Character Type close to the Town of Cave Creek. By the time the wash reaches the middle of the Desert Valley Lands (around Thunderbird and Interstate 17) it narrows to just about 100 feet wide. In either case, the washes tend to have shallow flat channels edged with broken soil or rock.

#### **Vegetation**

Vegetation varies within the Valley Rivers and Washes based upon the proximity of the washes to adjacent vegetation communities. Generally, the washes create conditions that enable species that require higher amounts of moisture to grow and flourish at lower elevation. For instance, the saguaro, paloverde, and ironwood vegetation association typically associated with the Bajada Physical Division frequently expands

out of the Bajada and down into the Valley/Plains via the washes. At the point the vegetation leaves the Bajada through the wash and the adjacent vegetation and composition is different, the community is termed xeroriparian. Other notable species that may occur in this physical division include desert willow, desert broom, velvet mesquite, catclaw acacia, and ragweed. Cottonwood can occur in this physical division, especially when the washes are connected or adjacent to the Sonoran River Lands Subtype.

### **Water Form**

Although water was the primary element that etched this physical division out of the Valley/Plains, it is almost always absent from this landscape unit. The only time the washes flow with water is during and/or after summertime thunderstorms associated with the monsoon season. When flow does occur it is extremely violent, carrying soil, broken pieces of vegetation, and rocks of various sizes. The flow dissipates as quickly as it began, depositing all the materials it picked up during peak flow.

### **Rock Form**

Rock form exists in this landscape unit and is associated with volcanic regions or areas close to the Sonoran Mountain Lands. Water erodes away surface materials on the banks of the washes exposing either bedrock or boulders/outcrops associated with the Sonoran Mountain Lands. The highest occurrences of rock form within this physical division are associated with the washes immediately adjacent to the Tonto Character Type (e.g., Cave Creek).

## **CULTURAL FEATURES**

### **Development Pattern**

The industrial setting is typically organized around a grid pattern, resulting in a formal arrangement of facilities (i.e., substation elements situated on a grid). However, the variety of industrial facilities that occur within a landscape unit may exhibit informal characteristics when viewed from a distance at viewer typical height (i.e., sand and gravel operation). Depending on the condition of the wash (i.e., soil type, bank height, etc.) the grid pattern may be modified resulting in a slightly informal development pattern.

### **Circulation**

Circulation patterns of this landscape unit are typically dictated by the type of industrial facility. Formally organized facilities, such as dams, common in this landscape unit, generally require rectilinear and well-organized access for maintenance and overall operation efficiency (Cave Buttes Dam). Less formal industrial facilities, such as sand and gravel operations, are conducive to a more informal curvilinear circulation pattern but rarely if ever occur in the valley plains. As with the development pattern, the access may be curvilinear depending on the physical constraints imposed by the wash.

## **Building Type**

Large, vertical facilities, typically constructed of concrete and dull to reflective gray metal, are common occurrences in this landscape setting. The facilities range from the relatively low elevations of flood control facilities to the tops of transmission line lattice towers (150 feet). The activities associated with the industrial setting that occur within this landscape unit include sand, gravel, landscape material extraction, and cement plants.

## **Open Space**

Large open spaces typically occur in the industrial setting because of various city and county codes that require buffers. However, in the Valley Rivers and Washes, the undisturbed land surrounding the facility usually is the only open space that occurs.

## **VISUAL CHARACTERISTICS**

### **Form**

The formal rectilinear and cylindrical bold forms associated with the industrial setting are predominant within this landscape unit. For example, the primary industrial facilities that occur in this landscape unit are flood control facilities (dams) and natural resource extraction facilities. Both facility types are formal in nature with a large linear triangular form and vertical cylindrical form, respectively. Conversely, the Valley Rivers and Washes exhibit shallow, narrow to wide, u-shaped, and recessed linear forms, all of which are subordinate visual elements compared to that of the industrial facilities.

### **Line**

The rigid rectilinear lines associated with industrial setting in conjunction with the curvilinear lines of the Valley River and Washes result in a landscape where variety of line exists. As with the visual element of form of this landscape unit, the predominance of lines (i.e., rectilinear or curvilinear) is determined by the scale of the industrial setting compared to that of the Valley River and Washes physical division. In a gravel extraction industrial setting, which frequently occurs in this physical division, undulating lines associated with sand and gravel piles are added to the landscape and contrast with the two-dimensional horizontal lines of the Valley Rivers and Washes. However, the lines associated with the industrial setting in this case would be predominant because of their verticality.

### **Color**

The whites, browns, and reflective grays typically associated with the industrial setting are predominant in this landscape unit because of contrast they create. The large vertical facilities that occur in this landscape

setting are of the composed of metal and steel and are very reflective in nature and visually the strongest colors. The colors of the Valley Rivers and Washes (i.e., beiges, grays, and gray-greens) are rather subdued and blend in with the surrounding Valley/Plains color palette. Therefore, the contrast is created by the industrial facilities, which renders them more visible in this landscape unit.

## **Texture**

Textures found in this landscape unit can range from fine to course depending on the facility and state of the wash where the facility occurs. The fine textures that are encountered in this landscape unit are typically associated with smooth metals to slick gray concrete that industrial facilities exhibit. The predominately fine to medium textures displayed by the Valley Rivers and Washes are modified because of the disturbance associated with the industrial setting (i.e., gravel extraction). Large piles of various sized rocks, boulders, and sand occur throughout this setting that result in coarse textures. The occurrence of vegetation around the facility, typically natural in this physical division, results in another layer of coarse textures. The gravel extraction example takes into account just one of many industrial facilities that can occur in this landscape unit.

## **Scale**

Typically, the scale of the industrial setting is much larger than the scale of the Valley Rivers and Washes because of the verticality of industrial facilities. The size of the Valley Rivers and Washes vary dramatically, therefore it is possible that the industrial facility could be in scale with the Valley Rivers and Washes.

## **Composition**

The contrast that is created from the verticality and formality of the industrial facility results in a feature landscape composition. If the industrial facility was a flood control facility and mimics the visual character of the wash in form, line, color, texture, the wash would retain its focal landscape composition.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **NATURAL/PASTORAL VALLEY PLAINS LANDSCAPE UNIT**

The Valley Plains physical unit occurs within the Sonoran Valley Lands Subtype of Maricopa County. The Valley Plains consists of a slightly sloping plain composed of compressed sediment thousands of feet deep. Surface veneer varies across the landscape including sand, desert pavement, caliche, and loose gravel. Vegetation varies across the landscape depending on elevation, soil conditions, and adjacent landscape types. The upper elevations, adjacent to the Bajada physical unit, sustain a mixture of saguaro, paloverde, creosote, and cactus. The lower elevations adjacent to the River Terrace physical unit exhibit large areas of predominantly widely spaced creosote bush. Undisturbed drainages allow saguaro and a variety of other plant species that typically occur in upper elevations of this physical unit to occur in the lower elevations.

### **NATURAL FEATURES**

#### **Landform**

The natural Valley Plains landscape unit consists of a slightly sloping (indiscernible to the naked eye) flat broad surface with shallow surface undulations where the land has not been disturbed. The landscape unit typically starts at the edge of the Bajada physical division sloping downward towards the River Terrace physical division.

#### **Vegetation**

The vegetation of the natural Valley Plains ranges from mixed paloverde and cacti including saguaro, adjacent to the Bajada physical unit, to creosote flats adjacent to the Sonoran River Lands. Stringers of xeroriparian vegetation, which includes catclaw acacia, blue paloverde, desert hackberry, ironwood, and saguaro, occur throughout this physical landscape unit. Sometimes, along the fringes of development, introduced species spread into the natural desert including African sumac, Mexican paloverde, and tamarisk.

#### **Water Form**

Natural water form in the Valley Plains is non-existent except for washes and small drainages that are associated with undisturbed lands. These water features flow for extremely short durations during and after summertime thunderstorms and are commonly known as flash floods.

## **Rock Form**

Occasionally, rock outcrops occur in this landscape unit where the land has not been disturbed and are typically void of vegetation.

## **VISUAL CHARACTERISTICS**

### **Form**

The forms associated with this landscape character unit are primarily horizontal with little topographic relief. Undulations of the landform occur primarily adjacent to the Sonoran River Lands and Sonoran Mountain Lands. The occurrence of vegetation results in additional unrefined small forms.

### **Line**

Lines associated with this landscape are predominately linear in nature and associated with the horizon. The curvilinear lines that do occur are associated with small shallow drainages, and sometimes are not discernable in the landscape because of the inferior views associated with this landscape unit. Additionally, vertical lines are sometimes expressed by vegetation, specifically along the edges of the Sonoran Mountain and Sonoran River Lands subtypes.

### **Color**

The color in the Valley/Plains primarily comes from soil and vegetation. Soils vary from sand to beige with black gravel volcanic gravel occurring throughout the unit. Vegetation, although relatively sparse in the region, results in subtle gray-greens with seasonal colors of yellows, purples, and whites.

### **Texture**

The texture of the Valley/Plains is primarily driven by the vegetation of the region. The pure stands of creosote result in a medium textured landscape. The addition of saguaro and some desert trees such as paloverde and ironwood result in a landscape that has a medium to coarse texture.

### **Scale**

The compact growth associated with desert plants mesh with the featureless character of the Valley Plains, resulting in a landscape where all elements are in scale with each other.

### **Composition**

The wide-open views of the valley plains are typical of a panoramic landscape composition.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **RURAL VALLEY/PLAINS LANDS**

The formal patchwork-like appearance of the rural setting harmonizes with the horizontal lines associated with the valley plains. This leads to a landscape character unit where the cultural and natural attributes are co-dominant. The lack of vertical elements in both the rural setting and physical division reinforce the visual harmony of the unit. Furthermore, all elements of form, line, color, texture in both the natural and cultural landscapes retain their identities in this landscape character unit.

### **NATURAL FEATURES**

#### **Landform**

The Natural Valley/Plains Landscape Unit consists of a slightly sloping (indiscernible to the naked eye) flat broad surface with shallow surface undulations where the land has not been disturbed. The landscape unit typically starts at the edge of the Bajada Physical Division, sloping downward towards the River Terrace physical division.

#### **Vegetation**

The vegetation of the Natural Valley/Plains ranges from mixed paloverde and cacti including saguaro adjacent to the Bajada Physical Unit, to creosote flats adjacent to the Sonoran River Lands. Stringers of xeroriparian vegetation, which includes catclaw acacia, blue paloverde, desert hackberry, ironwood, and saguaro, occur throughout this physical landscape unit. Sometimes, along the fringes of development, introduced species spread into the natural desert including African sumac, Mexican paloverde, and tamarisk.

#### **Water Form**

Natural water form in the Rural Valley/Plains is non-existent except for washes and small drainages that are associated with undisturbed lands. These water features flow for extremely short durations during and after summertime thunderstorms and are commonly known as flash floods. Cultural modification, especially irrigation canals, has introduced water to the landscape in the form of pools and fountains.

#### **Rock Form**

Occasionally, rock outcrops occur in this landscape unit where the land has not been disturbed and are typically void of vegetation.

## **CULTURAL FEATURES**

### **Development Pattern**

The development pattern of the rural setting is predominantly based on a grid pattern. This allows for efficient irrigation systems and farm operation. Occasionally, the irrigation systems will be based on a circular delivery system, which results in a circular crop pattern still formal in nature.

### **Circulation**

Generally, rectilinear unimproved access follows each plot of land being farmed, mimicking the grid which the development pattern was originally based upon. Traditionally, large species of trees (i.e., eucalyptus), were planted in rows (termed hedge rows) primarily functioning as property dividers and windbreaks.

### **Building Type**

Normally, one to two story homes are situated adjacent to undisturbed desert and the agricultural fields. Other structures such as barns and large storage sheds are common occurrences in the landscape.

### **Open Space**

This setting is open in nature, lacking any physical barriers between undisturbed desert and agricultural fields. The entire setting is a cultural open space.

## **VISUAL CHARACTERISTICS**

### **Form**

The form of the landscape character unit remains primarily two dimensional as a flat plain. Cultural modifications associated with the rural setting, such as canals and residential structures, result in u- to v-shaped linear forms that separate the forms associated with the fields and cubic forms. Hedgerows exhibit large- to medium-sized oblong to unrefined forms that contrast with the rest of the primarily flat forms of this landscape unit.

### **Line**

The predominately horizontal lines associated with the Valley/Plains are reinforced by the lines of the irrigation canals and hedgerows. Furthermore, hedgerows, if large vegetation is used (i.e., eucalyptus), exhibit vertical lines, which contrast with the rest of the lines associated with the Valley/Plains. Additionally, the structures encountered within this landscape unit present short vertical and horizontal lines that infrequently occur throughout the landscape.

## **Color**

Color is introduced through the planting of crops and introduced rural structures. The rotation of the crops, usually seasonal, adds variety and rhythm to the landscape. The various colors associated with the rural setting (i.e., greens, yellows, reds, and whites), add enormous contrast to the landscape rendering color the dominant visual element in this landscape character unit. Undisturbed, gray-green colors of desert vegetation are common.

## **Texture**

The textures of this landscape range from the fine textures of newly planted seedlings to the course textures of sorghum as it is ready to harvest. Undisturbed landscape with native vegetation intact results in a medium texture.

## **Scale**

The short stature of the crops associated with the rural setting in the vast Valley/Plains Physical Landscape Unit results in a landscape where all elements are in scale.

## **Composition**

The wide-open views are preserved in this landscape character unit, resulting in a panoramic landscape composition.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **SUBURBAN VALLEY/PLAINS LANDSCAPE UNIT**

The organizational element of the suburban setting, the grid, is uninhibited in this physical unit. The result is a complete transformation of the visual landscape from the medium texture of the creosote flats and wide-open views to the hard angular lines associated with strip malls and the large mass of residential red tile roofs. Vegetation, mostly introduced species, is typically planted along city streets and neighborhoods, further articulating the grid and resulting in straight line and introduced color. The cultural setting is predominant in this landscape character unit with color and line being the prevailing visual elements.

### **NATURAL FEATURES**

#### **Landform**

The Suburban Valley/Plains consist of a slightly sloping (indiscernible to the naked eye) flat broad surface with shallow surface undulations where the land has not been disturbed. The landscape unit typically starts at the edge of the Bajada Physical Division, sloping downward towards the river terrace physical division.

#### **Vegetation**

The vegetation of the Suburban Valley/Plains ranges from mixed paloverde and cacti including saguaro, adjacent to the Bajada Physical Unit, to creosote flats adjacent to the Sonoran River Land. Stringers of xeroriparian vegetation, which includes catclaw acacia, blue paloverde, desert hackberry, ironwood, and saguaro, occur throughout this physical landscape unit. Where development has occurred, introduced species are fairly common and include a wide variety of species from around the world.

#### **Water Form**

Natural water form in the Suburban Valley Lands is non-existent except for washes and small drainages that are associated with undisturbed lands. These water features only flow for extremely short durations during and after summertime thunderstorm and are commonly known as flash floods. Cultural modification, especially commercial and residential development, has introduced water to the landscape in the form of pools, fountains, small lakes, and small meandering streams.

## **Rock Form**

Occasionally rock outcrops occur in this landscape unit and are typically void of vegetation. The rock outcrops usually occur adjacent to the Sonoran Mountain Lands and associated with the pediment<sup>1</sup> of the mountains.

## **CULTURAL FEATURES**

### **Development Pattern**

The development pattern of the suburban setting is usually uniform and based upon a formal grid pattern at a macro scale.

### **Circulation**

The suburban setting's associated circulation systems are generally rectilinear with nonnative to native vegetation planted adjacent to streets. The planting reinforces the formal grid pattern the suburban setting is based upon.

### **Building Type**

Residential structures are the predominant building types that occur within the suburban setting. The structures tend to be one to two stories that are spatially based on rectilinear parcels. Higher end residential developments tend to be organized more informally, with curvilinear access and spatial arrangements of the structures. Larger "big box" commercial developments occur at intersections of main access routes and include a wide variety of structures sizes ranging from individual rectilinear one story buildings to large two story strip malls.

### **Open Space**

Open space in the suburban setting typically includes golf courses and neighborhood and regional parks. High-end large-lot residential and commercial developments often occur adjacent to the open space that occurs in the suburban fabric.

## **VISUAL CHARACTERISTICS**

### **Form**

The grid of the suburban development pattern is characteristic of the landscape character unit because of infrastructure efficiency and the lack of physical constraints. Furthermore, the large nature of the

Valley/Plains allows for development to spread out. The rows of commercial structures adjacent to city streets and square blocks result in geometric forms that are predominant in this landscape.

## **Line**

Linear horizontal lines are frequently exhibited in this landscape and are primarily associated with the rectilinear access of suburban development. The typically non-native vegetation planted adjacent to the streets results in short vertical lines and reinforces the rectilinear grid pattern. Additional vertical lines expressed by this landscape unit are associated with the many different structures that occur within the suburban setting.

## **Color**

Colors are varied throughout this landscape unit and are attributed to the vegetation and structures that occur within the suburban setting. Colors associated with the non-native vegetation typically used in suburban development range from bold greens to yellows, purples, and browns. Subtle reds, blues, whites, and shiny grays associated with metals are introduced to the landscape in the form of tile roofs, stucco homes, and commercial building architecture.

## **Texture**

The suburban Valley/Plain setting exhibits fine to medium textures, which are associated with the vegetation and the smooth uniform nature of the tile roofs and streets. The addition of large non-native trees, which eventually grow to form the skyline, add a medium texture to the landscape.

## **Scale**

The low vertical nature of the structures and vegetation associated with the suburban setting are in scale with the wide expanses of the Valley/Plain Physical Unit.

## **Composition**

The vastness of the Valley/Plain with the lack of topographical features and the generally low elevation construction associated with suburban development preserves the panoramic composition of this landscape.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **URBAN VALLEY/PLAINS LANDSCAPE UNIT**

The rectilinear organization of the urban setting is predominant in the Urban Valley/Plains Landscape Unit. The lack of topographical features and the vastness of the valley are conducive to the urban development pattern (e.g., densely massed large buildings organized on a grid). The vertical nature of the urban setting contrasts sharply with the horizontal plain of the valley, adding visual interest to the landscape. Additional contrast is added through color, including reflective steel, tinted glass, and concrete used in the construction of most of the high-rise buildings. The cultural elements are predominant in this landscape unit.

### **NATURAL FEATURES**

#### **Landform**

The Urban Valley Plains consist of a slightly sloping (indiscernible to the naked eye) flat broad surface with shallow surface undulations where the land has not been disturbed. The landscape unit typically starts at the edge of the Bajada Physical Division, sloping downward towards the River Terrace Physical Division.

#### **Vegetation**

The vegetation of the Urban Valley/Plains ranges from mixed paloverde and cacti, including saguaro, adjacent to the Bajada Physical Unit, to creosote flats adjacent to the Sonoran River Lands. Stringers of xeroriparian vegetation, which includes catclaw acacia, blue paloverde, desert hackberry, ironwood, and saguaro, occur throughout this physical landscape unit. Where development has occurred, introduced species are fairly common and include a wide variety of species from around the world. The density of the vegetation tends to be sparse in the urban setting because of the difficult growing conditions associated with the reflected heat produced by concrete in the summer months.

#### **Water Form**

Natural water form in the Urban Valley/Plains is non-existent except for washes and small drainages associated with undisturbed lands. These water features flow for extremely short durations during and after summertime thunderstorm and are commonly known as flash floods. Cultural modification, especially commercial development, has introduced water to the landscape in the form of pools and fountains.

## **Rock form**

Occasionally, rock outcrops occur in this landscape unit where the land has not been disturbed and are typically void of vegetation. Structures associated with the urban setting often require very large foundations, resulting in the removal of all natural rock form.

## **CULTURAL FEATURES**

### **Development Pattern**

The vertical development pattern typically associated with the urban setting is based on a formal grid pattern. The result is a landscape where geometric shapes are predominant and influence all other cultural features.

### **Circulation**

Circulation patterns of this landscape unit typically emulate the rectilinear grid patterns that dictate the development pattern. The streets tend to be narrow in nature because of the densely arranged structural elements. Formal arrangements of low-density vegetation occur adjacent to streets and pedestrian sidewalks, articulating the grid circulation pattern.

### **Building Type**

A large variety of building types exist in this landscape unit. Apartment style residences, two to five stories in height typically occur on the perimeter of the urban environment. High-rise office building constructed of concrete, steel, and glass, and ranging from 10 to 50 stories occur towards the middle of the landscape unit, forming the core associated with urban settings.

### **Open Space**

Large open spaces generally do not occur in the urban setting because of the density of the structures and associated circulation patterns. However, smaller pocket parks, plazas, and large lawns associated with high rises frequently occur.

## **VISUAL CHARACTERISTICS**

### **Form**

The density of the structures associated with the urban setting result in a mass of cubic to rectangular forms. These forms contrast with the predominately flat form of the Valley/Plains adding variety to the

landscape. Other elements found throughout this landscape are those associated with the irregular forms of vegetation, rectangular forms associated with vehicles, and cylindrical forms associated with the streetlights.

## **Line**

The silhouette of urban structures massed together results in both horizontal and vertical lines that are characteristic of this landscape unit. The striking vertical lines associated with the sides of the lofty high-rise buildings that occur towards the center of this landscape unit tend to be the predominant element in the landscape. The short vertical lines of the formally positioned vegetation punctuate the horizontal lines of the city streets.

## **Color**

Color in this landscape character unit includes reflective to dull grays from the concrete used to construct the high rises, hues of blue found in the glass used in the high rises, and browns to white used in stucco associated with smaller urban structures. Vegetation adds accent colors of reds, greens, and yellows, highlighting the foundations of the many structures that occur in the urban setting. The streets are usually surfaced with black asphalt, which adds contrast to this landscape setting.

## **Texture**

The textures of this landscape unit are predominately fine and are typically associated with the smooth surfaces and clean angular lines of the structures found in the urban setting. The vegetation that occurs within the landscape unit (i.e., street trees), adds a medium-coarse texture to the landscape, which contrasts with the fine texture of the urban structures.

## **Scale**

The scale of the urban setting is rather large when viewed from within. When viewed from afar, the horizontal vastness of the Valley/Plains and the vertical lines of the high rises are in relative balance.

## **Composition**

The landscape composition is a feature landscape because of the dominate nature of the urban setting (i.e., form, line, and color) and results in high contrast, drawing visual attention.

## **SONORAN DESERT CHARACTER TYPE SONORAN VALLEY LANDS SUBTYPE**

### **INDUSTRIAL VALLEY/PLAINS LANDSCAPE UNIT**

The uniform landscape of the Valley/Plains combined with the industrial setting results in a landscape where cultural modifications are the predominant visual element. The horizontal lines of the Valley/Plains are disturbed by the placement of the often formal and large-scale facilities of the industrial landscape. The materials associated with the facilities range from metal to concrete, resulting in colors of white, gray, dulled gray, or reflective gray. This color palette and the sheer mass and formality of the facilities tend to be the prime visual element in the landscape.

### **NATURAL FEATURES**

#### **Landform**

The industrial Valley/Plains consist of a slightly sloping (indiscernible to the naked eye) flat broad surface with shallow surface undulations where the land has not been disturbed. The landscape unit typically starts at the edge of the Bajada Physical Division, sloping downward towards the River Terrace Physical Division.

#### **Vegetation**

The vegetation of the Industrial Valley/Plains ranges from naturally mixed paloverde and cacti, including saguaro, adjacent to the Bajada Physical Unit, to creosote flats adjacent to the Sonoran River Lands. Stringers of xeroriparian vegetation, which includes catclaw acacia, blue paloverde, desert hackberry, ironwood, and saguaro, occur throughout this physical landscape unit. Where natural vegetation has been removed, exotic to natural vegetation is often planted to serve as a visual buffer or to bring aesthetics back to the landscape.

#### **Water Form**

Natural water form in the Industrial Valley/Plains is non-existent except for washes and small drainages that are associated with undisturbed lands. These water features flow for extremely short durations during and after summertime thunderstorms and are commonly known as flash floods. Some industrial facilities, particularly power plants, require large amounts of water in the form of detention basins or cooling ponds.

#### **Rock Form**

Occasionally rock outcrops occur in this landscape unit where the land has not been disturbed and are typically void of vegetation. However, rock form is usually removed for facilities.

## **CULTURAL FEATURES**

### **Development Pattern**

The industrial setting is typically organized around a grid pattern resulting in a formal arrangement of facilities (i.e., substation elements situated on a grid). However, the variety of industrial facilities that occur within a landscape unit may exhibit informal characteristics when viewed from a distance at a typical height (i.e., substation with its different size and types of structures).

### **Circulation**

Circulation patterns of this landscape unit are typically dictated by the type of industrial facility. For example, formal rectilinear circulation patterns occur because they promote efficient access for maintenance and routine operations, such as at Pinnacle Peak Substation in northeast Maricopa County. Less formal industrial settings, such as landfills, are conducive to a more informal curvilinear circulation pattern as in the Skunk Creek Landfill in northern Maricopa County. Generally, the formal facility is predominant within this landscape unit.

### **Building Type**

Large facilities constructed of concrete, metal, and glass are common in this landscape setting. The building and facilities range from the relatively low elevations (flood control facilities) to the tops of transmission line lattice towers (150 feet). Typical facilities that occur in the Valley/Plains Physical Division include substations, warehouses, power plants, landfills, and airports.

### **Open Space**

Large open spaces often occur in the industrial setting because of various city and county codes that require buffers. Pocket parks, small plazas, and large lawns associated with some of the facilities frequently occur.

## **VISUAL CHARACTERISTICS**

### **Form**

The form of most industrial facilities in this landscape unit are formal in nature and massed together. The vertical wide to narrow geometric forms usually exhibited by industrial facilities contrasts with the frequently flat, slightly sloped form of the Valley/Plains. Forms of industrial facilities range from the cylinders of power plant cooling stacks to the rectilinear forms of warehouses and storage facilities.

## **Line**

The lines associated with this landscape unit are rectilinear to cylindrical with some verticality depending on the facility. These lines tend to be the predominant element in this landscape unit. The horizontal lines associated with the Valley/Plain contrast with the lines of the industrial facilities.

## **Color**

The subdued colors of the Valley/Plains contrast with the various reflective shades of gray generally associated with industrial facilities. In certain instances, the facility designers may have taken the natural landscape character into account, thus rendering a facility that blends in and minimizes contrasts (Dennis adds names and descriptions of flood control facilities).

## **Texture**

The textures of this landscape unit range from fine to coarse depending on the facility. Power plants, substations, and radio towers typically exhibit coarse textures, while warehouses, and landfills exhibit fine textures. Typically the texture, either coarse or fine, of the industrial setting dominates the landscape character, primarily because of the mass of the facilities and the contrast created when adjacent to natural valley plains.

## **Scale**

Industrial settings, typically bold in form and color, result in contrast in the landscape, which makes the landscape elements (i.e., the natural and cultural attributes) look out of scale with each other.

## **Composition**

The large mass and contrast introduced into the Valley/Plains through form, line, texture, and color, render the modified landscape composition as being a feature landscape.

# Appendix F

## Landscape Design Guidelines for Application to Flood Control Projects



## Aesthetic & Multiple-Use Design Guidelines for

### Flood Control Basins and Channels

Dennis Holcomb, Senior Landscape Planner, FCDMC

Rev. 6 May 28, 2002

This document contains general guidelines for incorporating aesthetic features and recreation multi-use opportunities into flood protection basins and channels.

#### Goals:

The primary goals for the aesthetic treatment of District flood protection facilities is to incorporate features and measures that will:

- Enhance the visual appearance of flood protection facilities
- Help preserve the visual character of natural Sonoran Desert landscapes
- Protect and enhance local community character
- Create aesthetic value

An additional goal is to enhance the public value of the District's flood protection facilities by designing these facilities to provide opportunities for incorporating year round recreation open space multiple-uses, by others, as an integral part of structural design.

Achievement of these goals is an integral component of the Flood Control Districts overall mission, and is an important ingredient for gaining public acceptance and local community support for District projects and programs.

#### Basic Premises:

The guidelines contained in this document identify a variety of aesthetic features and treatments that may be incorporated into the design of the District's flood protection facilities to assist in achieving the above stated goals. They are based on the premise that achievement of these goals will be most effectively accomplished by borrowing the attributes of landform, waterform, rockform, vegetation, and cultural forms found in natural and local community landscape settings, and incorporating their visual characteristics of form, line, color, texture, scale and composition into the superstructure of the District's flood protection facilities. A second premise is that provision of opportunities for incorporating open space multi-uses will be most effectively achieved through 1) facility grading designs that provide for safe year round accessibility, 2) provision of useable areas for outdoor recreation activities at elevations above nuisance flows and frequent storms, and 3) design of O&M roads and other structural components as multi-use facilities.

#### Application:

These guidelines are intended to serve as a general framework for development of more detailed aesthetic guidelines for specific landscape settings, including urban, suburban, industrial, rural, natural and primitive landscape settings. These more detailed guidelines are currently proposed to be included as part of the update of the District's Policy for the Aesthetic Treatment and Landscaping of Flood Control Facilities.

These guidelines are also intended to serve as a framework for use by Consultants in the development of more detailed aesthetic design guidelines required for implementation of the Landscape Themes for basin and channel facilities identified in Water Course and Area Drainage Master Plans.

General  
Design  
Guidelines

Guidelines  
for  
Landscape Settings  
(District Aesthetics Policy)

Guidelines  
for  
Landscape Themes  
(ADMP's & WCMP's)

Project  
Design

It is intended that these guidelines will be modified or adapted, as appropriate, to respond to: 1) the visual character of specific basin and channel sites and their settings; 2) the Landscape Themes identified in Water Course and Area Drainage Master Plans for District flood protection facilities; and 3) the needs and desires of local communities and the public. It is recognized that implementation of these guidelines may be constrained where available rights of way or funding for flood protection facilities is limited. Guidance is offered in the following sections on the relative importance of the various aesthetic features identified herein, and their priority for selection where right of way or funding limits opportunities for implementing the full feature set that may be desired for a specific project.

## **Aesthetic and Multiple-Use Design Guidelines for Basins**

### **Provide Site Capacity for Aesthetic Features**

- Reserve a minimum of 30% of basin sites for inclusion of aesthetic features into the project, such as perimeter area set backs, slope warping, freeform shaping and bottom area contouring,. Eg. limit the footprint of basins and their related component structures (inlets, outlets, weirs, drop structures, energy dissipaters, O&M roads, etc.) to a maximum of 70% of the total area of the site.
- Acquire basin sites with sufficient capacity to enable disposal of some or all excavated material on-site, wherever possible, if costs to haul and dispose of excavated material approaches the cost to purchase additional right of way and dispose excavated material on-site. Design on-site disposal areas to create aesthetic value (Refer to Basin Perimeter Set Back Buffer Zone for guidance on grading of on-site disposal areas).

**Basin Size** (reserved)

**Basin Depth** (reserved)

**Basin Volume Capacity for Aesthetic Features** (reserved)

### **Basin Surface Treatment**

- Favor soft lined over hard lined channel facilities, wherever possible.

### **Basin Perimeter Set Back Buffer Zone**

- Provide a minimum 30-50' variable width open space set back between the top of the basin and all property lines, to help provide a visual transition with the surrounding streetscapes and adjacent properties. The area provided for the open space buffer zone is in addition to any area required for O&M roads and other support facilities that are located within the perimeter area of the basin.
- Provide a variety of rounded hill forms (landscape berms) of variable heights, widths and slope gradients within the set back buffer zone, to break up sight lines, reduce the apparent size of the basin and create a more human scale landscape at the interface with adjacent properties. Slope gradients should be limited to a maximum of 5:1 where opportunities for providing turf planting is desired. Where public safety is a concern, the height of landscape berms located adjacent to streets should be limited to maximum vertical height of three feet, and arranged in such a way so as to incorporate lines of sight from adjacent streets that will accommodate policing.
- Provide O&M road(s) with a meandering alignment that is related to the contours and the established landscape theme of the basin peripheral area. Design O&M road grading and alignment to provide opportunities for recreation multi-use and accessibility.
- All support structures located within the perimeter area should be designed and located to be visually subordinate (minimal visibility) to the landscaping and aesthetic features of the buffer zone and to be consistent with the established landscape theme for the facility.

### **Basin Configuration and Shape**

- The overall configuration of Basins (top of slope) should be irregular, rounded and free form.
- Round all corners of basins to avoid the appearance of square corners, utilizing a variety of curve radii, to help create variety in the overall form of the basin.
- Avoid use of straight lines, geometric shapes, aligning the basin top of slope parallel with property lines, or mimicking the shape of the property, wherever possible.

### **Basin Side Slopes**

- Provide Basins with side slopes that are warped to provide rounded undulations, with slope gradients that vary from 4:1 to 12:1. Slope gradients should be limited to a maximum of 5:1 where opportunities for providing turf planting is desired. The number of undulations on each side and their degree of curvature should be varied depending on the overall length of basin side slopes and the degree of undulation desired to meet the desired landscape theme. As a general rule, provide a minimum of one undulation (in and out) per side or for every 300-500 feet of slope length.
- On larger basins (5 acres or more), the side slope undulations should be enlarged to form one or more peninsulas and bays to help reduce the apparent size of the basin, increase visual variety, and help define possible planned multi-use areas.
- On very large basins (20 acres or more), the peninsulas should be elongated to form ridges of variable height and width to sub-divide the basin into smaller units.
- Meander the alignment of O&M access roads located on side slopes with the topographic undulations. Limit road grades to a maximum of 5% to provide opportunities for recreation multi-use.
- Provide component structures such as inlets, outlets, spillways and energy dissipaters that blend with and are integrated into the topographic form of the side slopes.

### **Basin Bottom Areas**

- The toe of side slopes (perimeter of the basin bottom) should be freeform and meander inversely with the meander of the top of the side slopes.
- Basin bottom areas should be graded to create the appearance of rolling topography (where athletic fields are not planned), terraces, or a combination thereof, and provide positive drainage to the basin outlet.
- Rolling topography should have relief that varies a minimum of 3-5 feet vertically to create effective visual variety in the topographic form of the basin bottom.
- Terraces should be freeform in shape and variable in size and vertical elevation within the basin. The size of the terraces should be responsive to the physical requirements of any identified recreation multi-uses. Terraces should have finished elevations that are higher than 2-year nuisance flows and short term storms (5 to 10 year storms) to provide opportunities to incorporate recreation multi-uses.
- Provide a meandering low flow channel of variable width within the bottom of the basin. Portions of the low flow channel should meander away from the toe of the side slopes. The low flow channel may be located through the central portion of the basin to help create spatial variety, reduce the apparent size of the bottom area, and delineate recreation multi-use functional areas. Provide for split flows low flow channels separated by mounded islands, where possible, to create added topographic variety and visual interest. Design all drop structures required for low flow structures to be “water features” (refer to Structural Components). Additional aesthetic treatment (materials, forms, colors, etc.) of the low flow facility should be consistent with the landscape setting or the established Landscape Theme for the basin.
- Provide ponds or other water features where opportunities exist. Ponds and water features should have a freeform shape. Inlet and outlet component structures of ponds and other water features should be designed to be consistent with the landscape setting or the established Landscape Theme for the basin.
- Provide for O&M roads within the bottom area that are meandering, visually related to the contours of the bottom area, and responsive to the established landscape theme. Design O&M road locations, alignments and grades to provide accessibility for recreation multi-uses wherever possible. Provide O&M road crossings of the low flow facility to enhance recreation multi-use opportunities. Ensure that O&M road crossings of the low flow facility occur at right angles to minimize crossing lengths, visual impacts, construction costs and maintenance requirements.

**On-site Disposal of Excavation Material**

- Utilize excavated earth materials on site adjacent to the channels, wherever possible, to create a rolling upland park-like hillscape to minimize haul costs of excavated materials and enhance aesthetic values.

**Basin Orientation**

- Physically orient the overall configuration of the basin to provide recreation multi-users with views of primary landscape focal points, wherever possible.

**Scenic Features Preservation**

- Preserve and/or enhance on-site natural and cultural features that positively contribute to the character and scenic quality of the project area and its surrounds, wherever possible.

**Basin Structural Components**

- Provide structural components such as side weirs, spillways, energy dissipaters, and inlets that blend into the topographic form of the basin and are consistent with the established landscape theme through use of appropriate materials, colors, scale, and forms. For example, provide natural looking drop structures where appropriate to the setting, and arched and stepped drops as opposed to baffle block designs wherever possible.
- Incorporate use of existing on-site materials in the design of the basin and its structural components wherever possible.
- Favor structural solutions that create the appearance of soft structures (earthen) over hard structural methods (concrete) to achieve the desired function of the structures in basins, wherever possible.
- Avoid locating above ground structural components within key focal point areas of the project site.
- Provide structural components whose form can also serve needed recreation multi-purpose functions, wherever possible.

**Vegetation Planting and Surface Treatment**

- Provide for landscape planting and surface treatment of the entire site, including the basin interior, peripheral areas, and any other areas that are part of the site or property.
- Provide mature tree cover canopy for a minimum of 50% of the ground area of the basin site, including the basin side slopes and bottom area.
- Provide an overall arrangement and composition of plants and other landscape materials that creates spatial variety, enframes views and landscape focal points, reduces the apparent size of the basin, reduces slope uniformity, screens or softens the appearance of hard structural components, and achieves the established landscape theme.
- Utilize a plant palette that is consistent with the landscape setting or the established Landscape Theme.
- Provide boulders, river rock and gravel surface treatments in combination with vegetation planting that are consistent with the established landscape theme for the basin site. Plant all boulders a minimum of 50% of their mass in the ground with the weathered (non-fractured) side up to achieve a natural appearance.
- Provide for salvage and re-establishment of indigenous vegetation, wherever possible, giving first priority to slow growing native species over fast growing types.
- Provide accent plantings and other aesthetic features, as appropriate, for all identified on-site focal point areas, multi-use entryways and nodal areas.
- Utilize and design planting and other surface treatments for environmental mitigation purposes, erosion control, and dust abatement to meet landscape aesthetics project objectives, wherever possible, and conserve and maximize the use of established cost ceilings for landscaping and aesthetic treatments of flood control projects.

- Emphasize use of low maintenance landscape planting themes and irrigation systems in locations where the District will have landscape maintenance responsibility. Minimize use of plant materials, especially turf grasses, that will require mowing, unless required for erosion protection. Utilize vegetation species that will require little, if any, watering after initial planting. Utilize tall pot planting techniques and alternative methods of irrigation, such as application of DriWater, where appropriate, to reduce initial and maintenance costs for landscaping.
- Limit cost estimates and expenditures for vegetative planting to the amounts established in the most recently updated cost-ceiling tables contained in the appendix of the District's approved Policy for the Aesthetic Treatment and Landscaping of Flood Control Projects.

**Aesthetic Treatment Priorities**

- Utilize the following as guidelines for priority selection of aesthetic features where right of way, funding or other constraints preclude inclusion of all of the above aesthetic features in the design of the superstructure of basin facilities:
  - Where funding limited, give priority to acquisition of right of way for incorporating aesthetic features over expenditure of funds for planting and irrigation systems.
  - Where available right of way is limited, utilize the following for prioritizing the selection of aesthetic features to incorporate into basin projects:
    1. Peripheral area set back and buffer zone
    2. Providing an overall freeform shape
    3. Slope warping
    4. Topographic variations in basin bottom areas

## Aesthetic and Multiple-Use Design Guidelines for Channel Conveyance Facilities

### **Site Size and Utilization**

- Reserve a minimum of 30% of channel sites for inclusion of aesthetic features into the project, such as perimeter area set backs, slope warping, freeform shaping and bottom area contouring. E.g. limit the footprint of channels and their related component structures (inlets, outlets, weirs, drop structures, energy dissipaters, O&M roads, etc.) to a maximum of 70% of the total area of the site.
- Acquire Channel sites with sufficient right of way to enable disposal of some or all excavated material on-site, wherever possible, if costs to haul and dispose of excavated material approaches the cost to purchase additional right of way and dispose excavated material on-site. Design on-site disposal areas to create aesthetic value (Refer to Channel Perimeter Area Set Back Buffer Zone for guidance on grading of on-site disposal areas).

### **Channel Surface Treatment**

- Favor soft lined over hard lined channel facilities, wherever possible.

### **Channel Depth** (reserved)

### **Channel Flow Capacity (Q)**

- Provide sufficient flow rate capacity to accommodate trees and shrubs on a minimum of 50% of the interior area of channel facilities that are not hard lined.

### **Channel Perimeter Area, Set Back and Buffer Zone**

- Provide a 30-50' variable width open space set back between the top of the channel and all property lines, to help provide a visual transition with the surrounding streetscapes and adjacent properties, where available right of way allows. The area provided for the open space buffer zone is in addition to any area required for O&M roads and other support facilities that are located within the perimeter area of the channel.
- Provide a variety of rounded hill forms (landscape berms) of variable heights, widths and slope gradients within the buffer zone, to break up sight lines, create variety in the apparent size of the channel, and create a more human scale landscape at the interface with adjacent properties. Slope gradients should be limited to a maximum of 5:1 where opportunities for providing turf planting is desired. Where public safety is a concern, the height of landscape berms located adjacent to streets should be limited to maximum vertical height of three feet, and arranged in such a way so as to incorporate lines of sight from adjacent streets that will accommodate policing.
- Provide O&M road(s) with a gently meandering alignment that is related to the contours of the landscape berms, and the established landscape theme. Design O&M road grading and alignment to provide opportunities for incorporation of recreation multi-use and accessibility.
- All support structures located within the perimeter area should be designed and located to be visually subordinate (minimized visibility) to the landscaping and aesthetic features of the buffer zone and to be consistent with the established landscape theme for the facility.

### **Overall Channel Configuration and Shape**

- Provide channels with variable widths that range from +/- 25% within any 1-mile reach. Provide a minimum frequency of four variations within any 1-mile of channel reach.
- Provide channels whose overall form is curvilinear and meanders back and forth in the landscape, where available right of way allows.
- Provide a degree of meander offset from the channel centerline equal to a minimum of 50% of the channel width, as measured from the channel tops of slope.
- Provide a frequency of meander that varies from 2 to 4 meanders (in and out) per mile of channel length.
- Provide channel configurations that minimize use of straight lines or geometric shapes.

### **Channel Side Slopes**

- Provide channels with side slopes that are warped to provide a variety of rounded undulations designed to help break up the observers line of sight, create mystery points and visual interest along the banks. Provide slope gradients that vary from 4:1 to 12:1. Slope gradients should be limited to a maximum of 5:1 where opportunities for providing turf planting are desired. Provide a minimum of 4 to 8 undulations (in and out) on each side slope for every mile of channel reach.
- Provide curvilinear vertical walls or combinations of curvilinear walls and warped slopes to create visual variety in channels with narrow rights of way. Provide vertical wall forms, colors and textures that are consistent with the established landscape theme or setting in which the channel is situated.
- Meander the alignment of O&M access roads located on channel side slopes with the topographic undulations. Limit road grades to a maximum of 5% to provide opportunities for recreation multi-use.
- Provide channel component structures such as inlets, outlets, spillways and energy dissipaters that blend with and are integrated into the topographic form of the side slopes.

### **Channel Bottom Areas**

- The toe of side slopes (perimeter of the Channel bottom) should be freeform and meander inversely with the meander of the top of the side slopes.
- Channel bottom areas should be graded to provide rolling topography, terraces, or a combination thereof wherever possible, and provide positive drainage for all areas.
- Rolling topography should have relief that varies a minimum of 3-5 feet vertically to create effective visual variety in the topographic form of the basin bottom.
- Terraces should be freeform in shape and variable in width, length and vertical elevation within the channel bottom areas, while maintaining the required hydraulic capacity of the channel. The size of the terraces should be responsive to the physical requirements of any identified recreation multi-uses. Terraces should have finished elevations that are higher than 2-year nuisance flows and short term storm events (5-10 year) to provide for recreation multi-use opportunities.
- Provide a low flow channel of variable width that meanders from side to side within the bottom area to create spatial variety and visual interest. Provide a low flow channel whose overall form, colors textures, materials (sands, gravels, river rock, boulders, etc) and flow characteristics emulate the attributes of a natural stream channel. Provision of split flows or “braided” sections separated by mounded “islands” is desirable. Provide low flow facilities with a variety of flow characteristics, including slow moving quiet water, to rapid moving water to splashing noisy water, by varying the width, curvature, grade and texture of materials used in the construction of the low flow facility. Additional aesthetic treatment (materials, forms, colors, etc) of the low flow facility should be consistent with the landscape setting or the established Landscape Theme for the Channel.
- Provide ponds or other water features within channel bottom areas where opportunities exist. Ponds and water features should have a freeform shape. Inlet and outlet component structures of ponds and other water features should be designed to be consistent with the landscape setting or the established Landscape Theme for the Channel.
- Provide for O&M roads within the bottom area that are meandering, visually related to the contours of the bottom area, and responsive to the established landscape theme. Design O&M roads to provide accessibility for recreation multi-uses. Provide O&M road crossings of the low flow facility to enhance recreation multi-use opportunities. Ensure that O&M road crossings of the low flow facility occur at right angles to minimize crossing lengths, visual impacts, construction costs and maintenance requirements.

### **On-site Disposal of Excavation Material**

- Utilize excavated earth materials on site adjacent to the channels, wherever possible, to create a rolling upland park-like hillscape to minimize haul costs of excavated materials and enhance aesthetic values.

**Channel Orientation**

- Physically orient channels to provide recreation multi-users with views of primary landscape focal points, wherever opportunities exist.

**Scenic Features Preservation**

- Preserve and/or enhance on-site natural and cultural features that positively contribute to the character and scenic quality of the project area and its surrounds.

**Structural Components**

- Provide structural components such as grade control drop structures, spillways, energy dissipaters, inlets, outlets, and side weirs that blend into the topographic form of the channel and are consistent with the established landscape theme through use of appropriate materials, colors, scale, and forms. For example, provide natural looking drop structures where appropriate to the setting, and arched and stepped drops as opposed to baffle block designs wherever possible.
- Incorporate use of existing on-site materials in the design of the channel and its structural components wherever possible.
- Favor soft structural (earthen) over hard structural methods (concrete) to achieve the function of the structural components of Channels wherever possible.
- Avoid locating above ground structural components within key focal point areas of the project site.
- Provide structural components whose form can also serve recreation multi-purpose functions wherever possible.

**Vegetation Planting and Surface Treatment**

- Provide for landscape planting and treatment of the entire site, including the Channel, peripheral areas, and any other portions of the site or property.
- As a general rule, provide mature tree cover canopy for a minimum of 30%, shrub cover for a maximum of 20%, and herbaceous ground cover plant materials for the remainder of the ground area of channels.
- Provide an overall arrangement and composition of plants and other landscape materials that creates spatial variety, enframes important views, screens or softens the appearance of hard structural components and negative features in the surrounding landscape, and emulates the character and landscape compositions associated with natural riparian rivers and washes in the Southwest.
- Utilize a plant palette that is consistent with the established Landscape Theme or landscape setting of the Channel facility.
- Provide boulders, river rock and gravel surface treatments in combination with vegetation planting that is consistent with the established landscape theme for the channel site. Plant all boulders a minimum of 50% of their mass in the ground with the weathered (non-fractured) side up to achieve a natural appearance.
- Provide for salvage and re-establishment of indigenous vegetation, giving first priority to slow growing native species over fast growing types, where costs can be justified and environmental mitigation credits can be obtained.
- Provide accent plantings and other aesthetic features, as appropriate, for all identified on-site focal point areas, multi-use entryways and nodal areas.
- Utilize and design planting and other surface treatments for environmental mitigation purposes, erosion control, and dust abatement to meet landscape aesthetics project objectives, wherever possible, and conserve and maximize the use of established cost ceilings for landscaping and aesthetic treatments of flood control projects.

- Emphasize use of low maintenance landscape planting themes and irrigation systems in locations where the District will have landscape maintenance responsibility. Minimize use of plant materials, especially turf grasses, that will require mowing, unless required for erosion protection. Utilize vegetation species that will require little, if any, watering after initial planting. Utilize tall pot planting techniques and alternative methods of irrigation, such as application of DriWater, where appropriate, to reduce initial and maintenance costs for landscaping.
- Limit cost estimates and expenditures for vegetative planting to the amounts established in the most recently updated cost-ceiling tables contained in the appendix of the District's approved Policy for the Aesthetic Treatment and Landscaping of Flood Control Projects.

**Aesthetic Treatment Priorities**

- Utilize the following as guidelines for priority selection of aesthetic features where right of way, funding or other constraints preclude inclusion of all of the above aesthetic features in the design of the superstructure of channel facilities:
  - Where funding limited, give priority to acquisition of right of way for incorporating aesthetic features over expenditure of funds for planting and irrigation systems.
  - Where available right of way is limited, utilize the following for prioritizing the selection of aesthetic features to incorporate into channel projects:
    1. Peripheral area set back and buffer zone
    2. Providing an overall freeform shape
    3. Slope warping
    4. Topographic variations in basin bottom areas

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