

RAINBOW VALLEY

Area Drainage Master Plan

Contract FCD 2006C029

Data Collection Report



Submitted to



Submitted by

URS

in cooperation with



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Data Collection Report

for the

Rainbow Valley Area Drainage Master Plan Maricopa County, Arizona

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Disclaimer

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LIST OF ACRONYMS AND ABBREVIATIONS

ADMP	Area Drainage Master Plan
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AMA	Active Management Area
Arizona Register	Arizona Register of Historic Places
ASLA	American Society of Landscape Architects
ASLD	Arizona State Land Department
AZGS	Arizona Geological Survey
BLM	U.S. Bureau of Land Management
CFM	Certified Floodplain Manager
DDMSW	Drainage Design Management System for Windows
District	Flood Control District of Maricopa County
EEC	Engineering and Environmental Consultants, Inc.
FEMA	Federal Emergency Management Agency
FPM	flood protection method
GIS	geographic information system
InSAR	Interferometric Synthetic Aperture Radar
LIA	Landscape Inventory and Analysis
MAG	Maricopa Association of Governments
MPD	Maricopa County Planning and Development
MrSID	multiresolution seamless image database
National Register	National Register of Historic Places
NRCS	Natural Resource Conservation Service
PAAC	Project Aesthetic Advisory Committee
P.E.	Professional Engineer
P.G.	Professional Geologist
P&R	Maricopa County Parks & Recreation
RLA	Registered Landscape Architect
UPRR	Union Pacific Railroad
USGS	United States Geological Survey

EXECUTIVE SUMMARY

INTRODUCTION

The Rainbow Valley Study Area is an approximately 515 square mile area in Maricopa County generally bounded by Sierra Estrella Mountains on the east, Gila River on the north, South Maricopa Mountains on the south and the North Maricopa Mountains on the west. The City of Goodyear envisioned the potential for growth south of the Gila River in Rainbow Valley and pro-actively annexed large land areas in preparation for the expected growth. Prior to 2008 developers were assembling large land parcels in Rainbow Valley and beginning the development process. Concurrent to this, the Flood Control District of Maricopa County (District) had completed a number of studies in the area, including the Waterman Wash Study. The District recognized this area as challenging with respect to flood hazard identification and mitigation because of the unique flow characteristics found in the watershed including distributary flows, sheet flow, and alluvial fans. With the City of Goodyear and other municipal and agency project partners, the District pro-actively decided to evaluate existing as well as future flood hazards associated with the planned new development through the Area Drainage Master Study/Area Drainage Master Plan process. This entails updating the hydrology, floodplain delineations, developing and evaluating alternatives, and selecting a preferred alternative for implementation. Implementing this process prior to development occurring should reduce flood hazards through early planning of flood mitigation measures. In April 2008 the District contracted with the URS team to prepare the Rainbow Valley Area Drainage Master Plan (ADMP) under contract FCD 2006C069.

There are two major objectives that are specified in the Scope of Work that the ADMP should accomplish:

1. The ADMP should mitigate identified flood hazards through the development of a multi-objective regional plan that addresses the 100-year storm event.
2. Goals and objectives will be identified that are congruent with the District's mission statement and needs and wants of the agency stakeholders.

The ADMP is divided into 3 major tasks:

- Data Collection
- Alternatives Analysis
- Development of the Recommended Plan

Each of these major tasks includes updating data, special reports, and developing special techniques, some new to the ADMP process. The ADMP is multi-disciplinary and implements the District's Context Sensitive Flood Hazard Mitigation (CSFHM) approach. Acceptance of the ADMP by public and private stakeholders is an important portion of the CSFHM approach. Collaboration and coordination with public agencies stakeholders, municipalities, and developers and presenting proposed alternatives and solutions to the general public is integral in developing and implementing the plan.

DATA COLLECTION

The project study area includes the City of Goodyear, City of Avondale, Town of Buckeye, unincorporated Maricopa County, and the Gila River Indian Community. In addition to the Waterman Wash Watershed the study area includes a drainage divide on the south with portion of the Vekol Wash Watershed and portions of Avondale and Goodyear in the north that drain directly to the Gila River.

Four stakeholder meetings occurred as part of the ADMP process. Stakeholders included the cities of Goodyear and Avondale, Town of Buckeye, Maricopa County Parks and Recreation Department, Maricopa County Department of Transportation, District, Maricopa County Planning and Development, Arizona State Land Department, Arizona Department of Transportation, Maricopa Association of Governments, Arizona Game and Fish Department, and the US Bureau of Land Management. At the first meeting stakeholder goals and objectives were determined. The goals and objects were divided into 4 categories:

- Flood hazard protection
- Multi-purpose benefits
- Regional land planning compatibility
- Implementation

Additional efforts were made to clarify the goals and objectives. This included individual meetings with agency stakeholders. The URS team met with some of the larger property owners in the study area to obtain development information; introduce the project to them, and receive feedback.

Three locations were identified as having experienced flooding in the study area. One of the areas was a dip crossing of Waterman Wash and 99th Avenue; one was a low intersection along SR 238 and 91st Avenue, and the third was various wash dip crossings of SR 238.

New rainfall data developed by the National Oceanic and Atmospheric Administration (NOAA) and higher resolution topographic data was used to update the hydrologic model for Rainbow Valley. The updated rainfall data is less than used in the previous study, so runoff, flow rates in washes and in Waterman Wash (The Waterman Wash 100-year peak discharges reduced by approximately 60 percent.) are significantly less than previously used in floodplain delineations and drainage designs in the study area. The updated data was used in evaluating flood hazards and selecting alternatives. New FEMA floodplains were delineated using the updated data including an update of Waterman Wash. The hydrologic model results were used to determine the effectiveness of flood control alternatives.

Flood hazards in Rainbow Valley were identified by reviewing landforms and developing a flow characteristics map of the watershed. The major flow characteristics identified include:

- Major river and tributary flow
- Piedmont sheet flow
- Piedmont distributary flow
- Alluvial fans
- Piedmont tributary flow
- Disturbed areas
- Mountains

The flood hazards associated with piedmont distributary flow and sheet flow were stressed in developing the plan because present regulatory criteria does not provide measures that expressly mitigate flooding in these areas. Alluvial fans would fit in this category also, but the District is developing methodologies specific to this flood hazard separate from this ADMP. A methodology for evaluating the level of flood risk was developed for alternative analysis that overlaid the flow characteristics as compared against the future land use densities and intensities. The results were used to determine if an area has a high, medium, or low flood hazard risk when developed in accordance with the known municipal and county general plans.

As part of the data collection task the geologic setting was established, drainage facilities, major utilities, and major land holdings were inventoried for future use in evaluating alternatives. Cultural and ecological assessments were prepared that included structural type and flood control compatibility. Similarly compatibility evaluations were prepared for the open space, parks and recreation, and scenery resources. Opportunity and constraint maps were developed for each of the above factors to be used as tools for evaluating the compatibility of flood control alternatives.

ALTERNATIVES ANALYSIS

The alternatives analysis was a collaborative effort between the District, agency stakeholders, and the URS team. The process began with the combination of the opportunities and constraints mapping described above into maps that identified the compatibility of the underlying resources with common flood hazard protection structures and methods used by the District. These combined compatibility maps were also referenced with the flood risk mapping in order to identify areas where similar flood mitigation strategies could be implemented. The URS team selected a suite of flood mitigation strategies that were derived from FEMA guidelines, and deemed suitable for developing context sensitive solutions. Floodplain management strategies that were considered include:

- Modifying susceptibility to flooding
- Modify flooding
- Modify the impacts of flooding
- Protect and restore functions and values of floodplains

An initial meeting occurred between District staff and the URS team to develop seed ideas based on applying either one or a combination of the floodplain management strategies to areas with similar flood risk, flood protection structure and method compatibility rankings, and land management. These initial seed ideas were refined and presented to agency stakeholders. Then at an Agency Stakeholder Meeting these seed ideas were expanded upon and additional ideas formulated. The results were six (6) preliminary alternatives derived from the floodplain management strategies and applied to fourteen (14) planning units, with each planning unit having similar flow characteristics, land management and planning criteria. The alternatives included:

- No new actions
- New or modified regulations
- Structural conveyance
- Structural storage and transportation corridors
- Protect significant wash corridors
- Pocket basins

Each alternative was reviewed for acceptability by the community, compatibility with the land and resources, and effectiveness in mitigating flooding, as well as opportunities, constraints,

relative cost, strengths, and weaknesses. The URS team reviewed the likely outcomes if the 6 alternatives were implemented in each of the planning units and qualitatively decided whether it would have a positive impact on mitigation of the flood hazard. It was determined that no new actions are required in areas where flood risk was low and no significant new development is expected such as the Sonoran Desert National Monument and Estrella Mountain Regional Park that are already protected from development. Each planning unit was also evaluated considering the stakeholder goals and objectives and the combined compatibility ratings.

The results were presented to the stakeholder in a meeting and they were provided with a process for evaluating and scoring each alternative for each planning unit. The results of the scoring were then evaluated and given a context sensitivity rating that was based on the overlap area of acceptability, compatibility, and effective in relation to the three context categories of the CSFHM approach. Implementation and cost were also included as factors. The results concluded that costly regional structural alternatives would not be the most context-sensitive tool for mitigating flooding in Rainbow Valley. Instead, while existing regulations would not be effective in achieving a context-sensitive flood hazard mitigation in areas of special flow characteristics (sheet flow, distributary flow, and alluvial fan landforms) modified regulations would be able to provide effective, compatible flood hazard mitigation and should be developed. In tributary flow and preservation areas it was concluded that existing regulation would suffice. Also, using significant wash corridors to maintain flow paths to Waterman Wash would provide for effective flood conveyance and, if protected by new regulatory means, would be compatible with the setting and acceptable to the community.

The results of the evaluation led to the following recommended alternative for each of the 14 planning units.

Planning Unit	Dominant Flow Characteristic	Recommended Alternative
PIR	Tributary Flow	No New Action
Lum Wash	Tributary Flow	Designated SWC*
Estrella	Sheet Flow	Modified Regulation and SWC*
Sonora	Distributary Flow	Modified Regulation and SWC*
Sevenmile Mountain	Secured Open Space	No New Action
Secured Open Space – East	Secured Open Space	No New Action
Secured Open Space – West	Secured Open Space	No New Action
Mobile	Mixed Flow	Designated SWC*
Waterman South	Mixed Flow	Modified Regulation and SWC*
Waterman Wash Segments 1-5	Riverine Flooding	Designated SWC*

*SWC – Significant Wash Corridor

RECOMMENDED PLAN

The ADMP recognizes that a holistic approach was needed to meet the context-sensitivity goals and requirements for Rainbow Valley. A watershed resource approach naturally lent itself to this purpose. In developing the criteria for this approach the URS team identified basic watershed functions, performance functions, and design criteria that are important in maintaining continuity from the mountains to Waterman Wash. Of equal or greater importance was identifying criteria for modifying regulations to preserve these functions while also mitigating flooding in the special flood hazard areas such as for sheet flow (Estrella Planning Unit) and distributary flow (Sonora Planning Unit) where significant portions of the future development is expected to occur. The basic watershed functions identified include:

- Runoff volume
- Peak discharge
- Flow continuity
- Storage
- Sediment continuity
- Sediment transport
- Scenery resources
- Multi-use opportunities
- Open space
- Biological resources
- Cultural resources

Supporting performance functions were selected that establish goals or outcomes that the ADMP should strive for when evaluating the basic functions. These goals or outcomes should be in conformance and acceptable to agency stakeholders, the development community, and the public. General and specific design criteria were then established in order to benchmark success or failure. Modification to existing policies, guidelines, and ordinances (PGOs) are recommended to implement the general and specific design criteria because in many instances the recommended PGOs are either different or a variation of the PGOs that exists today. Largely due to the predominance of the ADMP land area currently situated within the City of Goodyear municipal limits and the large assemblages of developable parcels to develop under Goodyear regulations, the City of Goodyear was selected to determine where PGOs could most likely be updated to implement the suggested changes in design criteria. A roadmap was developed that

illustrates and explains where the City of Goodyear presently regulates the functions and criteria in regard to the following regulatory documents:

- General Plan
- Zoning Ordinance
- Engineering Design Standards and Policies Manual
- Design Guidelines
- Subdivision Regulations
- Flood Damage Prevention Code

In many cases there were multiple citations where the function or criteria were referenced in each of these documents. Close coordination with the City of Goodyear is imperative in determining the appropriate balance and combination of PGOs that are sensible, adoptable, equitable, and enforceable will be important next steps in implementation. The ADMP includes a white paper in the appendices that outlines a variety of potential ways and combinations of ways in which this could be accomplished.

A series of typical design examples were prepared that show the results of modifying development practices consistent with the performance functions and design criteria recommended in the ADMP. A two dimensional hydraulic model was used to compare the impacts of existing regulations on the sheet flow and distributary flow areas in the piedmont landform. Then a modified development scenario can be used in design. The design could include both landform preservation corridors and maintaining overall lot density through clustering and lot size reduction techniques. When comparing natural conditions with the two development practices it was shown that developments using the modified criteria that include preserving open space corridors are more compatible with the natural environment and will have reduced negative impacts on downstream flood hazards. The results are discussed in more detail in the ADMP (Section 3.4).

The ADMP also discusses the need for significant wash corridors and their importance in maintaining the functionality of the watershed. Typical cross-sections, erosion hazard setback zones, floodplains, and recommended development and design guidance are included with this alternative.

As the axial stream of the watershed, Waterman Wash is a special case Significant Wash Corridor. Both general and reach-specific design criteria were developed for Waterman Wash. Updating the floodplain and floodway using the revised hydrology is a project that is presently

being implemented. Both the floodplain and floodway have a smaller footprint than the effective information shown on the 2005 FEMA Digital Flood Insurance Rate Maps (DFIRM). The proposed revised analysis also considers the impacts that occur when development encroaches to the floodway limit (which is allowable in Goodyear's and Maricopa County's flood damage prevention codes). The loss in floodplain storage this would cause was factored when calculating the allowable surcharge above the base flood elevation. The surcharge is less than the maximum allowable 1 foot in many locations along Waterman Wash.

The ADMP also recommends removing agricultural non-levee embankments that are located between river miles 8 and 14. Removal of the agricultural embankments will reduce the base flood elevation (flood hazard risk) in these reaches which also increases the developable land to the property owner.

The ADMP discusses other performance parameters including road crossing criteria that include wildlife and trail crossings, erosion hazard zones, protecting the dominate discharge channel cross-section and minimizing vegetative impacts, and the need to minimize the road footprint by reducing the skew angle of roads crossing Waterman Wash.

There are areas adjacent to Waterman Wash where agricultural practices have significantly impacted the natural character of the watershed. In these areas the ADMP recommends that the city and county jurisdictions work with the developers and the departments of transportation (ADOT and MCDOT) to identify and reserve flow corridors where flow from upstream piedmont areas, major roadways (proposed Loop 303 and Sonoran Desert Parkway), and development can connect. These proposed corridors would outfall to Waterman Wash.

Implementation of the modified regulations and Significant Wash Corridors is important to the success of the ADMP. As presented earlier a White Paper and PGO Roadmap were developed to describe how the ADMP could be implemented by the City of Goodyear. The ADMP also includes a flowchart that generally provides a prototypical implementation procedure. There are other stakeholders that either have jurisdictional responsibility or ownership of property in the study area. These include:

- City of Avondale
- Town of Buckeye
- Unincorporated Maricopa County
- BLM
- Gila River Indian Community

- Arizona State Land Department
- Private Developers
- Others

These stakeholders will need to be included in future discussions on the implementation of the ADMP.

Plan validation is an important step in garnering support of the ADMP to stakeholders. Hydrologic modeling and other methods were used with various amounts of success when evaluating the ADMP on a watershed basis. The validation results are discussed in the ADMP for each of the basic watershed functions. Comparisons are made between the natural (existing) condition, future condition utilizing existing regulations, and implementing the design criteria recommended in the ADMP. Overall the results showed that the ADMP improved attaining conditions similar to existing conditions and reduced the impacts of present development practices. The ADMP did show success in managing flood hazards, providing context sensitive development, and reducing the potential future need for structural flood control related capital improvement projects (CIP). The exceptions (could be CIP projects) include removing the non-levee embankment from the floodplain of Waterman Wash and providing flow corridors in the disturbed agricultural areas.

CONCLUSIONS

The following general conclusions result from the data collection, analysis, and stakeholder involvement activities conducted as part of this Rainbow Valley ADMP. The conclusions are supported by the documentation presented in the ADMP Report.

1. There are significant portions of the Waterman Wash watershed that exhibit landforms associated with unique flood hazards that are not adequately addressed by conventional land development regulations. These include the alluvial fan, sheet flow, and distributary flow areas.
2. While the Waterman Wash watershed is relatively natural and undeveloped at the present time, existing land use plans indicate the potential for extensive land development activities within portions of these unique landform areas over the next 10 to 20 years and beyond.
3. Conventional approaches to flood control characterized by diverting, concentrating, and storing runoff are expected to result in excessive flood risk to residents and property when development expands in these unique flood hazard areas. These risks result from the impacts of development on important natural watershed functions.

4. Although these risks may be partially mitigated on an individual project basis, they are compounded when considered cumulatively throughout the watershed. As a result, comprehensive development practices are needed that will mitigate the loss of watershed functions that are important for stability of the piedmont surface and preservation of the quality of life and public health and safety.
5. The Waterman Wash watershed contains a near pristine natural Sonoran desert ecosystem that covers multiple landforms, from the protected mountain areas that form the watershed headwaters to the vulnerable but significant riparian washes. This ecosystem includes a variety of native vegetation that supports a varied population of desert wildlife species. This ecosystem also provides the opportunity for multiple recreation activities for residents and visitors. The natural desert environment has been identified as a valuable resource to be preserved to enhance the quality of life by future residents.
6. Since the watershed is still relatively natural and undisturbed, an opportunity exists to guide development practices in order to maintain the important natural watershed functions to a significant extent. This could occur by integrating new development into the natural watershed functional matrix rather than replacing it.
7. The plan presented in this report, if implemented, would partially mitigate the adverse flood risk associated with conventional development practices in unique flood hazard areas and would preserve watershed functions needed to support native vegetation and wildlife.
8. Changes to existing policies, guidelines, and ordinances will be required to implement the plan presented in this report.
9. Acceptance of the plan in its entirety has not yet been clearly established by the City of Goodyear or the development community.

RECOMMENDATIONS

Based on the foregoing conclusions, the following recommendations are made for implementation of the plan.

1. The District should follow up with project stakeholders to review the plan and seek acceptance and adoption of the plan.
2. Upon plan acceptance and adoption, the District should develop Intergovernmental Agreements between stakeholder groups to establish the means for implementation.

3. Ideas that have been identified as possible means for implementation that should be explored include:
 - a. Formation of Drainage Districts to enable coordination between developments within a sub watershed of Waterman Wash.
 - b. Inter-Agency discussions to coordinate improvements between the Loop 303 and potential outfall alignments through the disturbed areas.
 - c. Development of a CIP project for removal of the Waterman Wash agricultural levees
 - d. Development of a conservancy advocate group to promote watershed-based planning and design
4. The District should work with regulatory jurisdictions to develop ordinances to establish Erosion Hazard Zones and SWCs as well as other regulatory tools needed to fully implement the plan.
5. The floodplain administrator should prepare detailed floodplain and floodway studies for all identified SWCs.
6. The transportation circulation portion of municipal General Plans should be updated to identify preferred road alignments that are coordinated with drainage patterns and minimize crossings of drainageways.

1.0 INTRODUCTION

This Data Collection Report was prepared for the Flood Control District of Maricopa County (District) as part of the Rainbow Valley Area Drainage Master Plan (ADMP). The Rainbow Valley area was previously studied for the Waterman Wash Floodplain Delineation Study (Contract FCD 2002C024). The Rainbow Valley ADMP project employs the flood hazard information developed in the floodplain delineation study as the basis for developing a flood hazard mitigation strategy that developers, property owners, and jurisdictions can use as a guide. This Data Collection Report is the culmination of the first step of the ADMP and will be used to formulate and evaluate potential flood control alternatives. The study area is shown on Figure 1-1.

1.1 PURPOSE

The initial goal of this study is to determine the location, cause, and extent of flooding in the Rainbow Valley study area. Once these parameters have been identified, a context-sensitive flood hazard solution will be developed for existing and future development. The study will draw upon and update existing flood studies and drainage plans to evaluate flood control measures. In areas that have not been studied or where the data are inadequate, additional analysis will be performed to make sure the results are up-to-date and consistent throughout the study area. An alternatives formulation and analysis process will then be used to identify the recommended plan. That plan will balance flood control measures with sensitivity to the area's land and resources by considering cultural, biological, scenic, open space, and recreational opportunities and constraints. Agency and private stakeholders and the public will have many opportunities for collaboration and input during alternatives analysis and plan development, thereby assuring that the recommended plan will meet the needs of the public and be implementable.

The project must accomplish the following two major objectives:

- Mitigate identified flood hazards through the development of a multi-objective regional plan that will address the 100-year storm event. The recommended plan will maximize opportunities to protect and restore the natural and beneficial functions of the floodplain while taking full advantage of the natural and physical characteristics of the existing and planned landforms, water features, wildlife, scenery, open space, and cultural, recreational, and development opportunities.
- During the data collection phase of the study, goals and objectives will be identified that are congruent with the District's mission statement and the needs and wants of the agency stakeholders. The goals and objectives of the agency stakeholders were obtained through

an initial agency stakeholder meeting at the beginning of the project and in subsequent individual stakeholder meetings. Input from private stakeholders and the public will provide additional important information relative to selecting a recommended plan.

1.2 SCOPE OF PROJECT

The URS Team is providing professional engineering and other professional services necessary to develop an ADMP for the Rainbow Valley study area. The work is being performed under Contract FCD 2006C029 and includes the Waterman Wash watershed and some outlying areas that flow east toward the Estrella Mountains and north to the Gila River. The project is multidisciplinary and will develop a multipurpose, context-sensitive flood hazard mitigation strategy. The project will focus on attaining the goals and objectives set forth in the District's mission statement and will provide guidelines to agency and private stakeholders and to the public for developing projects within the study area. Input from these sources will be used to develop a plan that will be accepted and implemented in a timely fashion.

An important aspect of the project is to identify flood hazards and control development in flood-prone areas. Both alluvial fan and riverine floodplain delineations are included in the project to identify and set specific regulations in some of these locations. The major tasks included in the scope of work follow:

1. Data Collection and Review

- Right-of-Way Identification
- Regulatory and Hazardous Waste Location Identification
- Cultural and Historical Assessment
- Biological Assessment
- Section 404/Jurisdictional Assessment
- Geological and Geotechnical Assessment
- Scenic and Open Space Assessment
- Recreation Opportunities Assessment
- Land and Resources Compatibility Assessment

2. Hydrology

- Flood Hazard Assessment
- Review, Analysis, and Revisions to the Existing Hydrology Model
- Vekol Wash Diversion Assessment
- FLO-2D Analysis for Split Flows
- Alluvial Fan Identification

- Revised Existing Conditions Model
- Future Conditions Model
- Hydrologic Impacts and Proposed Alternatives
- Hydrologic Impacts and Recommended Alternatives

3. Hydraulics

- Hydraulic Analysis and Proposed Alternatives
- Hydraulic Analysis and Recommended Alternative
- Sediment Transport Analysis of Waterman Wash

4. Floodplain Delineations

- Twenty-Five Alluvial Fan Floodplain Delineations
- Five Miles of Detailed Floodplain Delineations
- Twenty Miles of Approximate Floodplain Delineations
- Public Notifications and Meetings

5. Stakeholder and Public Meetings and Announcements

- Four Agency Stakeholder Meetings and Individual Meetings with Agencies
- One Private Stakeholder Meeting and Individual Meetings with Developers and Others
- Three Public Meetings
- Three Meetings with the Project Aesthetic Advisory Committee (PAAC)
- Project Website on District Website
- Public and Stakeholder Notifications Throughout the Project

6. Preliminary Alternatives Formulation and Analysis

- Seed Idea Meeting, Agency Stakeholder Meeting 2 (Brainstorming), Public Meeting 1, and PAAC Meeting 1
- Preliminary Formulation of Four to Five Alternatives
- Agency Stakeholder Meeting 3

7. Proposed Alternatives Analysis

- Planning Level Analysis of Four to Five Alternatives Including Magnitude of Cost, Fatal Flaws, and Comparison with Performance Criteria
- Agency Stakeholder Meeting 4 – Selection of the Recommended Alternative for Further Analysis
- PAAC Meeting 2 and Public Meeting 2

8. Recommended Alternative Analysis

- Identification of Opportunities and Constraints
- Conceptual Plan Development
- Development of Planning-Level Cost Estimates
- PAAC Meeting 3 and Public Meeting 3

1.3 STUDY AREA

The Rainbow Valley study area comprises the Waterman Wash watershed, a portion of the Vekol Wash watershed and adjacent land north and east of the Waterman Wash watershed that has not previously been studied by the District. The study area is bounded to the north by the Gila River, to the south by the South Maricopa Mountains and Interstate 8, to the east by the Sierra Estrella, and to the west by the North Maricopa Mountains. The study area is within the area bounded by approximately Township 1 South to Township 7 South and Range 3 West to Range 2 East (Figure 1-1). The study area covers approximately 515 square miles and includes unincorporated Maricopa County, the City of Goodyear, the City of Avondale, City of Maricopa, and the Town of Buckeye. Significant portions of the study area are controlled by the U.S. Bureau of Land Management (BLM), Arizona State Land Department, Maricopa County, and the Gila River Indian Community.

The Sonoran Desert National Monument is located in the southwestern portion of the study area, and the Union Pacific Railroad (UPRR) divides the southernmost portion of the study area from the north. Waterman Wash flows south to north and confluences with the Gila River in the Town of Buckeye (approximately Section 12/13, Township 1 South, Range 3 West). The Vekol Valley watershed was initially included in the southern portion of the study area to determine whether there was any inter-basin flow to Waterman Wash. Early in the study it was determined that the flow from the Vekol Valley watershed, if any, does not significantly contribute to the flood flows of the Waterman Wash and its tributaries during the 100-year storm event. Therefore, ADMP development did not extend to Vekol Valley. The jurisdictions and surface management within the study area are shown on Figure 1-2.

1.4 CONSULTANT TEAM

The URS team comprises five consulting firms with many years of experience developing area drainage master plans and floodplain delineations for the District in Maricopa County. URS is the prime consultant responsible for all aspects of the study. Dr. Elliot Silverston, P.E., is the project manager. Other key contributors are Marc McIntosh, P.E. (hydrology and hydraulics, floodplain delineations, and ADMP development), Dr. Gene Rogge (cultural and historical

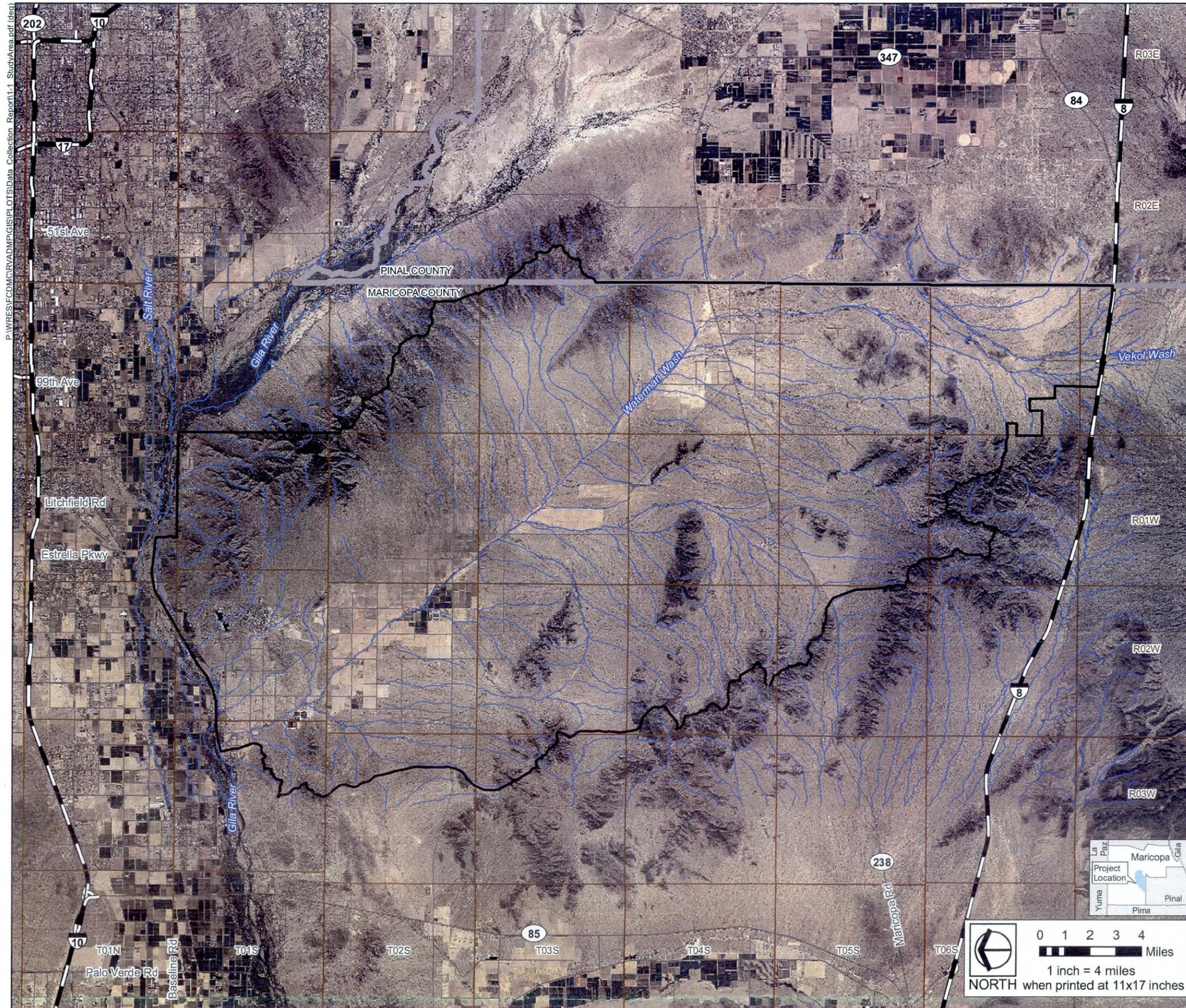
assessment), Dr. Robert DeBaca (biological assessment), Karen Modesto (geological assessment), Robert Pecha, R.L.S. (survey), Lyndy Long (public involvement), Marianne Burrus (environmental evaluation), Leslie Watson (Section 404 jurisdictional delineations), Robert Pankonin, RLA (right-of-way), Kyle Schafersman, P.E., CVS (Value Analysis Facilitator), and Jen Wennerlund (geographic information system [GIS]).

JE Fuller/Hydrology and Geomorphology, Inc. is responsible for the alluvial fan analysis (Jon Fuller, P.E., R.G., P.H., D.WRE, CFM and Mike Kellog, P.G.) and the coordination of the development of the ADMP process (Brian Fry, P.E., CFM). EPG is responsible for the scenic resources and for the open space and recreation assessments. Scott Peters, RLA, ASLA, and John Griffin, RLA, are the EPG leads. Dibble Engineering is responsible for the FLO-2D modeling and for the sediment yield analysis. Daniel Frank, P.E., is the project manager. Terracon Consulting Engineering and Scientists will perform the geotechnical field sampling and testing for the sediment yield and sediment transport modeling. Michael Smith, P.E., is their project manager. The Policies, Guidelines, and Procedures task is led by Kevin J. Kugler, AICP, at RBF Consulting.

Rainbow Valley
Area Drainage Master Plan
Study Area



Figure 1-1



Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector Data, 2008
Arizona State Cartographer's Office
NAIP Imagery, 2007

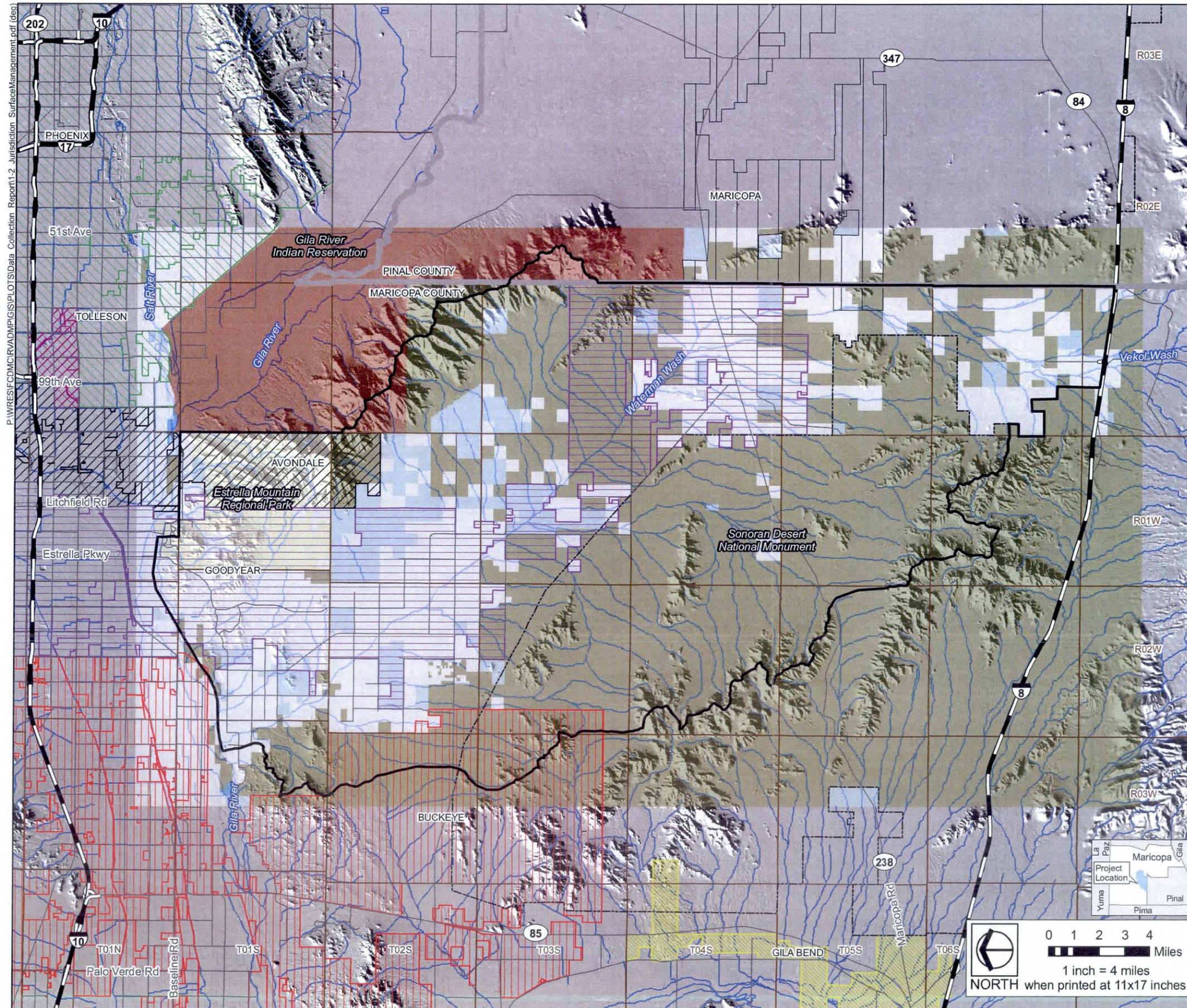
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Rainbow Valley
Area Drainage Master Plan
Jurisdictions and Surface Management



Figure 1-2



Project Features

☐ Sonoran Desert National Monument

City/Town

- ▨ Avondale
- ▨ Buckeye
- ▨ Gila Bend
- ▨ Goodyear
- ▨ Maricopa
- ▨ Phoenix
- ▨ Tolleson
- ☐ Unincorporated Area

Surface Management

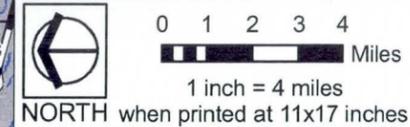
- ▨ Bureau of Land Management
- ▨ Gila River Indian Reservation
- ▨ State Trust Land
- ▨ Arizona Game and Fish Department (State Land)
- ▨ County, Park and Outdoor Recreation Area
- ▨ Private Land

Reference Features

- ▬ County Boundary
- ▬ Interstate Highway/Freeway
- ▬ Rainbow Valley ADMP Boundary
- ▬ Major Road
- ▬ Township and Range Boundary
- ▬ River/Stream

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008



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2.0 EXISTING CONDITIONS

2.1 INTRODUCTION

This section describes the study area in terms of the existing conditions at the time of this report. Descriptions of the geology, utilities, land holdings, and available mapping data will become the basis of the planning process.

2.2 GEOLOGIC SETTING

The 515 square-mile Rainbow Valley ADMP study area lies primarily in Rainbow Valley within the Basin and Range physiographic province. The Basin and Range province is an extensive area in the southwestern United States and northern Mexico that is distinguished by many isolated and roughly parallel mountain ranges that are separated by low-lying desert basins. This area is characterized by north-south-trending block-faulted mountain ranges and intervening desert valleys that are bounded by extensive alluvial fans or pediments (Anning et al. 2007).

The strata in the Rainbow Valley ADMP study area include igneous, metamorphic, and sedimentary rocks. Bedrock in the mountains surrounding the study area consists primarily of crystalline basement and volcanic rocks. The rock types are primarily Precambrian granite, gneiss, and schist, and Tertiary volcanic rocks. The Gila River flows near the northern extent of the bedrock as it traverses the northwestern part of the study area.

The Buckeye Hills are directly south of the Town of Buckeye in the far northwestern portion of the study area. Although some of the larger hills have more than 600 feet of relief above the surrounding plain, topographic relief is generally very low. The Buckeye Hills are composed primarily of three distinct granitic rocks: (1) coarse-grained granite, (2) medium- to coarse-grained granite, and (3) fine-grained granite. The Sierra Estrella, bordering the valley from southeast to northwest, rise to altitudes of as much as 4,000 feet above mean sea level.

Much of the bedrock has been severely eroded into low-relief pediments. From a distance these pediments resemble extensive alluvial plains. Several episodes of erosion, sedimentation, and entrenchment have resulted in dissected alluvial deposits across the pediments within the study area (Skotnicki 2002). South of the Buckeye Hills, a broad bajada, or series of coalescing alluvial fans, slope northward from the Maricopa Mountains toward the hills (Skotnicki 2002).

In the Maricopa Mountains, the pediment surfaces comprise outcrops and sediment derived from the granitic rocks (Reynolds and Skotnicki 1993; Cunningham et al. 1987). Weathered porphyritic granite has contributed to the angular, coarse, light-colored pavements on alluvial

surfaces in the study area. In the North Maricopa Mountains, most piedmont areas contain alluvium of the Middle to Late Pleistocene (Mauz 2004). Shallow bedrock surfaces of low relief are common in the piedmont areas.

The rocks that make up the surrounding mountains also form the lateral and underlying boundaries of the Rainbow Valley groundwater sub-basin. The Rainbow Valley ADMP study area lies primarily within the Rainbow Valley sub-basin of the Phoenix Active Management Area (AMA) groundwater basin. AMAs are areas of critical groundwater conditions where the use of groundwater is regulated. The far northwestern part of the study area between the Buckeye Hills and the Estrella Mountain Regional Park is within the west Salt River Valley sub-basin. The far southeastern corner of the study area, south of the Maricopa Mountains and north of Interstate 8, is within the Vekol Valley sub-basin in the Pinal AMA.

In the Rainbow Valley sub-basin, depth to bedrock is estimated at greater than 9,600 feet in the center of the basin and near the center of the Rainbow Valley ADMP study area, which is in the vicinity of Hunt Highway between Townships 2 and 3 South, Range 1 West (Openheimer 1980; Richard et al. 2007).

2.2.1 Geohydrology

Basin-fill aquifers are the principal source of groundwater for domestic and municipal supply and for irrigated agriculture in the Basin and Range province. The Rainbow Valley sub-basin is characterized by a gently sloping alluvial plain partly enclosed by the adjacent mountain ranges. The valley floor ranges in altitude from about 1,000 to 1,500 feet above mean sea level.

The valley is drained by Waterman Wash, with its headwaters in the southeastern part of the study area and flowing northwestward to the east of the Buckeye Hills into the west Salt River Valley sub-basin, where it joins the Gila River near Buckeye. The drainage area of Waterman Wash is approximately 420 square miles. It is an ephemeral stream and not a significant source of water.

The main source of water in Rainbow Valley is groundwater that is found under unconfined conditions within the basin-fill alluvial deposits (Stulik 1982). The general vertical sequence of sediments overlying the bedrock is (1) pre-Basin and Range rock, (2) lower and upper basin fill, and (3) stream alluvium. The basin-fill sediments that comprise the principal aquifer system consist of poorly sorted gravel, sand, silt and clay (Arizona Department of Water Resources [ADWR] 1994). Sources of groundwater recharge include streambed recharge from flood flows in Waterman Wash, mountain-front recharge, and incidental recharge from agricultural

irrigation. The lithology of the regional aquifer has not been well defined due to a lack of geological data.

2.2.2 Groundwater Conditions in the Rainbow Valley Sub-Basin

Groundwater in the Rainbow Valley sub-basin is primarily used for irrigation. Yields of wells in the alluvial deposits range from a few gallons per minute to more than 2,000 gallons per minute for irrigation wells.

Groundwater pumping in the sub-basin began in the 1940s with the advance of agriculture in the area. By 1952, continued pumping resulted in the decline of groundwater levels and the creation of a groundwater depression in the northwestern portion of the sub-basin (Stulik 1982). Although annual pumpage has declined from a high of 72,000 acre-feet in 1972 (Stulik 1982) to less than 7,000 acre-feet in 2002 (Rascona 2005), the groundwater depression was still evident based on groundwater level data as of February 2003. Depth to groundwater in January 2008 ranged from about 260 to 580 feet. In general, groundwater levels have been rising slightly since the late 1980s. Between 1997/1998 and 2002/2003, both rises and declines were measured within the sub-basin, ranging from a decline of 67 feet to a rise of 29 feet in that five-year period.

The ADWR has approved a large number of assured water supply applications for subdivisions planned within the sub-basin. As of June 2008, ADWR has issued analyses of assured water supply for approximately 45,000 lots, with an additional 5,574 lots pending approval. The projected demand associated with the planned developments is estimated at 30,000 acre-feet per year (ADWR 2008). This represents a projected 400 percent increase in groundwater withdrawals. That estimate of future use of groundwater resources within the sub-basin is further supported by information in Goodyear's *Integrated Master Plan* (City of Goodyear 2007a). That document established that 51,520 acre-feet per year of groundwater would be withdrawn from the Rainbow Valley sub-basin aquifer when the area is fully developed (Black & Veatch 2008).

2.2.3 Potential for Land Subsidence in the Rainbow Valley ADMP

The relationship between groundwater level decline and subsidence in sedimentary basins in Arizona is complex and varies within and between basins as a function of total aggregate thickness, composition, and compressibility. The centers of many basins within the Basin and Range province often have thick sequences of clay (Anderson et al. 1992); however, the lithology of the regional aquifer in Rainbow Valley sub-basin has not been well defined due to a lack of geological data for that section of the AMA.

Despite the history of groundwater withdrawals for intensive agricultural irrigation in the sub-basin and in the northwestern part of the Rainbow Valley ADMP study area in the early 1970s, only a minimal amount of land subsidence has been measured in the study area compared to other areas. Recent analysis of current Interferometric Synthetic Aperture Radar (InSAR) data shows that most of the subsidence has been 0.5 centimeter or less over a one-year period (Conway 2008).

The lack of more significant subsidence could be explained by the comparatively limited amount and distribution of fine-grained silt and clay sediments within the basin-fill sediments in the areas of greatest water-level decline. However, because the lithology of the regional aquifer within the sub-basin is not well defined, only a tentative evaluation and explanation of the minimal historical occurrence and determination of the potential for new subsidence are possible.

The current subsidence is limited to agricultural areas where groundwater has been pumped for irrigation. Future groundwater withdrawals to support the projected increase in population may result in additional subsidence problems in other areas within the sub-basin, subject to local hydrogeologic conditions. Because fine-grained units of silts and clays may not be continuous or widespread within the Rainbow Valley ADMP, the amount of subsidence may continue to be minimal or local. Additional evaluation is needed to predict other potential subsidence areas.

2.3 DRAINAGE FACILITIES

Existing drainage facilities within the study area were identified during the field reconnaissance or through review of collected data and information and are shown on Figure 2-1. Results showed that most of the Rainbow Valley ADMP study area is rural and undeveloped, but the north-central portion of the study area has been developed as part of Estrella Mountain Ranch. The drainage facilities in that development include storm drains, channels, culverts, and retention basins. The UPRR bisects the south-central portion of the Rainbow Valley ADMP study area and acts as a large dam/levee. During data collection, an additional railroad track and embankment were under construction parallel to the UPRR. New culvert crossings had been installed for the new track along the same alignment as the old railroad culvert. The existing culverts and wooden trestle bridges are being replaced with steel pipes and concrete headwalls.

2.4 MAJOR UTILITIES

Major existing utilities are shown on Figure 2-2. With the exception of Goodyear, most of the study area proved to be undeveloped and to lack major utilities. Several overhead high-voltage transmission lines bisect the northern portion of the study area, and two high-pressure natural gas pipelines cross the site along the Komatke Road alignment. The transmission lines are owned by

various entities. The gas pipelines are owned by El Paso Corporation. The locations of major utilities, including water and sewer alignments greater than 24 inches in diameter, are shown on Figure 2-2.

2.5 MAJOR LAND HOLDINGS

Major land holdings in the study area were considered to be holdings of 160 acres or more, and their owners were identified from information provided by the District. The study area has 65 major landowners; a list of those owners and their holdings can be found in Appendix B. The major landowners and their holdings are shown on Figure 2-3.

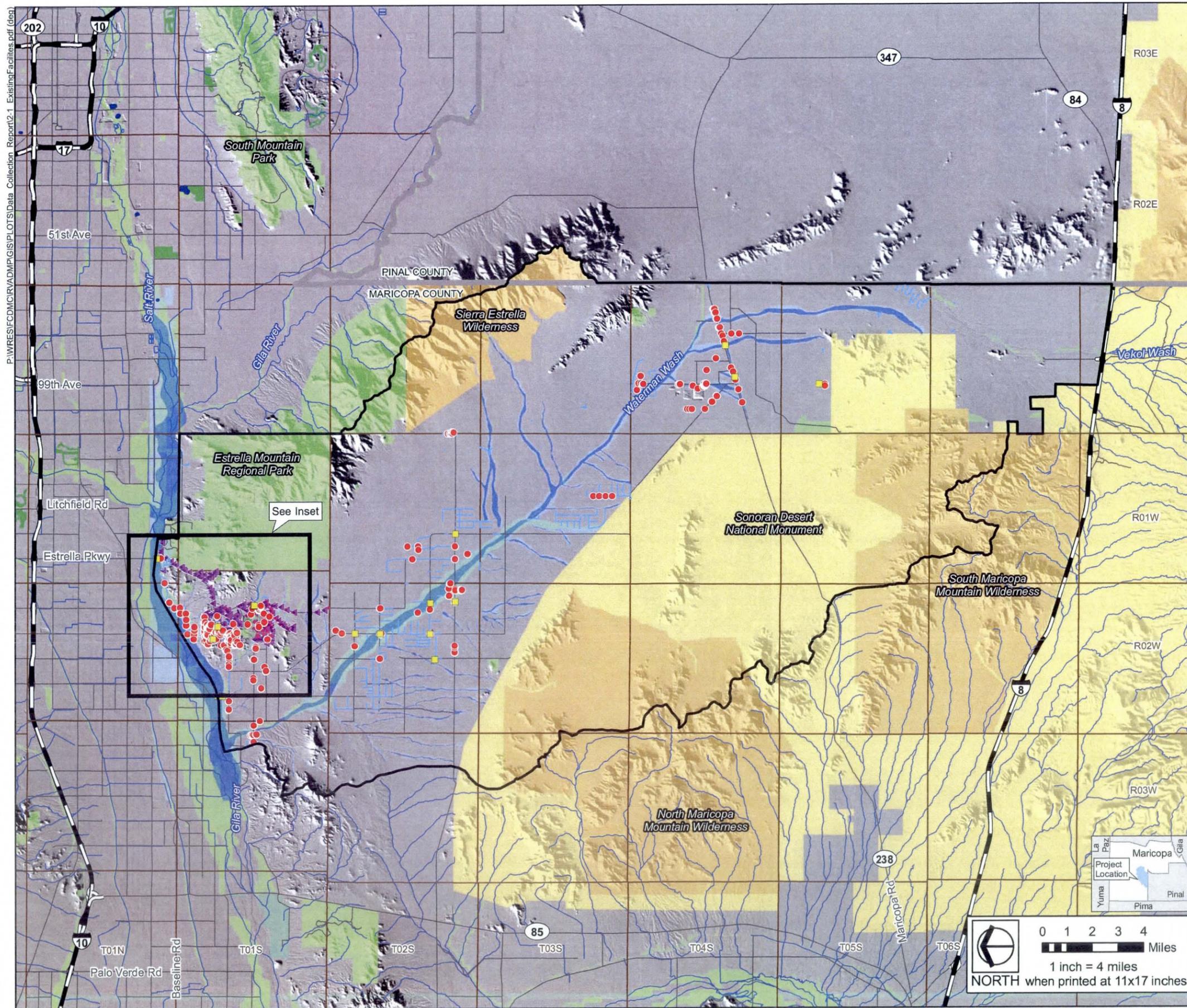
2.6 EXISTING MAPPING AND SURVEY DATA

The District provided 2-foot and 10-foot contour mapping of the study area which was developed in March 2005 and December 2000, respectively. In November 2006, Stewart Geo-Technologies took aerial photographs, saved as multiresolution seamless image database (MrSID) images, and performed mapping of the study area. The vertical datum for the study area is NAVD88. The horizontal datum is NAD 1983. Figure 2-4 shows the extent of the topographic mapping of the survey area.

Rainbow Valley
Area Drainage Master Plan
Existing Facilities



Figure 2-1



Project Features

Existing Facilities

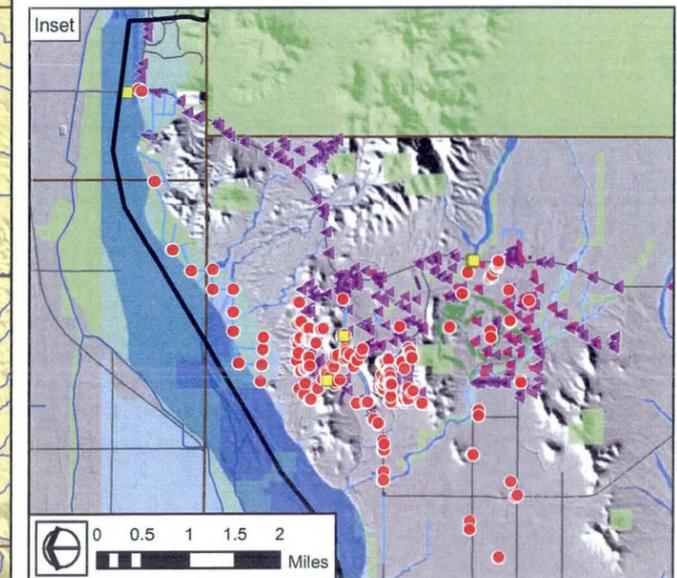
- Bridge
- Culvert
- Storm Drain
- Canal
- Storm Drain
- Lake/Pond

Floodplain Data

- 1% Annual Chance Floodplain
- Floodway

Recreation Areas

- Wildlife Area
- National Monument
- Wilderness Area
- Park/Preserve/Open Space
- Golf Course

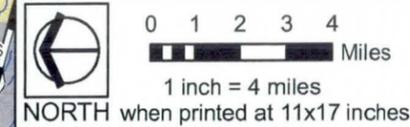


Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008

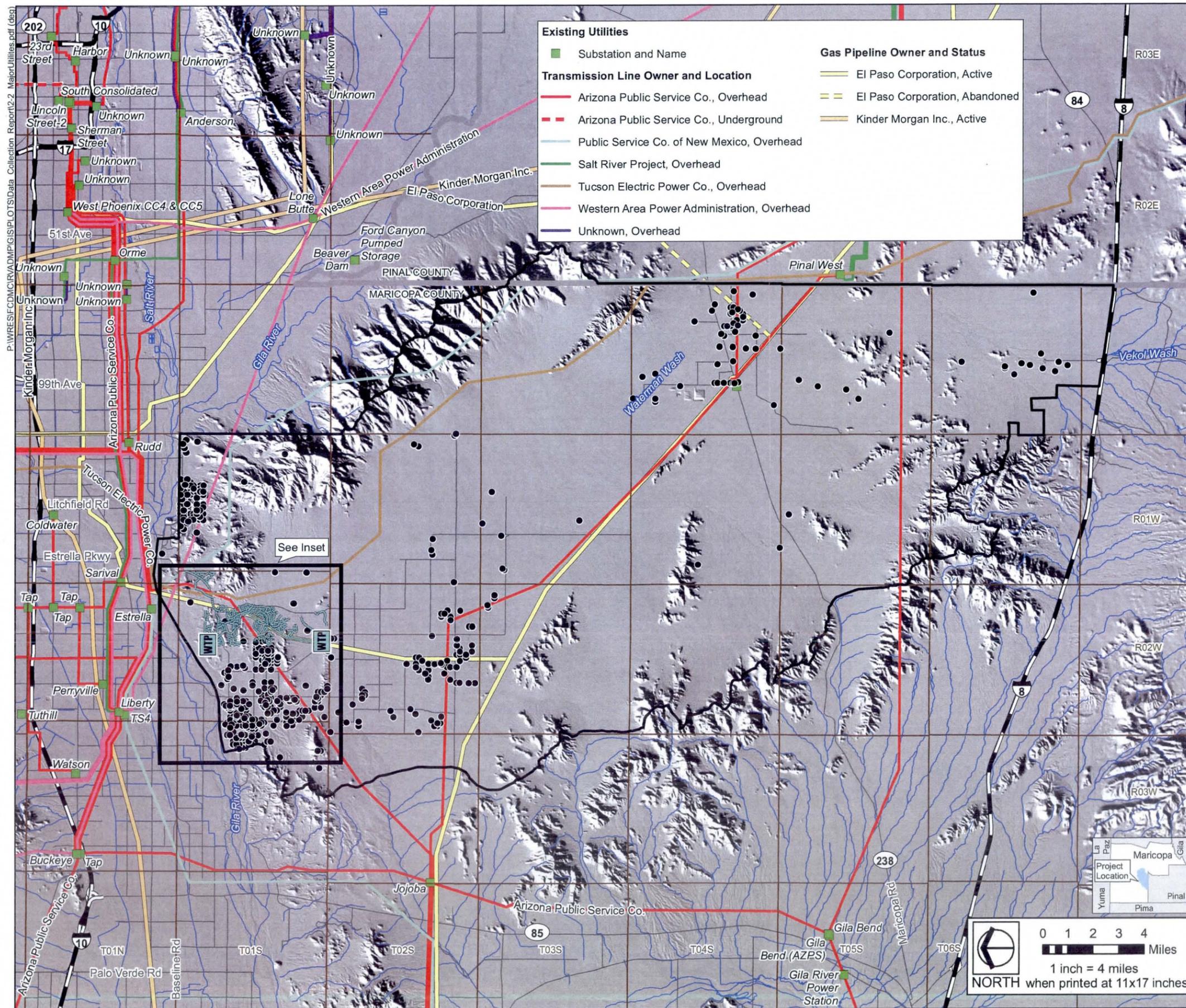


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Rainbow Valley Area Drainage Master Plan Major Utilities



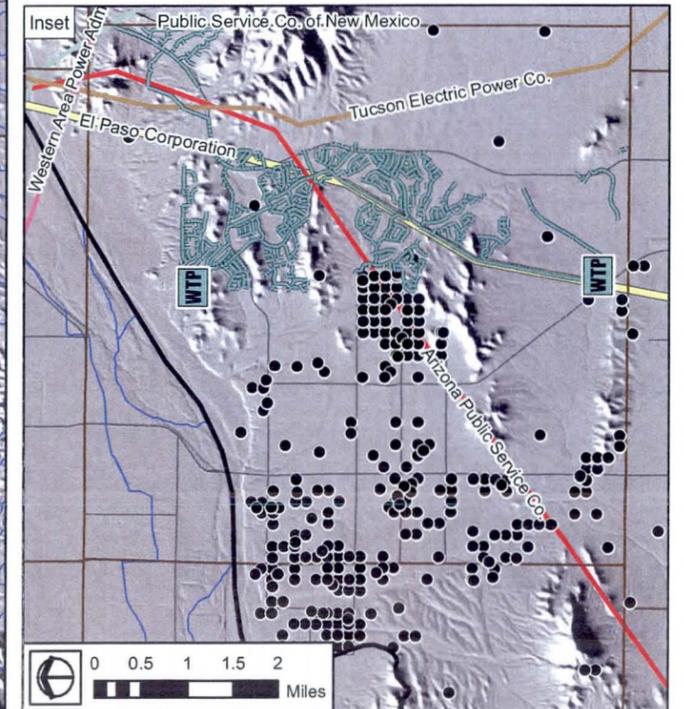
Figure 2-2



Project Features

Existing Water Supply Features in the Study Area

- Public Supply, Domestic, and Industrial Wells
- WTP City of Goodyear Wastewater Treatment Plant
- City of Goodyear Sewer



Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County
 Base Vector and Hillshade Data, 2008
 Platts, A Division of the McGraw-Hill Companies, Inc. - POWERmap (Platts analytical database)
 Transmission Line/Substation 2008
 PennWell MAPSearch
 Gas Pipeline 2006

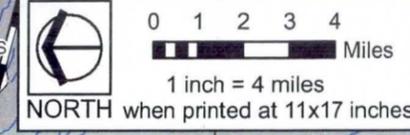


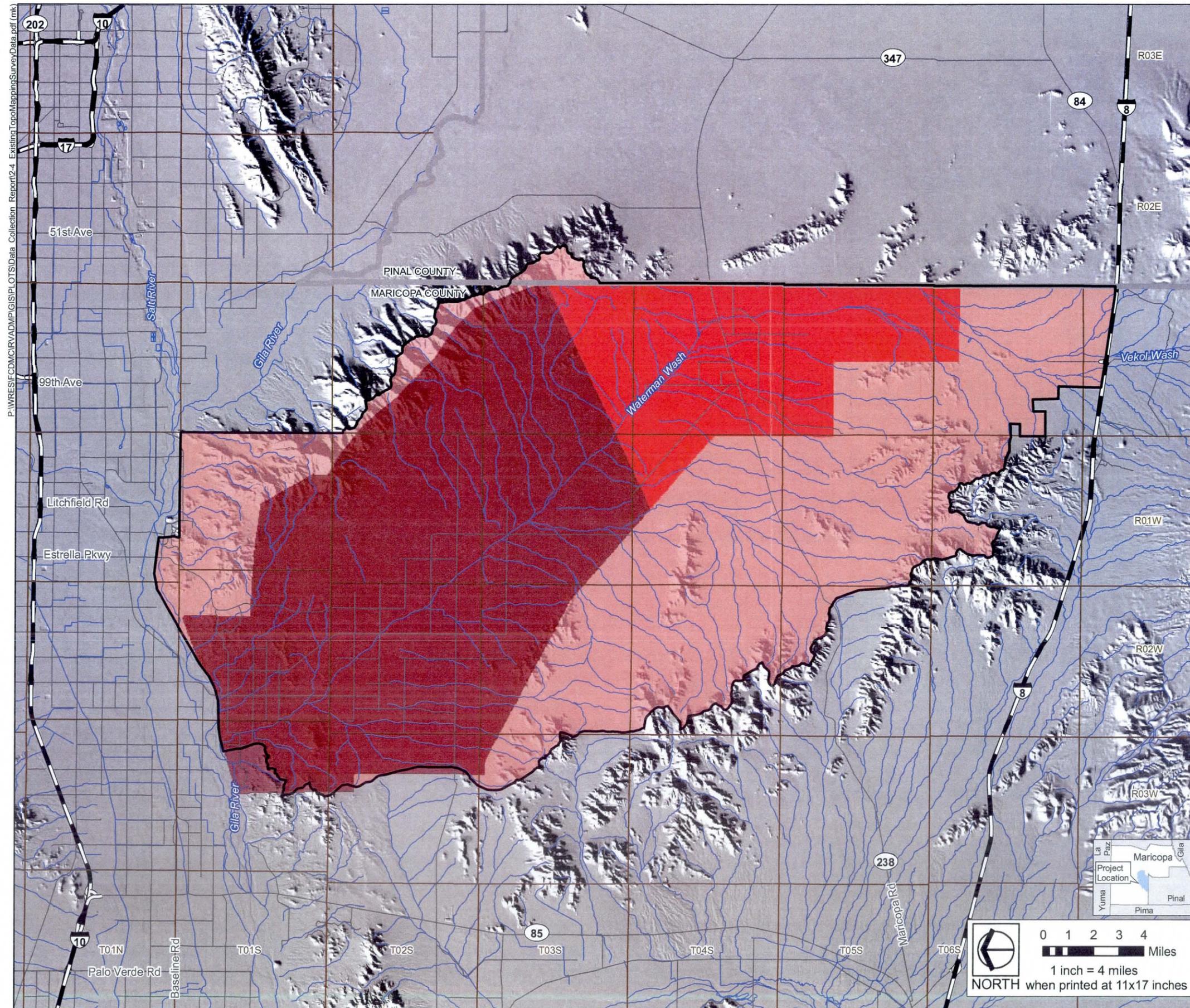
Figure 2-3B
Key to Major Land Holdings Map

- | | |
|---|---|
|  1, Ace PSP LLC |  34, Narrahill LLC |
|  2, Airport and Ocotillo LLC |  35, New River Sod Company of Arizona |
|  3, Antelope Peak Investments LLC |  36, NIX Project II Partnership |
|  4, State of Arizona |  37, NNP III EMR 3 LLC |
|  5, State of Arizona Department of Health Services |  38, NNP III Estrella Mountain Ranch LLC |
|  6, Bhandhusavee Rumbha Trust |  39, Patterson Derby LLC |
|  7, Block Donald B Trust |  40, Phoenix Speedway Corporation |
|  8, Bob Lueck Farms LLC |  41, Polsenberg D F/Adrienne O/DH Financial/Etal |
|  9, Bright Living Trust |  42, Pravorne Gary M TR/Barry O Trust |
|  10, C & S Rainbow LLC |  43, Queen Creek Road Farms 260 LLC |
|  11, Chandler Heights & Cotton Lane LLC |  44, Rainbow 276 Arizona LLC |
|  12, CY Desert Land LLC |  45, Rainbow I LLC/B Bar G Farms Limited Partners |
|  13, Edwards Nadine R Trust |  46, Rainbow Valley Investment Group |
|  14, Engle/Sunbelt LLC |  47, Richard Behrens Buckeye LLC |
|  15, Fahey William D/Jeanne A Trust |  48, RMG - VEF Chandler Heights LLC |
|  16, Flood Control District of Maricopa County |  49, Sahnna Sabeen Kamai/Sandeep Kaur/Sunil Dave |
|  17, Ghaswala D/N TR/Cherry Properties LLC |  50, Schumacher Terry M Trust |
|  18, GMW Enterprises Inc |  51, Sierra Blanca Investments LLC |
|  19, Governor Gila River Indian Community Etal Trust |  52, Sonoran Monument Holdings II LLC |
|  20, HE Capital KR LLC |  53, Sonoran Monument Holdings LLC |
|  21, Homestead Properties II LLC |  54, Sonoran Valley Property LLC |
|  22, Jain Praveen Trust/TOTRR Inc |  55, Sonoran Valley Property LLC/Etal |
|  23, Johnson Otis Trust/Charlie Mae/Beulah/Etal |  56, Stewart Title and Trust of Phoenix Inc Trust |
|  24, Kaben LLC |  57, Sun MP LLC |
|  25, Langley Vekol Valley LLC |  58, Triple Siete LLC |
|  26, Lost Horse Peak LLC |  59, Tuthill and Germann LLC |
|  27, Lufthansa German Airlines |  60, Tuthill and Ocotillo LLC |
|  28, LVL/Buckeye LLC |  61, United States of America |
|  29, Madeira Maricopa LLC |  62, Villages At Estrella Mountain Ranch Community |
|  30, Maricopa County Highway Department |  63, Waste Management of Arizona Inc |
|  31, Maricopa County |  64, Willinger Family Partnership |
|  32, Maricopa County Parks and Recreation |  65, Wrublik Childrens Holding LLC |
|  33, Morandi Randall Trust/Etal | |

Rainbow Valley
Area Drainage Master Plan
Existing Topographic Mapping and Survey Data



Figure 2-4



Project Features

2005 Topographic Data

- 2-foot Contour Interval Digital Topography Extent
- 4-foot Contour Interval Digital Topography Extent

2000 Topographic data

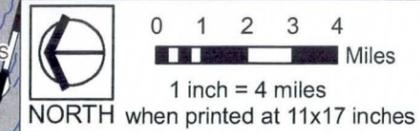
- 10-foot Contour Interval Digital Topography Extent

Reference Features

- County Boundary
- Interstate Highway/
Freeway
- Rainbow Valley
ADMP Boundary
- Major Road
- Township and Range
Boundary
- River/Stream

Data Sources

- Flood Control District of Maricopa County Base Vector and Hillshade Data, 2008
- Flood Control District of Maricopa County 10-foot Contour Interval Digital Topography Extent, 2000
- Flood Control District of Maricopa County 2-foot and 4-foot Contour Interval Digital Topography Extent, 2005



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3.0 FLOOD HAZARD ASSESSMENT

3.1 GEOMORPHIC ASSESSMENT

The Rainbow Valley ADMP study area is a complex geomorphic system composed of multiple landforms exhibiting variable flow characteristics for storm runoff. The geomorphic assessment identifies and describes the flow characteristics associated with the landforms within the study area and is based on evaluation of surficial geologic mapping and soils mapping, interpretation of aerial photographs and topography, and field investigation. The spatial relationship of the landforms and associated flow characteristics in the study area is shown on Figure 3-1.

3.1.1 Mountain Slope Areas

The mountain slope area landform consists of steep mountainous terrain underlain by shallow or exposed bedrock. Mountain slope areas were identified from the aerial photographs, topographic maps and Arizona Geological Survey (AZGS) geologic maps. The mountain slope area landform was observed primarily within the northeastern and southwestern quarters of the study area, with other, smaller mountain areas distributed throughout. The channels in the mountain slope area landform consist of well-defined, low-sinuosity tributary streams in bedrock or mountain canyons.

3.1.2 Piedmont¹ Areas with Tributary Drainage Systems

This landform consists of mildly sloping alluvial surfaces with dendritic tributary drainage networks. Piedmont areas with tributary systems were identified from aerial photographs, bifurcation delineations, topographic maps, Natural Resource Conservation Service (NRCS) soils maps, and AZGS geologic maps. In the study area, the piedmont area with tributary drainage system landform occurs as a buffer between the mountain slope landform and the low-sloping piedmont or alluvial plain. The watercourses in this landform consist of moderately steep, well-defined channels with narrow floodplains.

3.1.3 Piedmont Areas with Distributary² Drainage Systems

The dominant landform in the study area is the piedmont area with distributary drainage system. This landform consists of mild- to low-sloping alluvial surfaces with distributary drainage

¹ The piedmont is a sloping landform located at the base of a mountain and is usually composed of or mantled by unconsolidated alluvium.

² Distributary flow areas have channels that branch and split in the downstream direction.

networks. Piedmont areas with distributary systems were identified from aerial photographs, bifurcation delineation, topographic maps, NRCS soils maps, and AZGS geologic maps.

Both stable and unstable distributary drainage patterns were observed. In general, the western piedmont sloping from the Maricopa Mountains was identified as a stable distributary system created through stream capture rather by the avulsion-dominated processes found in active distributary systems. The distributary portion of the Sierra Estrella piedmont, however, is an active, unstable distributary system.

3.1.4 Alluvial Fans

Alluvial fans are characterized by specific landform characteristics relating to their composition, morphology, and location. Alluvial fans are composed of eroded rock transported and deposited from an upstream watershed. They have the shape of a fan, either partially or fully extended, with a radial pattern of topographic contours. Alluvial fans are located near a topographic break, which may be expressed either laterally or vertically.

Alluvial fan areas were identified from aerial photographs, bifurcation delineations, topographic maps, and AZGS geologic maps. In addition, a reconnaissance-level process of landform identification was used that roughly corresponds to the Level 1 procedure outlined in the District's *Piedmont Flood Hazard Assessment Manual*. In the study area, alluvial fans occur within the piedmont area landform. Potential alluvial fans were identified throughout the study area; however, 25 fans were selected for detailed analysis. Those 25 fans are identified in Figure 3-1 by a red star at the fan apex.

3.1.5 Sheet Flow/Unconfined Flow Areas

Sheet and unconfined flow occurs where there is no well-developed or defined drainage network to convey the majority of floodwater. The term "sheet flow" refers to any form of unconfined runoff that occurs over a broad, expansive area. This broad definition of sheet flow incorporates several more narrowly defined flow types, including natural (classic) sheet flow, urban sheet flow, agricultural sheet flow, overland flow, perched flow, anastomosing flow, and distributary flow. Although sheet flow is the dominant process on high, geologically old swales, these individual landforms were not specifically identified as having sheet flow due to their scale. Large areas of sheet flow were identified within the study area and are shown on Figure 3-1.

3.1.6 Major Riverine Floodplains

A floodplain is a planar surface that is adjacent to a watercourse and is periodically inundated by flood water. Floodplains consist of relatively fine-grained, unconsolidated alluvium recently

deposited by the watercourse. Floodplains were identified from aerial photographs, bifurcation delineations, topographic mapping, AZGS mapping, and maps of existing and pending Federal Emergency Management Agency (FEMA) floodplain delineations. Of the watercourses in the Rainbow Valley ADMP, only Waterman Wash and its major tributaries were large enough to be mapped as a distinct landform at the mapping scale used.

3.1.7 Ponding

Areas of ponding were identified throughout the study area, primarily as stockponds. Although minor ponding likely occurs on the upstream side of roadway, railroad, and other levelike structures, they were not individually identified at the scale of mapping for this study.

3.1.8 Flood Diversion/Detention Structures

Several large flood diversion/detention structures were identified in the southeastern portion of the study area.

3.2 PRELIMINARY ALLUVIAL FAN DELINEATIONS

The study area contains many alluvial fans of varying degrees of potential hazard. Of these, 25 were selected for a detailed evaluation in the Rainbow Valley ADMP study. The eventual goal is to delineate 100-year floodplains that will be regulated by both the District and FEMA. The floodplain delineation process includes identification of alluvial fan landforms (Stage 1), characterizing the active versus inactive flow areas within each fan (Stage 2), and delineating the 100-year floodplain (Stage 3). To date, the Stage 1 and Stage 2 delineations are complete.

3.2.1 Stage 1 Delineation

Data sources for the Stage 1 delineation included topography, NRCS soil surveys, AZGS geologic mapping, aerial photographs (historical and modern), and field observations. These data were used to differentiate piedmont landforms that included mountains, inselbergs³, alluvial fans, alluvial plains, and riverine floodplains. The locations of the hydrographic apices on the alluvial fans were also identified in Stage 1. The hydrographic apex is the location at which flow of water and sediment becomes unconfined and spreads out rapidly. Sudden expansion of flow at the hydrographic apex causes sediment deposition, uncertain flood flow paths, and uncertain flow distribution below the apex. The complex hydraulics associated with this flow expansion and sediment deposition creates significant uncertainties that “cannot be set aside in the realistic assessment of the flood hazard” (FEMA 2002), which is the defining characteristic for alluvial

³ An inselberg is “an isolated residual knob or hill, rising abruptly from a lowland erosion surface” (Bates and Jackson 1984).

fan flooding. The results of the draft Rainbow Valley ADMP Stage 1 analysis are shown in Figure 3-2.

3.2.2 Stage 2 Delineation

Stage 2 delineation consists of defining active and inactive portions of the alluvial fan landform. Active areas are locations where uncertainties about channel geometry and hydraulic conditions of water and sediment discharge cannot be set aside in a realistic assessment of flood hazard. Active areas on alluvial fans experience sediment deposition, erosion, and unstable flow paths in addition to flood inundation. Generally, active alluvial fans have experienced these processes within the past 10,000 years (the Holocene epoch). Inactive alluvial fan areas are the portions of the alluvial fan where active fan processes do not occur. Generally, inactive alluvial fans have not experienced such processes within the past 10,000 years, but may have done so during much older geologic periods (e.g., the Pleistocene epoch or Tertiary period). Stage 2 delineation also identifies portions of the piedmont subject to various types of flooding such as stable riverine flooding, active alluvial fan flooding, inactive alluvial fan flooding, and sheet flooding. The result of the draft Rainbow Valley ADMP Stage 2 analysis is shown in Figure 3-3.

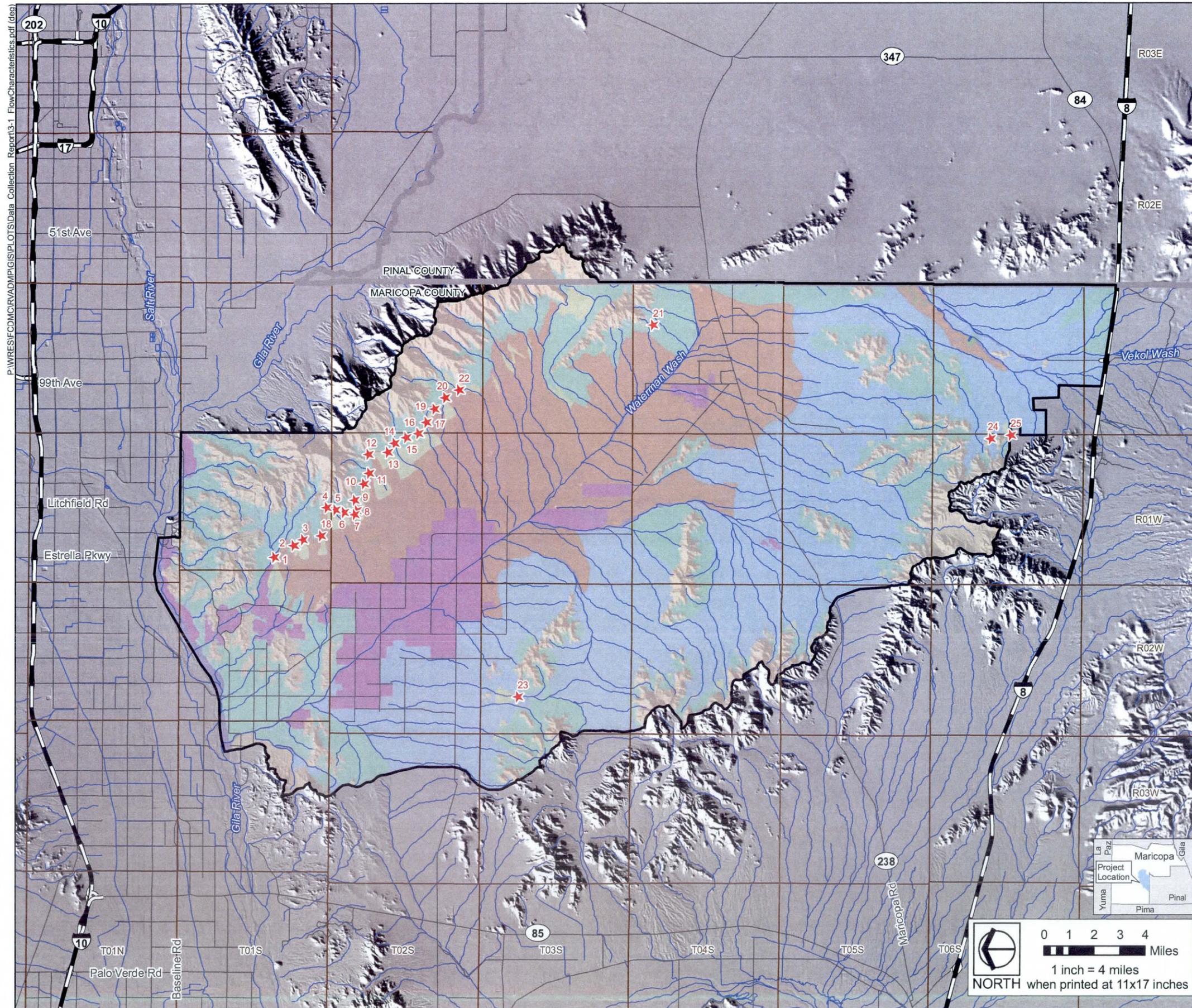
3.2.3 Stage 3 Delineation

The Stage 3 delineation will be based on methodologies from the *Piedmont Flood Hazard Assessment for Flood Plain Management for Maricopa County, Arizona* (Hjalmarson 2003), which is currently being revised by the District. The Rainbow Valley ADMP Stage 3 analysis will proceed once those revisions are complete.

Rainbow Valley Area Drainage Master Plan Flow Characteristics



Figure 3-1



Project Features

- ★ Alluvial Fans Selected for Floodplain Delineation

Flow Characteristics

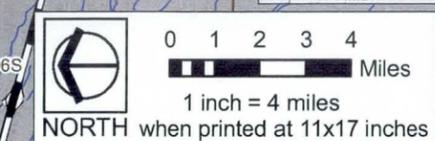
- Alluvial Fan Flooding
- Disturbed Area
- Flood Retarding Structure
- Major River and Tributary Flooding
- Mountains
- Piedmont Distributary Flooding
- Piedmont Tributary Flooding
- Sheet Flooding
- Stockpond

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

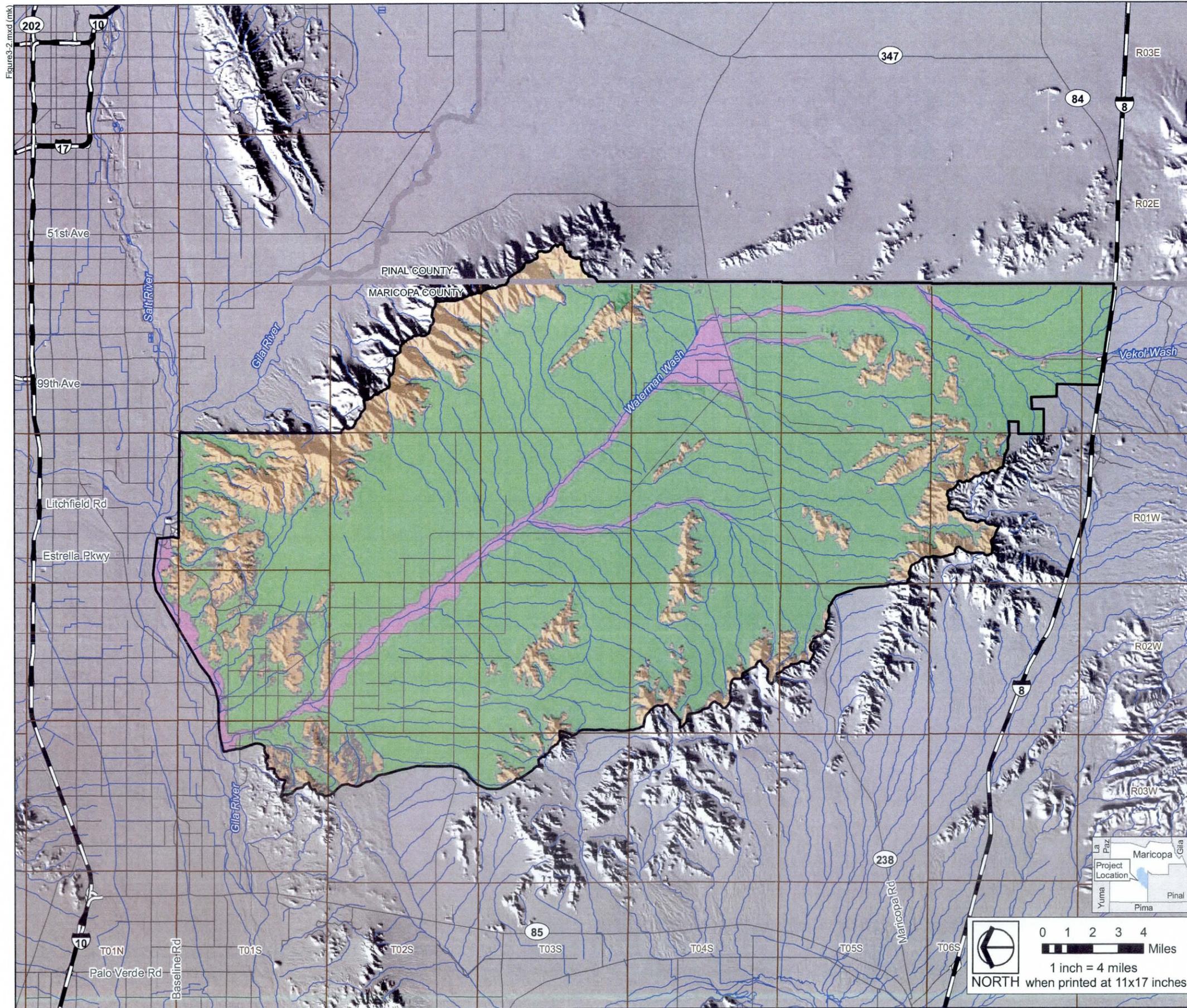
Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
JE Fuller/Hydrology & Geomorphology
Alluvial fan identification and flow characteristics assessment, 2008



Rainbow Valley
Area Drainage Master Plan
Preliminary Stage 1 Delineation



Figure 3-2



Project Features

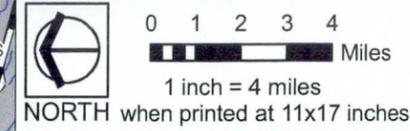
- Alluvial Fan
- Bedrock
- Floodplain

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

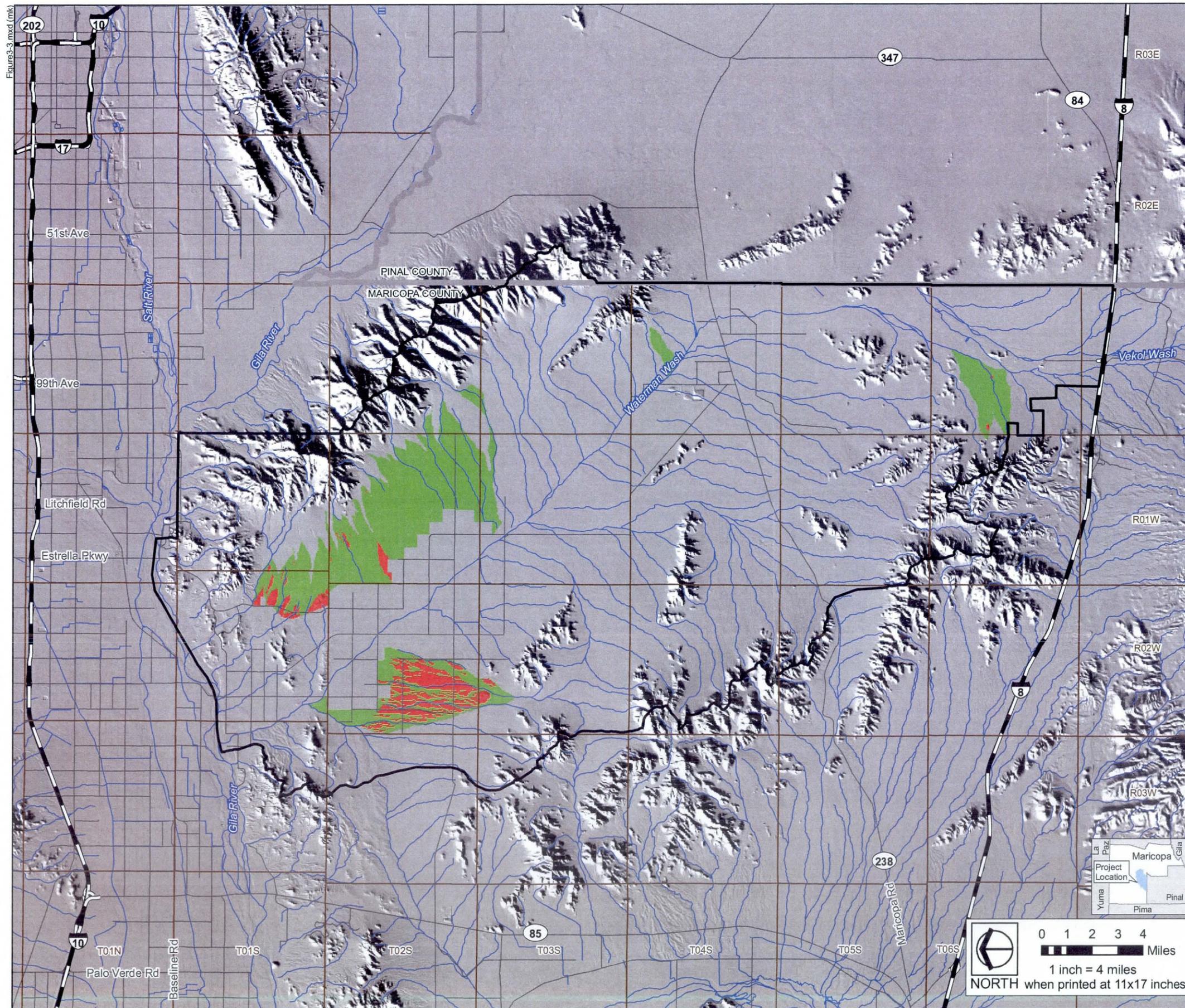
Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
JE Fuller/Hydrology & Geomorphology
Stage 1 Delineation, 2008



Rainbow Valley
Area Drainage Master Plan
Preliminary Stage 2 Delineation



Figure 3-3



Project Features

- Active Alluvial Fan
- Inactive Alluvial Fan

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
JE Fuller/Hydrology & Geomorphology
Stage 2 Delineation, 2008

Figure 3-3.mxd (mk)

4.0 HYDROLOGY

4.1 INTRODUCTION

To allow the data collection to be completed in advance of the hydrology revisions being completed as part of this project, the most recent hydrology for the study area, developed by Engineering and Environmental Consultants, Inc. (EEC) (EEC 2006), is the basis for the information provided in this section. As part of this project, a review of the existing conditions hydrologic analysis was conducted to identify any discrepancies or issues which were then documented in an initial hydrology memorandum and submitted to the District in October 2008 (URS 2008a). The identified concerns or issues will then be resolved during the course of the update to the existing conditions. The revised hydrology will be used for all subsequent phases of this project. The results of the EEC hydrology study are shown on Figure 4-1, which depicts the magnitude of flows using color-coded flow lines.

A separate hydrology report is being prepared that will discuss the methodology and updated hydrology to be used in the development of alternatives and delineating of floodplains.

4.2 EXISTING CONDITIONS HYDROLOGY

4.2.1 Hydrology Model

EEC prepared the most recent hydrology study for the study area. The U.S. Army Corps of Engineer's HEC-1 computer model was used to evaluate hydrology at various concentration points throughout the watershed. HEC-1 input data were generated from 10-foot contour mapping, aerial photographs, the ArcView GIS program, and the District's Drainage Design Management System for Windows (DDMSW), version 2.1. The 100-year, 24-hour storm was the event used to model the watershed.

4.2.2 Watershed Boundary

Major drainage basin boundaries were selected based on hydrologic isolation from the rest of the watershed. Sub-basins were located within the major drainage basins at concentration points of interest, at confluences of two or more sub-basins, or at locations of split flow. The watershed was broken into 10 major drainage basins (labeled A through J, as shown on Figure 4-1).

4.2.3 Soils and Land Use

Three different soil surveys from the NRCS were used for the study. Two of the soil surveys were for Maricopa County, and the third was for Pinal County. Land use data were obtained from the District's dataset, and changes were made based on the latest aerial imagery. The many

split flows identified within the study area were modeled in FlowMaster using normal depth calculations.

4.2.4 Rainfall

The National Oceanic Atmospheric Administration Atlas II, *Precipitation-Frequency Atlas of the Western United States, Volume VIII, Arizona*, was the source of the isopleth maps used to determine the 100-year 24-hour rainfall (Miller et al. 1973). The point precipitation value was found to be 4.40 inches. A United States Geological Survey (USGS) stream gage (No. 09514200) is located on Waterman Wash approximately 3.5 miles upstream of its confluence with the Gila River near the intersection of Ray Road and Airport Road. A stream gage (No. 6833) that began operation in 1999 is located at Rainbow Valley Road and Waterman Wash, but that gage has recorded only relatively minor flows since its installation.

4.2.5 Rainfall Losses

Rainfall infiltration losses were calculated using the District's DDMSW software, and the rainfall loss method used was the Green and Ampt infiltration model. The District's draft *Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology*, provided information about land use and surface retention loss (District 2009). These values, for the initial abstraction, were applied to the sub-basins in the DDMSW program. The data on percent of impervious area were based on the land use and the representative values described in the District's *Drainage Design Manual, Volume I*. Those data are included in the default parameters of the District's DDMSW program.

4.2.6 Unit Hydrograph

The S-graph method was selected as the unit hydrograph to model Waterman Wash since the wash is considered a major watercourse. Each of the sub-watersheds include multiple sub-basins that vary in size from a fraction of a square mile to more than 15 square miles. Most of the watershed consists of undeveloped desert with some farmland around the lower reaches of Waterman Wash.

4.3 VEKOL WASH DIVERSION

Vekol Wash originates in the Sand Tank Mountains south of the Waterman Wash watershed. Vekol Wash runs parallel to Waterman Wash where both watercourses flow in a northeasterly direction. The aerial imagery and USGS topographic mapping shows a possibility for split flows in this area. A field reconnaissance conducted to evaluate the potential for split flows found none along the watershed divide between Waterman Wash and the Vekol Wash tributary. Any flow

that could potentially break and run into Waterman Wash would be a sheet flow and would be difficult to quantify, and coincident peak flows in the Vekol Wash tributary and Waterman Wash are unlikely. Therefore, the recommended diversion of flow from the Vekol Wash watershed into Waterman Wash is estimated as zero. The details of the field reconnaissance, methodology, and calculations were prepared and submitted to the District in October 2008 (URS 2008b).

4.4 IMPACT OF UNION PACIFIC RAILROAD

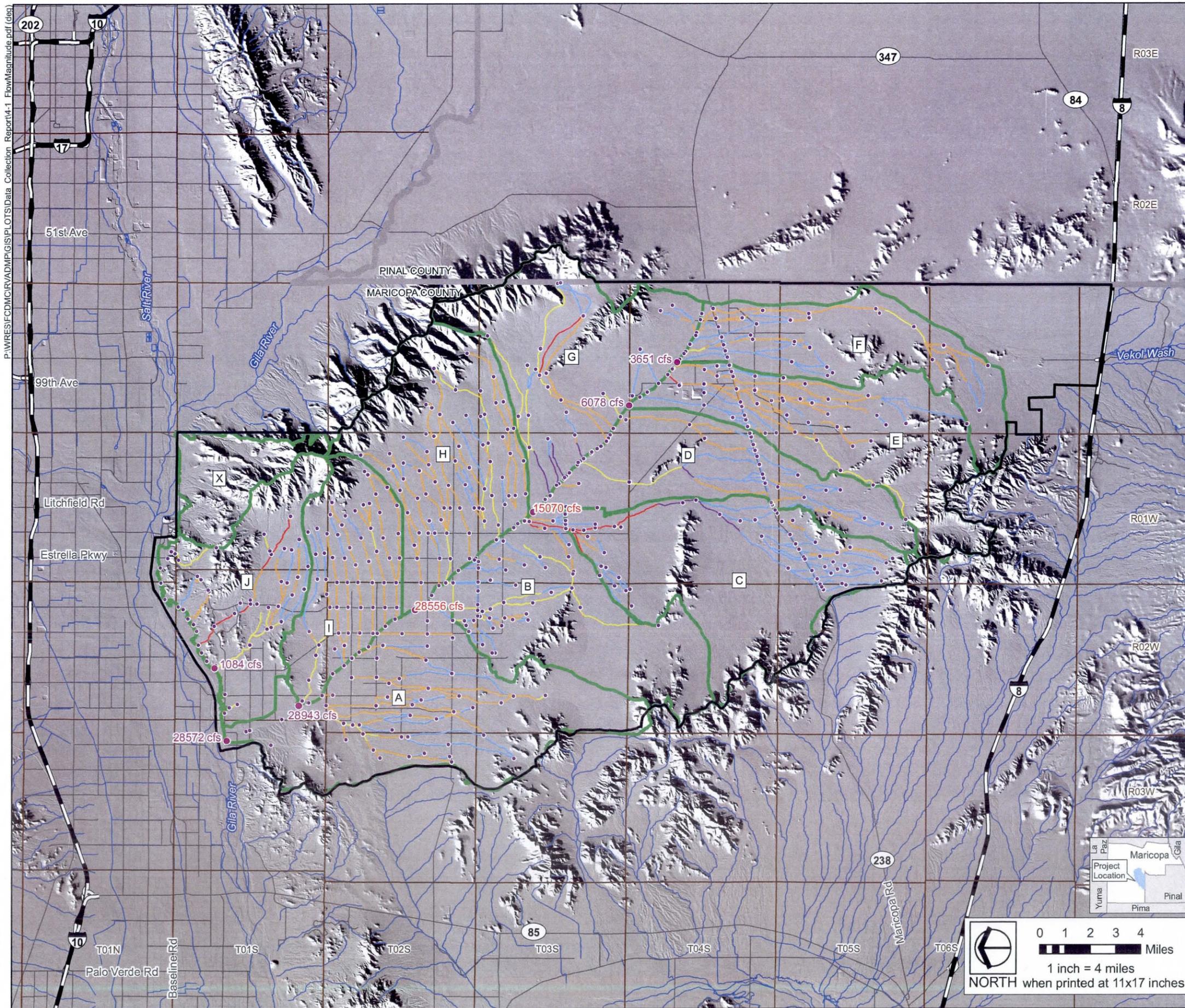
The UPRR track bisects the study area and is south of and parallel to State Route 238. The railroad embankment is above grade and is considered by FEMA to be an “uncertified levee.” The embankment impounds and diverts runoff to the various drainage structures along the railroad alignment. The existing hydrologic analysis evaluated a “with” and “without” railroad analysis to meet FEMA’s guidelines for levee-like structures. The “with” railroad scenario accounts for the routing of flows through railroad structures and flow diversions along the railroad embankment. Diverted flow would either be routed to another structure or to storage areas located at low points upstream of the railroad embankment. For the “without” railroad scenario, the railroad embankment was removed from the models and the flows were allowed to follow their historic flow paths. Evaluating both scenarios was necessary to meet FEMA’s guidelines for determining flood hazards that can be associated with a levee failure and to determine the impact that the railroad has on the 100-year storm event.

The UPRR is currently adding a track south of the existing track that will also be above grade at approximately the same elevations as the existing track. The new track will have drainage structures at the same locations as the existing track, but the structures for the existing track will be replaced with new structures. The new track will be accounted for in an updated hydrologic analysis.

Rainbow Valley
Area Drainage Master Plan
Flow Magnitude and Extent



Figure 4-1



Project Features

- Drainage Concentration Point
- Major Drainage Concentration Point with Flow Rate

Drainage Flow Path with Flow Rate

- < 500 cfs
- 501 - 2,000 cfs
- 2,001 - 5,000 cfs
- 5,001 - 10,000 cfs
- > 10,000 cfs
- ▭ Major Drainage Basin Boundary
- ▭ Major Drainage Basin Name

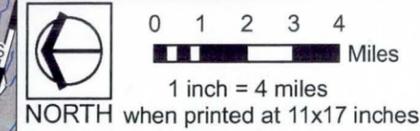
Note:
Flow rates are based on a 100-year 24-hour event.
All flow rates are in cubic feet per second (cfs).

Reference Features

- ▬ County Boundary
- ▬ Rainbow Valley ADMP Boundary
- ▬ Township and Range Boundary
- ▬ Interstate Highway/Freeway
- ▬ Major Road
- ▬ River/Stream

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008



P:\WRES\FCDM\RV\ADM\PC\GIS\PLOTS\Data_Collection_Report\4-1_FlowMagnitude.pdf (deg)

5.0 ENVIRONMENTAL EVALUATION

5.1 INTRODUCTION

This section summarizes the cultural and ecological resources within the study area. Due to the limited land development within the study area to date, the cultural and ecological resources are relatively undisturbed in most cases. This creates a unique opportunity for planning in a manner that will protect or enhance these valuable resources.

5.2 CULTURAL RESOURCE ASSESSMENT

5.2.1 Introduction

A cultural resource assessment was prepared as a separate report to (1) define the cultural context of the study area, (2) model cultural resource sensitivity, (3) identify cultural resource constraints and opportunities for enhancing preservation and interpretation of archaeological and historical resources in the study area, and (4) assess compatibility with different flood protection methods, structures, and landscape design themes. The cultural resources assessment also addressed the objectives of the *Maricopa County Comprehensive Plan: Eye to the Future 2020* for promoting appreciation and preservation of significant archaeological and historical resources within the framework of state and federal laws (Maricopa County 2002).

5.2.2 Methodology

The District sponsored a cultural resource overview of the study area during an earlier stage of planning (Rodgers 2008). (The overview encompassed about 335 square miles of the Rainbow Valley ADMP study area, excluding parts of the Rainbow Valley drainage within the Sonoran Desert National Monument and the western edge of the Gila River Indian Community.) The District digitized the locations of prior cultural resource surveys and recorded archaeological and historical sites that were mapped by the prior overview and provided GIS shape files for use in the cultural resource assessment. A one-day orientation reconnaissance of the study area was conducted on May 7, 2008, but no additional data collection or survey was conducted.

5.2.3 Results

Summary of Prior Cultural Resource Studies

Human societies have occupied Arizona for at least 12,000 years, but Rainbow Valley seems never to have been a focus of settlement during the prehistoric or historic eras, probably because of the lack of water. Only two prehistoric habitation sites have been recorded in the assessment area, a large Hohokam village at the confluence of the Gila River and Waterman Wash, and

another small settlement in a pass in the Sierra Estrella. Archaeological sites indicate that prehistoric populations did exploit the resources of the study area, but they probably resided in nearby locales with more abundant water supplies (such as the Gila River) and entered the Rainbow Valley on only a limited, seasonal basis.

During much of the historic period, Rainbow Valley appears to have been primarily an area to travel across rather than to stay. At the end of the seventeenth century and during the eighteenth century, Spanish priests and colonizers followed the Gila Trail across the southern end of the valley, undoubtedly using a prehistoric trail along a cutoff to avoid the longer route along the bend of the Gila River as it swings north on the eastern side of the Sierra Estrella, and then back south before turning west to join the Colorado River. The 40-mile-long cutoff did not have any water sources, but in the late 1850s, the Butterfield Overland Mail Road was developed in this trail corridor, and the Southern Pacific Railroad was built along a similar route across the southern end of the Rainbow Valley in 1879. The General Land Office did not conduct a cadastral survey of most of Rainbow Valley until 1918, and homesteading and settlement does not appear to have been initiated until the 1920s. The small community of Rainbow Valley did not warrant a post office until 1930, and a road probably was not developed through the entire Rainbow Valley until the 1920s or 1930s.

Lack of water supplies thwarted agricultural development. Deep irrigation well technology was adopted in the northern part of Rainbow Valley after World War II, but it proved to be largely an unsustainable strategy because much of that land went out of production within half a century. The African-Americans who homesteaded in Mobile Valley never were able to afford deep irrigation wells, and the African-American community has largely disappeared. The history of the region as a desultorily used secondary resource zone or sparsely occupied rural area has changed only recently as a result of the growing Phoenix metropolitan area expanding into Rainbow Valley. The need to protect the investments of the expanding development from flooding has stimulated development of the Rainbow Valley ADMP. The previously prepared cultural resource overview provides more information about the cultural history of the area, and compiles information about 112 cultural resource investigations conducted within the study area (Rodgers 2008). Fifty-eight of those investigations were intensive cultural resource surveys that, in the aggregate, covered about 30 square miles or 9 percent of the cultural resource assessment area (Table 5-1).

Table 5-1 Summary of Prior Cultural Resource Studies

Type of Study		Number	Description
1	Reconnaissance Survey	30	Twenty-three of these are General Land Office cadastral surveys; others include three reconnaissance, three intensive, and one formal sample survey.
2	Aerial Mapping	13	These are aerials photographs taken to produce U.S. Geological Survey 7.5-minute topographic quadrangles.
3	Independent Research	5	Two are place name books and three are studies of Mobile, historic trails, and transcontinental railroads that were funded by the State Historic Preservation Office.
4a	Intensive Field Survey— Linear	34	Covered 1,543 acres in the aggregate.
4b	Intensive Field Survey— Block	24	Covered 18,058 acres in the aggregate.
5	Site Inspection	1	This study compiled an inventory of archaeological sites recorded in Maricopa County and field checked some sites to determine their condition.
6	Monitoring	1	Involved hazardous material removal; no sites were identified.
7	Site Test Excavations	3	One project was conducted in the Estrella Mountain Ranch residential development, one at the Mobile section house/Lung homestead, and one at a geotechnical test location.
8	Site Data Recovery Studies	1	The study investigated 28 sites in Estrella Mountain Ranch residential development.
Total		112	

SOURCE: Rodgers 2008

Most of the prior surveys were concentrated in the northern part of the study area and were stimulated primarily by residential development or management of public land administered by the BLM. Only limited survey has been conducted in the southern three-fourths of the study area. Except for a few block surveys conducted around Mobile in conjunction with development of the solid waste landfills, most of the surveys in the southern part of the study area covered a few narrow linear corridors for facilities such as transmission lines, power lines, pipelines, roads, and fence lines.

Summary of Recorded Archaeological and Historical Resources

The cultural resource overview compiled information about 135 archaeological and historical sites recorded in the study area. The inventory includes 77 prehistoric sites, 56 historical sites, and 2 sites with both prehistoric and historical components. The 137 components were classified into 15 themes (Table 5-2). More information about those resources is provided in the separate cultural resource assessment report.

Table 5-2 Summary of Recorded Prehistoric and Historic Components

Theme	Number	Description
<i>Prehistoric</i>		
Residential Living	2	Large Hohokam village at confluence of Gila River and Waterman Wash, and a site with three to four rock-outlined rooms in a pass through the Sierra Estrella.
Rock Art Production	15	Mostly small sites; one site at Butterfly Tanks has an impressive panel.
Resource Exploitation	62	Mostly artifact scatters, some with simple features.
Subtotal	79	
<i>Historical</i>		
Community Growth and Development	15	All components are associated with Mobile, including homesteads, houses, post office, church, cemetery, and Negro Flat Tank (North Tank) formerly used by the now defunct Galilee Baptist Church for baptisms.
Roadway Transportation	13	Four have been recorded, including the Butterfield Overland Mail Road (same as Gila Trail), State Route 84, one unnamed road in the Estrella Mountain Ranch residential development, Riggs Road bridge. Nine components identified on General Land Office plats have not been recorded.
Cattle Ranching	8	Five have been recorded, including wells, corrals, feeding stations, and camps; three components identified on General Land Office plats have not been recorded.
Trash Deposition	7	Secondary trash dumps, mostly dating between the 1920s and 1940s.
Squatting	4	Two sites destroyed by Estrella Mountain Ranch residential development; two identified on General Land Office plat have not been recorded.
Agriculture	3	One farmstead was destroyed by Estrella Mountain Ranch residential development. Two others were identified on General Land Office plat but have not been recorded: One is a ditch, and the other a corral, ditch, and H. Waterman House (perhaps the farmstead of Colonel Waterman—the namesake of Waterman Wash).
Mining	2	A 1940s to 1950s prospecting camp, and “mines” identified on U.S. Geological Survey topographic map but not recorded.
Homesteading	2	Both 1930s sites were destroyed by the Estrella Mountain Ranch residential development (several other homesteads in Mobile area have not been recorded).
Cadastral Surveying	1	Initial Point of the Gila and Salt River Baseline and Meridian.
Interstate Exploration and Travel	1	Gila Trail (Juan Bautista de Anza National Historic Trail).
Railroad Transportation	1	Southern Pacific Railroad, built through the area in 1879, continues to be operated as Union Pacific Railroad.
Spiritual Questing	1	Quartz Peak Trail (has traditional significance for Akimel O’odham).
Subtotal	58	
Total	137	

SOURCE: Rodgers 2008

Significance

Significant cultural resources may offer opportunities or represent constraints for implementing flood protection plans. Cultural resources have various types of significance. Criteria for listing in the Arizona Register of Historic Places (Arizona Register) and National Register of Historic Places (National Register) are commonly used to assess the significance of cultural resources because register-eligible sites are, by definition, worthy of preservation. To be eligible for the

Arizona Register and National Register, properties must be at least 50 years old (unless they have special significance) and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They also must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of four criteria:

- Criterion A: Be associated with significant historical events or trends.
- Criterion B: Be associated with historically significant people.
- Criterion C: Have distinctive characteristics of a style or type, or have artistic value.
- Criterion D: Have yielded or have potential to yield important information (Arizona Administrative Code, Title 12, Chapter 8, Article 3, R12-8-302; Title 36, Code of Federal Regulations, Part 60).

Only one site in the assessment area—the Initial Point of the Gila and Salt River Baseline and Meridian—is listed in the National Register. The Keeper of the National Register, which is maintained by the National Park Service, has the authority to list properties in the National Register. Determinations of National Register eligibility commonly are made for the purposes of assessing project impacts as consensus determinations between the responsible agency and the State Historic Preservation Officer. The Arizona State Historic Preservation Officer has the authority to determine eligibility and list properties in the Arizona Register in consultation with the Historic Site Review Committee. The significance of most of the archaeological and historical sites recorded in the study area has not been formally evaluated.

Historical districts, buildings, structures, and objects that are eligible for listing in the historic registers are usually found to have significance under Criteria A, B, and/or C, and protection of those values requires preservation in place. Such resources commonly have some potential for public interpretation. In contrast, register-eligible archaeological sites usually are deemed to be significant because they have potential to yield important information (Criterion D). Because archaeological sites are nonrenewable resources, there are reasons to conserve them, but they are so abundant that preserving all sites in place is impractical. Recovery and preservation of the information and artifacts contained in archaeological sites commonly is considered an adequate strategy in lieu of preserving the sites in place. At least 28 of the sites recorded in the study area have been destroyed, and most were studied to recover and preserve information as mitigation for subsequent residential development. Archaeological sites with partially intact ruins or features such as petroglyphs have some potential for public interpretation, but relatively few

archaeological sites have sufficiently intact structures or visible features that the public can appreciate.

Assessing the Sample Data

The 137 archeological and historical components identified by the cultural resource overview represent a substantial inventory, although 20 of those sites have been identified only on historical maps and it is not known if any physical evidence remains intact at those locations. Because only about 9 percent of the study area has been inventoried for cultural resources, many sites have yet to be discovered. A simple projection based on the available sample indicates that there might be on the order of 1,000 to 1,500 unrecorded archaeological and historical sites within the study area, more than 90 percent of which have yet to be discovered and recorded. Such a projection is subject to a considerable margin of error because not all recorded sites were associated with documented surveys, not all surveys were of comparable intensity, and the results of prior surveys might not be representative because they were so highly clustered in the northern part of the study area.

Spatial Distribution of Cultural Resources and Model of Sensitivity Zones

Because so much of the study area has not been inventoried for cultural resources, the available data were used to develop a model of cultural resource sensitivity zones. The model was based on the densities and types of archaeological and historical sites recorded in different environmental zones. The spatial distribution of human activities, and the resulting distribution of archaeological and historical sites, is not random across any landscape but clusters in response to a variety of environmental and social factors. Environmental factors do not determine the course of human history but do provide critical opportunities and can impose constraints. To assess correlations of the frequency and types of sites within different environments, the study area was divided into the following four environmental zones:

1. Mountains
2. Foothills and Upper Bajadas
3. Lower Bajadas and Valley Plains
4. Named River and Wash Corridors (0.6 mile wide along the Gila River, Waterman Wash, Lum Wash, Corgett Wash, and Vekol Wash)

The extent of cultural resource survey within each zone was calculated, and the numbers of recorded sites in each zone were counted. The extent of survey coverage in the mountains zones (9 percent) is about proportional to the extent of that zone within the study area (11 percent). A

relatively high percentage of the prior survey was conducted in the foothills and upper bajadas zone (40 percent) and river and wash corridors zone (27 percent) as compared to their areas (15 and 14 percent of the study area, respectively). The percentage of survey in the lower bajadas and valley plains (25 percent) is low compared to the extent of that zone (60 percent) within the study area, and therefore might be less representative. The analysis indicated that the average site density varied relatively little among the zones, ranging between about 2.8 to 4.5 sites per square mile (Table 5-3).

Table 5-3 Distribution of Cultural Resources by Environmental Zones

Environmental Zone	Area (square miles)	Percentage of Area (%)	Area Surveyed (square miles)	Percentage of Survey (%)	Number of Sites	Percentage of Sites (%)	Sites/Square Mile ¹
Mountains	36	11	2.6	9	10	9	3.8
Foothills and Upper Bajadas	50	15	11.9	40	53	46	4.5
Lower Bajadas and Valley Plains	201	60	7.4	25	30	26	4.1
Named River and Wash Corridors	48	14	8.0	27	22	19	2.8
Totals	335	100	29.9	100	115	100	3.8

¹ Site density was calculated by dividing the number of recorded sites by the number of square miles surveyed. Because not all sites are associated with documented surveys and all surveys may not be mapped or mapped very accurately, the densities have an unknown margin of error.

Table 5-4 summarizes information about the types of sites found in the different environmental zones with corresponding levels of cultural resource sensitivity. The mountains, lower bajadas and valley plains, and named river and wash corridors zones are rated as having low cultural resource sensitivity. The foothills and upper bajadas zone is rated as having moderate sensitivity because it has the highest recorded site density and many of the recorded sites are petroglyphs, which could have some potential for public interpretation in conjunction with development of flood protection facilities. Because the inventory of cultural resources is so limited, the analysis of constraints and opportunities focused on five cultural resources selected as having high sensitivity and potential for public interpretation in conjunction with development of flood protection facilities. These include the Quartz Peak Trail, Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road, Hohokam village site/possible Waterman farmstead site, the Mobile African-American community, and the Initial Point of the Gila and Salt River Baseline and Meridian.

Table 5-4 Types of Archaeological and Historical Resources by Environmental Zone

Cultural Resource Character Types	Mountains	Foothills/ Upper Bajadas	Lower Bajadas/ Valley Plains	Named River and Wash Corridors	Totals	Comments
<i>Site Types</i>						
Prehistoric Habitation Sites		1			1	Some potential for public interpretation; potential for sensitive human burials.
Prehistoric Petroglyph Sites	1	13		1	15	Some potential for public interpretation.
Prehistoric Resource Exploitation (Limited Activity) Sites	8	34	4	15	61	Important for information potential; little potential for public interpretation.
Historic Settlement		4	8	5	17	Little potential for public interpretation.
Historic Transportation			3		4	Little potential for public interpretation.
Mining				1	1	
Sensitivity Rating	low	moderate	low	low		
<i>Selected High-Sensitivity Resources with Potential Opportunities for Public Interpretation</i>						
Quartz Peak Trail AZ T:16:124(ASM) (Prehistoric and Historic)	1				1	A traditional cultural resource located in a wilderness area.
Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road AZ T:15:32(ASM)			1		1	Potential to coordinate interpretation with the Sonoran Desert National Monument.
Hohokam village site [AZ T:10:43(ASM)]/ possible Waterman Farmstead Site				1	1	May not retain much integrity, but has potential for sensitive human burials; evidence of Waterman farmstead may or may not remain intact.
Mobile (Historic African-American Community)			13		13	Cemetery and baptismal pond are highly sensitive, but most other resources have little historical integrity.
Initial Point, Gila and Salt River Baseline and Meridian AZ T:11:102(ASM)		1				Basis for the General Land Office cadastral survey of most of Arizona that provided a framework for filing homestead and mining claims.
Totals	10	54	29	23	116	
Site Density/Square Mile	3.8	4.5	4.1	2.8	3.8	

5.3 ECOLOGICAL ASSESSMENT

5.3.1 Introduction

The purpose of the ecological assessment was to characterize general ecological resources, specify the areas with significant ecological value, identify areas with rare or protected species, and describe distinctive features such as wildlife corridors or other sensitive habitats. This

analysis provides baseline biological data for flood protection compatibility analysis and future alternatives determination to accommodate both the existing and likely future development within the study area.

5.3.2 Methodology

Data collection and assessment used a rapid ecological assessment methodology first developed by the Nature Conservancy and applied to a range of other applications (Ruediger and Lloyd 2003). Inventory of the biological resources involved documenting the distribution of vegetation types, special status species, specialty resources, and wildlife species in the study area. Data were obtained from secondary publications, agency sources, and field observations.

Three reconnaissance or “windshield” surveys were conducted during the spring and late summer of 2008 to document and confirm the biological resources in the study area. These concentrated on the western flank of the Sierra Estrella, Vekol Valley, Waterman Wash, and the eastern flanks of the Maricopa Mountains. Notes to record the types and location of biological resources were taken throughout the course of these surveys.

Prior to field surveys, initial data relating to the distribution of special status species and species of concern likely associated with the study area were collected from agency lists and verified through further coordination with those agencies. Federal, state, and agency listed species and designated critical habitat potentially occurring in the study area were obtained from the U.S. Fish and Wildlife Service and Arizona Game and Fish Department (AGFD). A list of any special status species, species of concern, and critical habitat documented in the study area or within 3 miles of its boundary was obtained from AGFD’s Project Evaluation Program. Through further correspondence and joint meetings, AGFD provided additional project-specific guidance and data concerning important resources and wildlife corridors.

Distribution data for other wildlife and plants were obtained from a variety of secondary publications. Data for most plants were assessed from vegetation association data available from the USGS National GAP Analysis Program and additional aerial imagery. Wildlife data were obtained from distribution-centered publications of the birds, mammals, reptiles, and amphibians likely associated with the study area.

Data about the location of wildlife corridors also were obtained. The District initially provided corridors modeled by Beier et al. (2008) that were inadequate for planning purposes. The District asked AGFD to provide alternative data that corresponded to the future location of undeveloped land and potentially less desirable habitats for corridors or movement areas, which were adopted for this study.

5.3.3 Results

Special Status Species and Species of Concern

Analysis indicated that suitable habitat exists for 30 special status species and species of concern within the study area. The study area should provide adequate habitat, food, and shelter to support individuals or local populations of those species. The details of the legal protection, habitat requirements, habitat suitability, and distributions of these species are described in Table 5-5, and the broad habitats associated with these species are shown in Figure 5-2.

From this initial list of 30 species, AGFD identified 12 special status species or species of concern that have been documented in the study area or within 3 miles of its boundary. This list of 12 species includes two federally endangered species, the Yuma clapper rail (*Rallus longirostris yumanensis*) and the southwestern willow flycatcher (*Empidonax traillii extimus*), that have been observed and documented along the Gila River.

Places of concern in the study area that have numerous special status species include the Gila River, mountains, and the Vekol Valley. The Vekol Valley has sporadic grassland habitats that support a few species typically considered natives of the Great Plains.

Table 5-5 Special Status Species and Species of Concern Likely Found in the Study Area

Species	Status	Habitat Requirements	Occurrence in Study Area
Amphibians			
Great Plains Narrow-Mouthed Toad <i>Gastrophryne olivacea</i>	WSC	Mesquite semidesert grassland to oak woodland near streams, springs, and rain pools. Often found in deep, moist crevices or rodent burrows or under large flat rocks, dead wood, and other debris near water.	Documented in Vekol Valley and may occur near Seven Mile Mountain.
Lowland Leopard Frog <i>Rana yavapaiensis</i>	SC WSC	Aquatic systems from desert grasslands to piñon-juniper woodlands. Breeds in a variety of natural and manmade aquatic habitats with still water or running water.	May occur on Gila River.
Reptiles			
Sonoran Desert Tortoise <i>Gopherus agassizii</i> (Sonoran population)	SC WSC	Occurs primarily on rocky slopes and bajadas with upper Sonoran desertscrub. Caliche caves in incised washes (arroyos) are also used for shelter sites. Rarely found on shallow soils.	Documented in study area.
Arizona Chuckwalla <i>Sauromalus ater</i> (Arizona population)	SC S	Found near cliffs, outcrops, lava flows, or rocky slopes with boulders for basking and rock crevices for shelter.	Documented in study area in Maricopa Mountains
Mexican Rosy Boa <i>Charina trivirgata trivirgata</i>	SC S	Usually found on or near rocky mountains or hillsides with granite rock outcrops.	Documented in study area in Maricopa Mountains.
Red-Backed Whiptail <i>Aspidoscelis burti xanthonotus</i>	SC S	Canyons and hills from upper Sonoran desertscrub to juniper-oak woodlands. Also found in dense shrubby vegetation on the banks of semiarid permanent streams.	Documented in study area.

Species	Status	Habitat Requirements	Occurrence in Study Area
Birds			
Snowy Egret <i>Egretta thula</i>	WSC	Marshes, lakes, ponds, lagoons, mangroves, and shallow coastal habitats.	May occur on Gila River and nearby wetlands.
Great Egret <i>Ardea alba</i>	WSC	Marshes, ponds, estuaries, lakes, and marshy fields.	May occur on Gila River and nearby wetlands.
Western Yellow-Billed Cuckoo <i>Coccyzus americanus occidentalis</i>	C WSC	Streamside cottonwood-willow groves and large mesquite bosques for migrating and breeding.	Documented on Gila River in study area.
Black-Bellied Whistling-Duck <i>Dendrocygna autumnalis</i>	WSC	Found along rivers, ponds, stock tanks, marshes, and swamps with emergent vegetation. Prefers thickets of willow, mesquite, or cactus.	May occur on Gila River.
American Peregrine Falcon <i>Falco peregrinus anatum</i>	SC WSC	Found wherever sufficient prey occurs near cliffs and in open expanses. As Arizona's population grows, peregrines seem to be breeding in less optimal habitat that is more xeric than expected.	May occur in study area, but the habitat is suboptimal.
Western Snowy Plover <i>Charadrius alexandrinus nivosus</i>	WSC	Occasionally winters along the lower Gila River to as far north as Phoenix and Prescott on barren, sparsely vegetated salt flats and braided river channels.	Possible in migratory or winter habitat on Gila River.
Southwestern Willow Flycatcher <i>Empidonax traillii extimus</i>	LE WSC	Obligate of riparian habitats with dense canopy cover, a large volume of foliage, and surface water during midsummer.	Documented on Gila River in study area.
Western Burrowing Owl <i>Athene cunicularia hypugaea</i>	SC S	Habitat is variable in open, well-drained grasslands, steppes, deserts, and agricultural lands, often associated with burrowing mammals. Sometimes nesting burrows occur in vacant lots, golf courses, banks of washes, or airports.	Documented on agricultural land in study area.
Least Bittern <i>Ixobrychus exilis</i>	WSC	Breeds in freshwater and brackish marshes with dense, tall growths of aquatic or semiaquatic vegetation interspersed with clumps of woody vegetation and open water. Winters in brackish and saline swamps and marshes.	Documented on Gila River in study area.
Yuma Clapper Rail <i>Rallus longirostris yumanensis</i>	LE WSC	Breeds and winters in freshwater, brackish marshes, and side waters where the cattail and bulrush marshes are the tallest and most dense. Relocates when ground surface of marsh dries.	Documented on Gila River in study area.
Mammals			
Western Yellow Bat <i>Lasiurus xanthinus</i>	WSC	Roosts in palm trees or sometimes broad-leaved deciduous trees and tall yuccas (i.e., Joshua trees). Found in both native and human influenced habitats.	Adequate habitat on Gila River and developed areas.
Western Red Bat <i>Lasiurus blossevillii</i>	WSC	Riparian and other wooded areas. Roosts by day in trees. May occasion areas away from these habitats while foraging.	Adequate habitat on Gila River.
Lesser Long-Nosed Bat <i>Leptonycteris yerbabuenae</i>	LE WSC	Occurs from April to October in Sonoran Desert habitats with columnar cacti and large agave species.	Could forage in Maricopa Mountains and Sierra Estrella.
Pale Townsend's Big-Eared Bat <i>Corynorhinus townsendii pallescens</i>	SC	Arid lower elevations to pine forests usually around cliffs and rugged rock outcrops. Day roosts include rock crevices, caves, mines and human built structures.	Roosting and foraging habitat in study area.
Yuma Myotis <i>Myotis yumanensis</i>	SC	Arid lower elevations usually near cliffs and rock outcrops with a perennial water source. Day roosts include caves, rock crevices or manmade structures.	Roosting and limited foraging habitat in study area.

Species	Status	Habitat Requirements	Occurrence in Study Area
Pocketed Free-Tailed Bat <i>Nyctinomops femorosaccus</i>	SC S	Arid lower elevations near cliffs and rock outcrops. Roosts in rock crevices or manmade structures. Often roosts and forages near perennial water.	Roosting and limited foraging habitat in study area.
Cave Myotis <i>Myotis velifer</i>	SC S	Arid lower elevations usually around cliffs and rock outcrops. Day roosts include rock crevices, caves, mines, and manmade structures.	Roosting and limited foraging habitat in study area.
California Leaf-Nosed Bat <i>Macrotus californicus</i>	SC WSC	Desertscrub habitats with roost sites that include caves, mines, and deep grottos.	Documented in study area.
Greater Western Bonneted Bat <i>Eumops perotis californicus</i>	SC	Arid lower elevations usually around high cliffs or tall rock outcrops. Roosts in rock crevices during the day.	Roosting and limited foraging habitat in study area.
Plants			
Varied Fishhook Cactus <i>Mammillaria viridiflora</i>	SR	Occurs in semidesert grasslands, interior chaparral, piñon-juniper and oak woodlands with crevices, boulders, canyons, and gravelly igneous substrates.	May occur in upper elevations of the Sierra Estrella.
Emory's Barrel Cactus <i>Ferocactus emoryi</i>	SR	Rocky, gravelly, or sandy areas in Sonoran desertscrub at elevations of 1,500 to 3,000 feet.	Documented in study area.
California Barrel Cactus <i>Ferocactus cylindraceus</i> <i>var. cylindraceus</i>	SR	Gravelly or rocky hillsides, canyon walls, alluvial fans, and wash margins on igneous and limestone substrates.	May occur in the Maricopa Mountains and Sierra Estrella.
Tumamoc Globeberry <i>Tumamoca macdougallii</i>	S SR	Found in Sonoran desertscrub and is associated with nurse plants along sandy gullies, washes, and valley bottoms up to rocky upper bajadas	May occur in study area in Vekol Valley.
Yellow-Spine Prickly Pear <i>Opuntia engelmannii</i> <i>var. flavispina</i>	SR	Bajadas and mountains on rocky granitic soils at elevations of 1,650 to 2,600 feet.	May occur in study area.

NOTES: **Status Definitions:** **Endangered Species Act:** LE = listed endangered; LT = listed threatened; C = candidate (a species for which U.S. Fish and Wildlife Service has sufficient information on biological vulnerability and threats to support proposals to list as endangered or threatened under the Endangered Species Act; however, proposed rules have not yet been issued because such actions are precluded at present by other listing activities); SC = species of concern (has shown recent population decline to warrant this agency-only categorization to preempt decline and subsequent listing); **Bureau of Land Management:** S = sensitive (a species considered to have shown declines; Bureau of Land Management policy is to provide these species with the same level of protection as is provided for candidate species under *Bureau of Land Management Manual*, Section 6840.06C—that is, to “ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed”). **Arizona Game and Fish:** WSC = wildlife of special concern in Arizona (Arizona Game and Fish Department). **Arizona Native Plant Law:** SR = salvage restricted in Arizona (collection only with permit).

The final ecological assessment will list the special status species for the remainder of Maricopa County that were excluded from this list of species and the reasons for exclusion. That report also will include all agency correspondences with their project-specific recommendations as well as further information pertaining to the special status species enumerated above.

Vegetation Communities and Land Cover

The predominant native vegetation communities in the study area include Sonora-Mojave creosotebush-white bursage desertscrub in lowlands and Sonoran paloverde-mixed cacti desertscrub in mountains, upper bajadas, and xeroriparian areas (Table 5-6) (USGS National Gap Analysis Program 2004). Minor vegetation communities or cover types include another 11 classes (Table 5-6) (USGS National Gap Analysis Program 2004). The land use of the native

vegetation communities in the study area is typically native rangeland. Presently, the most common human-modified land cover type is agricultural land, but future development will convert this and much of the native vegetation to developed areas with suburban, urban, and industrial uses. Some areas may remain in a semi-native state within rural or open space parks.

Table 5-6 Present Land Cover and Vegetation Communities in the Study Area

Land Cover Type or Vegetation Community	Acres in Study Area	Land Cover Category
Sonoran-Mojave Creosotebush-Bursage Desertscrub	211,759	Native
Sonoran Paloverde-Mixed Cacti Desertscrub	89,191	Native
Sonoran-Mojave Mixed Salt Desertscrub	3,285	Native
Barren Land	67	Native
Open Water	178	Native
North American Warm Desert Riparian Mesquite Bosque	152	Native
North American Warm Desert Riparian Woodland and Shrubland	176	Native
North American Warm Desert Wash ¹	2	Invasive
Invasive Southwest Riparian Woodland and Shrubland	324	Native
Apacherian-Chihuahuan Mesquite Upland Scrub	32	Native
Sonoran Mid-elevation Desertscrub	813	Native
Madrean Piñon-Juniper Woodland	14	Native
Mogollon Chaparral	25	Native
Developed Open Space-Low Intensity	3,054	Human
Developed-Medium to High Intensity (Suburban, Urban, Industrial)	1,157	Human
Agriculture	19,522	Human

SOURCE: U.S. Geological Survey Regional Gap Analysis Program 2004

NOTE: ¹ Most desert wash vegetation is categorized as Sonoran paloverde-mixed cacti desertscrub.

Habitats

For the purposes of this report, native and invasive vegetation communities were combined into broader habitat aggregates for compatibility analysis. The names of human habitats were changed from the names in the USGS Regional GAP Analysis to those that correspond with names in the landscape inventory analysis provided by the District. Habitats for wildlife have been described in terms of these larger aggregates (Figure 5-2).

Wildlife

General Wildlife and Habitats

The study area supports a diverse array of wildlife species because of the proximity of mountains and upland areas to riparian, xeroriparian, and lowland habitats. In addition to these broader habitat divisions, local variations in the composition of vegetation, vegetation communities, and substrate contribute to the high species diversity in the study area.

Results indicated that 9 amphibian species are known to occur in the study area; those species include widespread generalists, riparian specialists, fine-textured soil specialists in valleys, coarse-textured soil specialists in bajadas with upland desertscrub, and a species that lives in montane upland desertscrub (Brenan and Holycross 2006). Approximately 46 reptile species, 53 mammal species, and 153 or more bird species occur or likely utilize habitats in the study area (Brenan and Holycross 2006; Corman and Wise-Gervais 2005; Birds of North America, accessed 2007; Hoffmeister 1986). These species occur in similarly divisible habitats, but agricultural areas, xeroriparian washes, and developed areas are also influential in affecting the distributions of these species. The bird fauna tends to be more diverse than other groups, because birds are more mobile, and their group of species includes breeding residents, transient migrants, and winter-only inhabitants. An inventory of these species is included in Appendix A.

Parts of the landscape are particularly diverse in the number and types of species occurring there. These include riparian habitats, places with surface water, and upland desertscrub habitats in mountains and bajadas (Figure 5-2). The Gila River, scattered mesquite bosques, and Waterman Wash are the primary riparian habitats in the study area. Additionally, the Gila River is categorized as a significant riparian area (Corman and Wise-Gervais 2005). Also, the Arizona Department of Environmental Quality classifies it as an impaired river because of accumulations of agricultural pesticides. Locations with upland desertscrub were described previously with the vegetation communities sub-section. Places with surface water include the numerous earthen livestock tanks that are scattered throughout the study area and a small man-made lake in Estrella Mountain Ranch.

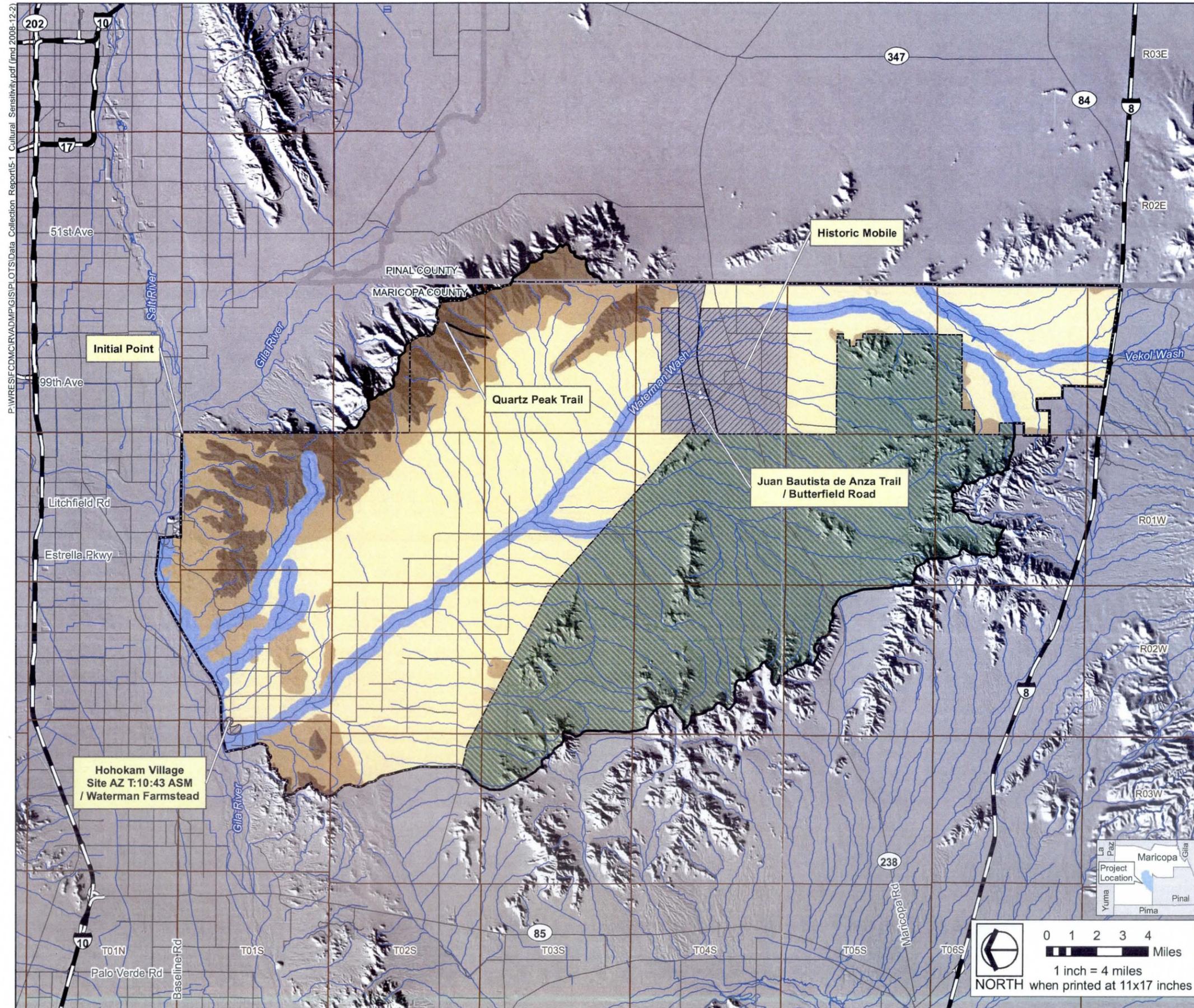
A number of other vegetation types are less diverse but important to wildlife in the study area. Saltbush desertscrub vegetation communities typically occur on sandy or fine-textured saline soils and usually have a unique assemblage of plants, reptiles, and terrestrial mammals. Large blocks of this vegetation type occur near the Maricopa Mountains (inside the Sonoran Desert National Monument) and south of Estrella Mountain Ranch (Figure 5-2). Creosotebush (lowland) desertscrub, because it occurs on the most developable land in valleys, has become increasingly threatened (Corman and Wise-Gervais 2005) and likely has lost more total acreage than most other types of desertscrub. Past development did little to consider the unique assemblages of species or the importance of lowland desertscrub to the overall ecological health of desert ecosystems. In the future, common lowland plants and wildlife that occur exclusively in lowland desertscrub may become rare and require special protection. Lowland desertscrub dominated by creosotebush and bursage can be found throughout the lowlands and valleys of the study area.

Wildlife corridors are an important resource that influences biodiversity, population dynamics, and access to important resources for wildlife species. Wildlife corridors or movement areas are particularly important for maintaining viable populations and genetic diversity of the desert tortoise (*Gopherus agassizii*), desert bighorn (*Ovis canadensis mexicana*) and other upland species occurring in or near the Maricopa Mountains, Sierra Estrella, and smaller inselbergs. The wildlife corridors identified by Beier et al. (2008) used a modeling process to locate linear arrays of optimal environments needed to maintain the connectedness of montane and foothills habitats utilized by the bobcat, bighorn sheep, desert tortoise, Gila monster, and javelina. Much of the property in these derived localities occurs on private land that has been planned for development, and future places available for wildlife movement would shift to potentially less optimal habitat on blocks of land administered by BLM that are outside of the modeled corridors. The alternative corridors or wildlife movement areas provided by AGFD typically occur on habitat that was considered as sub-optimal by the models of Beier et al. (2008) but are situated along blocks of public land that likely would be preserved in the future. These are the corridors that will be brought forward in the planning process and are located in the center and southeastern parts of the study area (Figure 5-2).

Rainbow Valley
Area Drainage Master Plan
Cultural Resource Sensitivity



Figure 5-1



Project Features

- Cultural Resource Assessment Area
- Sonoran Desert National Monument
- Cultural Resource Sensitivity Zones**
- Mountains - low sensitivity
- Foothills / Upper Bajadas - moderate sensitivity
- Lower Bajadas / Valley Plains - low sensitivity
- River Channel / Terrace - low sensitivity
- Selected Resources - high sensitivity (constraints or opportunities)

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/ Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
URS Corporation
Cultural Resource Data, 2008

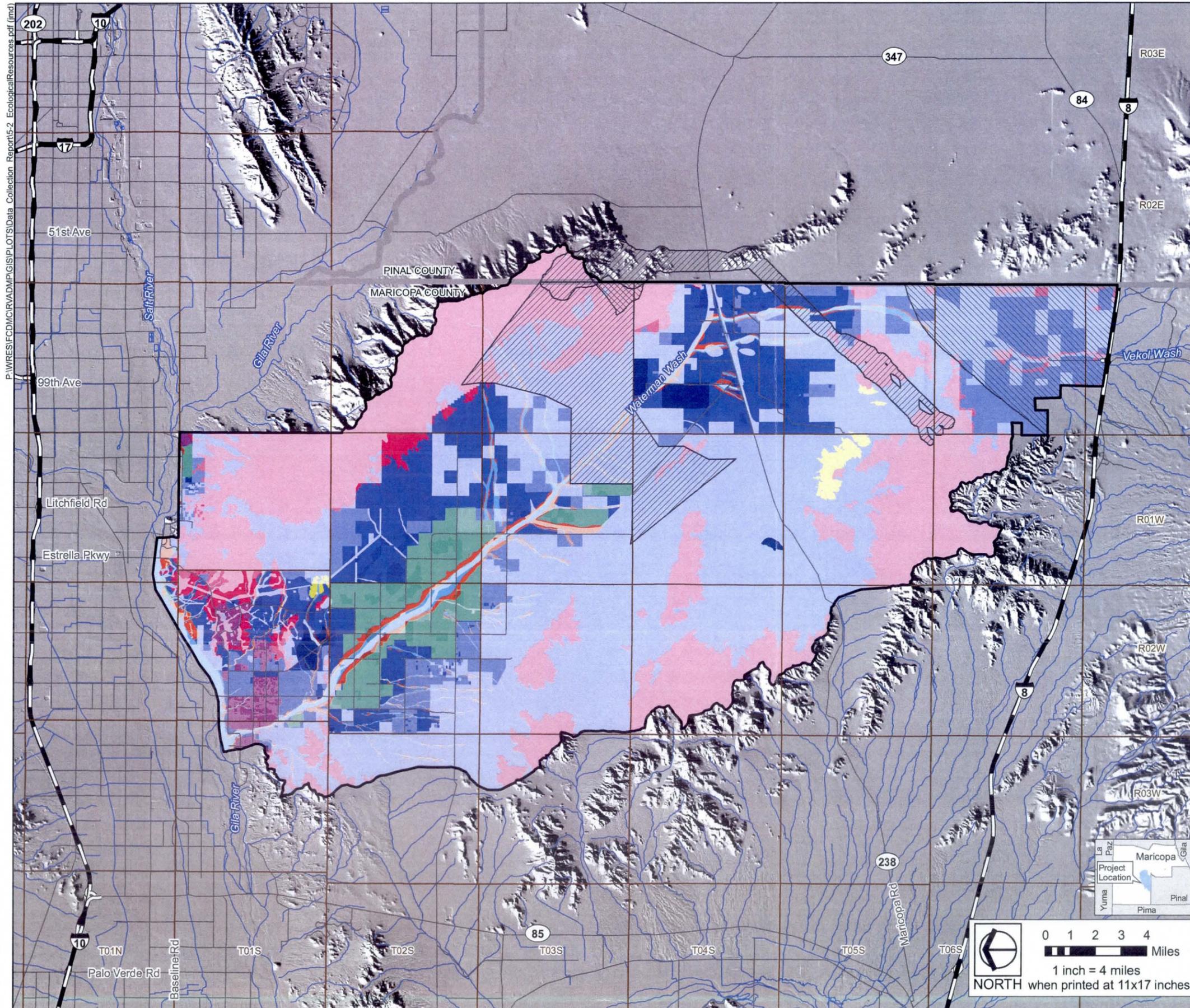
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Rainbow Valley
Area Drainage Master Plan
Ecological Resources



Figure 5-2



Project Features

Ecological Units

Agriculture		Mixed Creosote Scrub		Mountain Woodland	
Natural	Rural	Natural	Rural	Natural	Rural
Suburban	Urban	Suburban	Urban	Suburban	Urban
Industrial		Industrial		Industrial	
Developed		Mixed Salt Desert Scrub		Open Water	
Natural	Rural	Natural	Rural	Natural	Rural
Suburban	Urban	Suburban	Urban	Suburban	Urban
Industrial		Industrial		Industrial	
Floodway Fringe		Mixed Upland Desert Scrub		Riparian	
Natural	Rural	Natural	Rural	Natural	Rural
Suburban	Urban	Suburban	Urban	Suburban	Urban
Industrial		Industrial		Industrial	

Overlay Area

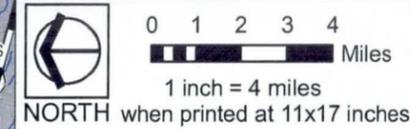
Vekol Valley Grassland Species Habitat	Wildlife Corridor
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Reference Features

County Boundary	Interstate Highway/Freeway
Rainbow Valley ADMP Boundary	Major Road
Township and Range Boundary	River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
Arizona Department of Game and Fish
Wildlife Corridors, 2008



6.0 SCENERY, RECREATION, AND OPEN SPACE RESOURCES

6.1 INTRODUCTION

The scenery, recreation, and open space resource assessment for the Rainbow Valley ADMP provides a preliminary assessment that (1) identifies, describes, and documents the future landscape character as well as the existing and planned recreation and open space resources of the study area; (2) assesses the compatibility of these resources with a variety of possible structure types and flood protection methods that may be implemented in the project alternatives; and (3) identifies landscape design themes that will enable project flood protection solutions to be contextually sensitive with the visual, recreation, and open space environments of the study area.

6.2 SCENERY RESOURCES

The Rainbow Valley ADMP study area is in the Sonoran Desert landscape character type. All three landscape character subtypes—the Sonoran mountain lands, valley lands, and river lands—are located in the study area. Of the 10 landscape character physical settings the Landscape Inventory and Analysis (LIA) identifies within Maricopa County, the following 9 settings occur in the study area within the following subtypes:

- Sonoran Mountain Lands Subtype
 - Mountains
 - Foothills
 - Upper Bajada
 - Lower Bajada
 - Arroyos
- Sonoran Valley Lands Subtype
 - Valley Plains
 - Valley Wash
- Sonoran River Lands Subtype
 - River Terrace
 - River Channel

According to the LIA, five landscape character cultural settings are found within Maricopa County: natural, rural, suburban, urban and industrial. Natural and rural are the two landscape cultural settings primarily found within the Rainbow Valley ADMP study area. The remaining

three landscape character cultural settings—suburban, urban, and industrial—do occur within the study area but are mostly limited to its northern boundary near the Gila River and Estrella Mountains.

Given the current development patterns of the Phoenix metropolitan area and the rate of growth anticipated for the study area, the existing landscape cultural settings will transition from the natural and rural settings to include more suburban, urban, and industrial areas. To adequately plan for the long-term life span of planned flood protection methods, it is crucial to look at those future landscape character units to develop context-sensitive solutions. Therefore, future land use data were obtained from municipalities and other agencies within the study area and combined with MAG's GIS land use data to generate future landscape character cultural settings.

Landscape character units are produced by combining the physical and cultural settings. The LIA shows 49 landscape character units in Maricopa County. Of those, 43 landscape character units are predicted to exist in the study area in the future. Table 6-1 lists those future landscape character units and their predicted distribution by acreage and by the percentage of study area they are expected to represent.

Approximately 75 percent of the study area is predicted to contain five future landscape character units: the natural lower bajada unit, natural mountains unit, natural upper bajada unit, natural valley plains unit, and the suburban valley plains unit. Table 6-1 shows the distribution of the future landscape character units within the study area.

Table 6-1 Future Landscape Character Units in the Rainbow Valley Study Area

Future Landscape Character Unit	Acres	Percent (%) of Acres
Industrial Foothills	7	>1
Industrial Lower Bajada	34	>1
Industrial Mountains	2	>1
Industrial River Terrace	>1	>1
Industrial Upper Bajada	19	>1
Industrial Valley Plains	2,079	>1
Industrial Valley Wash	43	>1
Natural Arroyo	3,376	1
Natural Foothills	5,617	2
Natural Lower Bajada	36,787	11
Natural Mountains	45,584	14
Natural River Channel	1,286	>1
Natural River Terrace	591	>1
Natural Upper Bajada	51,494	16
Natural Valley Plains	77,499	23
Natural Valley Wash	4,190	1

Future Landscape Character Unit	Acres	Percent (%) of Acres
Rural Arroyo	390	>1
Rural Foothills	538	>1
Rural Lower Bajada	10,623	3
Rural Mountains	250	>1
Rural River Channel	107	>1
Rural River Terrace	272	>1
Rural Upper Bajada	3,555	1
Rural Valley Plains	23,717	7
Rural Valley Wash	539	>1
Suburban Arroyo	321	>1
Suburban Foothills	1,170	>1
Suburban Lower Bajada	7,797	2
Suburban Mountains	358	>1
Suburban River Channel	172	>1
Suburban River Terrace	694	>1
Suburban Upper Bajada	4,756	1
Suburban Valley Plains	38,895	12
Suburban Valley Wash	716	>1
Urban Arroyo	38	>1
Urban Foothills	109	>1
Urban Lower Bajada	471	>1
Urban Mountains	2	>1
Urban River Channel	3	>1
Urban River Terrace	91	>1
Urban Upper Bajada	963	>1
Urban Valley Plains	4,676	1
Urban Valley Wash	37	>1

Context-Sensitive Planning

Appendix C provides photographs that show how the future landscape character units are predicted to be represented in the study area. In most cases, the future landscape character unit is expected to have similar visual elements, such as form and color, as the existing landscape character unit found in the study area today. Photographs of these existing landscape character units have been used when this is the case. In some cases, particularly where future urban and suburban development is predicted, photographs from areas within the Phoenix metropolitan area were used to represent the visual elements predicted in these landscape character units. Along with these photographs, a brief description of the predicted location and distribution of the future landscape character unit has been included for use in referring to Figure 9-7, *Opportunities and Constraints: Scenery Resources*, provided in Section 9. Appendix C also includes a list of the compatible landscape design themes described in Section 9.4 with the landscape character unit descriptions to serve as an aid in developing context-sensitive alternatives during the planning process. Detailed descriptions of the landscape character units and their associated visual

elements may be found in the District's *The Preliminary Landscape Character Assessment for Maricopa County* (District 2003).

6.3 RECREATION RESOURCES

The recreation resource information from the LIA was supplemented with information from the City of Goodyear pertaining to planned parks located within the project study area. Information pertaining to parks and trails was requested from the City of Avondale and the Town of Buckeye; however, additional information was not made available at the time of writing. The community map on the City of Avondale and Town of Buckeye's web sites were also reviewed for any information that may pertain to future parks and recreation planning in the study area. These regional and local recreational resources are shown on Figure 9-8 and listed in Table 6-2.

Table 6-2 Parks and Recreation Resources within the Rainbow Valley Project Study Area

Recreation Type	
<ul style="list-style-type: none"> ▪ Regional County Parks and Recreation <ul style="list-style-type: none"> - Estrella Mountain Regional Park - Sonoran Desert National Monument - Sierra Estrella Wilderness Area - North Maricopa Mountains Wilderness - South Maricopa Mountains Wilderness - Maricopa County Regional Trail - Juan Bautista de Anza National Historic Trail - Phoenix International Raceway 	
<ul style="list-style-type: none"> ▪ Local Parks and Recreation <ul style="list-style-type: none"> - Estrella Mountain Golf Course - Golf Club of Estrella - City of Goodyear community parks 	

Regionally Significant Parks and Recreation Resources

Existing and planned regional parks and recreational resources within the Rainbow Valley study area include the Estrella Mountain Regional Park, located south of the Gila River at the north end of the study area; the Sierra Estrella Wilderness Area, which comprises the southern portion of the Sierra Estrella and straddles the eastern boundary; the north and south Maricopa Desert Mountain wilderness areas along the western and southwestern boundaries; and the Sonoran Desert National Monument, which comprises a majority of the southwestern portion of the study area. Segments of the Maricopa Regional Trail are located within, and adjacent to the project study area. These segments include the Gila River, which runs along the project's northern boundary, Waterman Wash, and Riggs Road. There are additional alignments that will connect the Gila River and Sierra Estrella Wilderness Area with the Sonoran Desert National Monument.

The Juan Bautista de Anza National Historic Trail traverses the project area from west to east, crossing the southern boundary of the North Maricopa Mountain Wilderness Area and the Sierra Estrella. The Phoenix International Raceway (PIR) is also located in the study area, situated between the Gila River and the foothills of the Sierra Estrella.

Local Parks and Recreation Resources

Existing local recreation resources within the project area include two golf courses: the Estrella Mountain Golf Course located on the north side of the Estrella Mountain Regional Park, and the Golf Club of Estrella located in the Estrella Mountain Ranch Community in the City of Goodyear. Of the existing community parks identified within the City of Goodyear, one, the Foothills Community Park, is known to be located within the study area and is associated with the Estrella community. No existing parks or recreational facilities have been developed within the study area by the Town of Buckeye or the City of Avondale at the time of this study. The City of Goodyear's *City Park Master Plan* and the City of Avondale's *Parks and Recreation Master Plan* are being developed as this study is being conducted. This updated information was requested for inclusion in the recreation resource analysis but was not available at the time of this report. However, the City of Goodyear Land Use Plan, updated in 2008, has identified a number of proposed parks to be located within the north central portion of the study area. These parks have been incorporated into the Parks and Recreation Resources mapping developed as part of the study.

While not within the Rainbow Valley study area, other significant nearby regional parks and recreation facilities include South Mountain Park, the Buckeye Hills Recreation Area, and a number of community and neighborhood parks in the cities of Goodyear and Avondale and the Town of Buckeye.

6.4 OPEN SPACE RESOURCES

Open spaces within the Rainbow Valley Study Area range from secured open spaces, such as the Estrella Mountain Regional Park, to environmentally restrictive lands associated with conservation and retention areas identified in the *MAG Desert Spaces Plan*. Other potential open space resources include BLM lands, located predominantly in the Valley Plains and the Buckeye Hills area, Federal Emergency Management Agency (FEMA) regulated floodplains and floodways, and areas given open space designations within municipal land use plans. See Table 6-3 below for the distribution of the open space resources identified within the study area. The relationship of these open space resources within the Rainbow Valley study area can be found in Figure 9-9.

Table 6-3 Open Space Resources within the Rainbow Valley Project Study Area

Open Space Designation	Acres	Percent (%) of Study Area
Secured Open Space	137,886	42
Open Space Conservation Areas	6,134	2
Open Space Retention Areas	2,289	<1
Other Open Space Areas		
• Bureau of Land Management Land	39,594	12
Floodplain Floodway	1,438	<1
Floodplain Fringe and Other Floodplain Zones	10,483	3
City of Goodyear Open Spaces*	39,325	12

* City of Goodyear open spaces overlay other open space designations such as BLM land.

Secured Open Space

Secured open spaces, as identified in the *MAG Desert Spaces Plan*, include those lands that have federal, state, county, or local management designations that prohibit or strictly manage development in a manner that will ensure the continuation of open space benefits for future generations. Within the study area, these lands include the Sonoran Desert National Monument, which also encompasses the north and south Maricopa Mountain wilderness areas, the Sierra Estrella Wilderness Area, the Estrella Mountain Regional Park, as well as major FEMA-designated floodways.

Conservation Areas

Conservation areas include those areas of environmental importance that are not currently managed, such as the portions of the Sierra Estrella not contained in the County Park or Wilderness area, as well as portions of the Buckeye Hills. Development in these areas is typically restricted by natural constraints, such as steep topography or significant FEMA-designated floodplains. However, open space benefits within these areas are not entirely protected from future development by management guidelines or development codes.

Open Space Retention Areas/Environmentally Sensitive Development Areas

Open space retention areas, or environmentally sensitive development areas, are those areas identified in the *MAG Desert Spaces Plan* which are open to development where environmental considerations exist. Growth and development in these areas should retain the integrity and character of the natural environment through appropriate practices as outlined in the *MAG Desert Spaces Environmentally Sensitive Development Areas (ESDA) Policies and Design Guidelines* (MAG 2000). These areas include the upper bajada along the Sierra Estrella, as well as most floodplain regions.

Public Lands

Public lands managed by the BLM within the study area currently retain the character of the natural Sonoran Desert landscape. However, under certain conditions BLM lands may allow some practices such as grazing or mining, or may even be sold, which may impact the benefits typically associated with the open space resources.

City of Goodyear Open Spaces

In addition to the open space resources identified in the LIA, the City of Goodyear has identified Open Space preservation areas in its land use code. These areas primarily overlay BLM land and FEMA floodplains, adding an additional level of management to these areas.

7.0 PUBLIC AND STAKEHOLDER INVOLVEMENT

7.1 INTRODUCTION

Public and stakeholder involvement is integral to the planning process to ensure the development of an ADMP that receives political and community support and responds to and balances the needs of large landowners and the District. Early in the planning process, a stakeholder involvement plan was developed to identify agency and private stakeholders and provide guidance for informing and involving the stakeholders and documenting their issues or concerns throughout the planning process. Through implementation of the stakeholder involvement plan, issues should be identified early in the process and addressed throughout the range of alternatives.

Agency stakeholders have been defined as those stakeholders with political or land management jurisdiction within the study area. These stakeholders have regulatory authority and will likely be involved with implementation or enforcement of the plan. Private stakeholders include interested members of the public and large landowners, such as developers, that own 160 acres or more within the study area.

Stakeholder involvement was initiated with the agency stakeholder kickoff meeting on June 12, 2008. Following the kickoff meeting, individual meetings were held with agency and private stakeholders to supplement data collection and further identify issues and concerns. These meetings, as well as the identified issues and concerns, are discussed below. Following the completion of data collection, a general public meeting will be held to provide project information and allow the public to ask questions and provide comments. Additional group and individual stakeholder meetings are planned to be held throughout the project.

7.2 AGENCY STAKEHOLDER KICKOFF MEETING

The first meeting for the Rainbow Valley ADMP stakeholder group was held on June 12, 2008. The meeting began with a brief presentation to introduce the project team, provide the District's vision for the ADMP, and describe the project study area, schedule, opportunities, and constraints that would be considered during the siting and design of flood control structures.

The purpose of the meeting was to identify issues and concerns that stakeholders had regarding the study area. These issues would be considered throughout the project and would assist in identifying goals and objectives for the ADMP. During the presentation, goals and objectives were defined (the group later brainstormed goals and objectives, as described below). It also was noted that project performance criteria would be developed with the assistance of the stakeholder

group. The goals, objectives, and criteria would be used throughout the project to evaluate various alternatives, including how the alternatives are meeting the objectives for the ADMP. The District indicated that through the planning process, a context-sensitive solution would be identified that best considers and integrates land use and characteristics, flood hazards, performance criteria, and stakeholder values and input.



Agency Stakeholder Meeting

7.2.1 Issues and Concerns

The group was asked to participate in a facilitated brainstorming session to identify issues and concerns about the study area. Following the brainstorming session, group members were provided with a handout that summarized issues and concerns identified by stakeholders who attended the partnering session held in November 2007. Table 7-1 provides the compiled list of issues from both the November 2007 and June 2008 meetings. Issues and concerns are summarized by topic and entity.

Table 7-1 Stakeholder Issues and Concerns

Topics / Entities	Interests and Concerns
Flood Control District City of Avondale City of Goodyear ASLD	<ul style="list-style-type: none"> • Consider floodplain regulations. • Maintain washes in existing condition. • Consider and preserve Waterman Wash. • Implement bridges and low water crossings where applicable. • Define floodplain hazards. • Identify alluvial fans. • Consider how developers would mitigate floodplains. • Do not discharge onto State Trust land. • Be consistent with Section 404 permitting regulations.
Implementation District Maricopa County Planning Dept. City of Goodyear	<ul style="list-style-type: none"> • Consider Implementation of plan by stakeholders. • Assure that the product is useable, is easy to understand, and is meaningful to both planners and engineers.
Open Space Preservation AGFD District Maricopa County Parks and Recreation Dept.	<ul style="list-style-type: none"> • Provide connectivity. • Provide linkages between the Sierra Estrella and Buckeye Hills. • Consider the open space issue.
Parks and Recreation Maricopa County Parks and Recreation Dept. Town of Buckeye City of Goodyear City of Avondale ASLD BLM District	<ul style="list-style-type: none"> • Avoid impacts on Estrella Mountain Regional Park. • Maximize multiuse opportunities. • Allow OHV use. • Do not increase OHV access to Estrella Park and other adjacent areas (BLM). • Assure that trails provide connectivity. • Assure that trails equestrian access. • Protect existing parks and trails.
Land Use/Coordination with Existing Plans BLM ASLD Town of Buckeye City of Goodyear District	<ul style="list-style-type: none"> • Coordinate with <i>El Rio Watercourse Master Plan</i>. • Coordinate with Montage Development. • Obtain/be consistent with BLM <i>Resources Management Plan</i>. • Be aware that solutions on State Land could reduce maximum value. • Consider that Goodyear is developing design guidelines for Waterman Wash as part of its <i>General Plan Amendments</i>. • Consider the effect future transportation corridors will have on current land uses. • Consider the potential conflicts appearing on different land use plans and get most current data (e.g., BLM and city plans). • Be consistent with <i>Maricopa Regional Trail Master Plan</i>. • Be consistent with MAG's <i>Desert Spaces Plan</i>. • Be consistent with District's landscape and aesthetics policy.
Environmental BLM AGFD MCDOT Town of Buckeye Maricopa County Parks and Recreation Dept. City of Avondale	<ul style="list-style-type: none"> • Maintain wildlife corridors. • Address air quality issues (i.e., associated with OHV). • Maintain scenic views. • Consider the importance of connectivity of habitat . • Maintain secondary washes for species. • Maintain migration of bighorn sheep in and out of park. • Consider that wildlife utilize Waterman Wash. • Determine if subsidence is an issue.

Topics / Entities	Interests and Concerns
Development Community ASLD City of Avondale Town of Buckeye BLM City of Goodyear	<ul style="list-style-type: none"> • Work with ASLD as a developer. • Do not let development encroach washes. • Coordinate with developers during study. • Consider sustainability of future populations given anticipated growth. • Note that there is often pressure to change wash characteristics. to increase the amount of developable land.
Planning Process District MCDOT City of Goodyear ASLD	<ul style="list-style-type: none"> • Use consistent and appropriate approach for study. • Use appropriate transitions between urban and rural elements and land use changes. • Obtain input on hydrology assumptions, methodology, and results. • Develop project partners. • Use same datum for mapping and survey. • Consider context of area. • Consider existing or future land use as context. • Consider that the timing of the study is important because many projects are under way in the study area.
Transportation MCDOT City of Avondale Town of Buckeye	<ul style="list-style-type: none"> • Consider Riggs Road alignment. • Consider future transportation corridors (e.g., State Route 303L, Interstate 10). • Consider Goodyear Road alignment to Mobile. • Be aware of road corridors. • Take into account the new road crossing Gila River. • Note that transportation connectivity with other areas is important. • Consider that currently low-volume roads in the area could experience increase in use with expected development (e.g., an increase in particulate matter equal to or less than 10 microns in diameter). • Encourage employment corridors around roadways.
Utilities	<ul style="list-style-type: none"> • Note the utility corridor that transects Rainbow Valley. • Consider the Transwestern pipeline and existing utility.

NOTES: AGFD = Arizona Department of Fish and Game, ASLD = Arizona State Land Department, BLM = Bureau of Land Management, Dept. = department, District = Flood Control District of Maricopa County, MCDOT = Maricopa County Department of Transportation, OHV = off-highway vehicle

7.2.2 Goals and Objectives

Following the identification of issues and concerns, stakeholders separated into groups to identify the ADMP's goals and corresponding objectives. Those goals and objectives are described in detail in the meeting notes prepared for the kickoff meeting and are summarized below.

- Goal 1: Consider Compatibility with Land Use
- Goal 2: Preserve Wash Corridors in a Natural State
- Goal 3: Maximize Use of Developable Land

- Goal 4: Preserve and Enhance Wildlife Corridors and Habitat Resources
Manage/minimize Off-Highway Vehicle (OHV) Use
- Goal 5: Maximize Multiuse Opportunities
 - Hiking/Trails
 - Education
 - OHVs
- Goal 6: Develop Implementable Plan
Partner with Local Communities
Consider Multiple Uses
- Goal 7: Preserve Footprint for Existing and Future Transportation Corridors
- Goal 8: Consider Regional Connectivity (Estrella Mountain Regional Park, Sonoran Desert National Monument), Both Vehicular and Nonvehicular
- Goal 9: Plan Regional Facilities for Multiple Uses
- Goal 10: Design ADMP to Be Sensitive to the Context of the Surrounding Area (Responsive to Desired Character)
- Goal 11: Maintain and Ensure Public Safety
- Goal 12: Identify Areas in Need of Protection and Establish Appropriate Level of Flood Protection for Those Areas
Protect street Networks During Flood Events

Based on the issues, goals, and objectives identified by the stakeholders, the project team grouped related items and distilled them into a set of four generalized goals each with a list of supporting objectives. The resulting goals and objectives are described in Section 9.3 of this report. Those goals and objectives were then developed into performance criteria that will be used to evaluate plan alternatives to determine how each alternative meets the goals established at this meeting. The resulting performance objectives and the evaluation matrix are presented in Section 9.6.4.

7.3 ONE-ON-ONE STAKEHOLDER MEETINGS

Following the agency stakeholder kickoff meeting, one-on-one meetings were held with agencies and private stakeholders to collect information about current and future land use on large properties in the study area. These meetings also provided an opportunity for stakeholders to identify issues or concerns that should be considered during data collection or during development of plan alternatives. A summary of these meetings, including attendees, date, and discussion topic, is provided in Table 7-2. At each meeting, the project team reviewed current, relevant plans, shared information that had been collected and verified its accuracy, and requested data such as jurisdiction or development plans. One-on-one meetings will continue throughout the project to provide additional opportunities to share and review information.

Large landowners (in addition to those identified in Table 7-2) will be identified through the development of a GIS query and project mailing list prior to the distribution of the first newsletter, and a letter will be provided to landowners advising them that the District will welcome any project discussions either at the public open house or in a one-on-one meeting.

Table 7-2 One-on-One Stakeholder Meetings

Jurisdiction/Representation	Date	Summary of Discussion
<i>State</i>		
Arizona Department of Transportation Monica Baiza Velvet Mathew	June 18, 2008	The meeting discussed Loop 303 and Loop 801 and their respective intersections with the study area and the Liberty area. Several 4F properties have been identified as challenges to the progress on both loop projects. The 4F report will be in by the end of 2008, and the State Historic Preservation Office is expected to provide concurrence by March 2009.
Arizona State Land Department Manny Patel Flood Control District of Maricopa County Debbi Shortal	July 4, 2008	No State Trust lands are currently being studied within Rainbow Valley ADMP. According to Arizona State Land Department objectives, a plan should be developed to avoid/minimize impacts on United States waters.
<i>County</i>		
Maricopa County Department of Transportation Mike Sabatini Tim Oliver Flood Control District of Maricopa County Burke Lokey	June 26, 2008	MCDOT has no plans for the area. Goodyear is conducting all current planning. There are two corridors for Loop 303, south of Gila River. As-built plans of MCDOT structures will be provided as available. Bridge locations have been identified for the Gila River.
Maricopa Association of Governments Bob Hazlett Flood Control District of Maricopa County Debbi Shortal Burke Lokey	July 24, 2008	Goodyear governs most of the nonfederal land in the study area. Newland Communities (Estrella Mountain Ranch) and Langley Development (Cimarron/Vekol Valley) may influence future development trends in the Rainbow Valley ADMP area. The Maricopa Association of Governments and Goodyear are involved in studies that may influence transportation plans in the Rainbow Valley ADMP area (i.e., parkway along Cotton Lane in the Rainbow Valley ADMP area). Sensitive areas include the Sonoran Desert National Monument; recommendations have been made to accommodate sensitivities. Developer plans will dictate arterial roads. All roads are based on build-out conditions. Future land use is based on growth through 2030.

Jurisdiction/Representation	Date	Summary of Discussion
<p>Maricopa County Planning and Development Matthew Holm</p> <p>Flood Control District of Maricopa County Debbi Shortal Burke Lokey Jon Loxley</p>	August 6, 2008	<p>Goodyear regulates most of the study area. Lot splits present challenges to MPD because drainage regulations may not be followed when washes may be filled, altering flow patterns. The largest subdivision in study area is Liberty Park (400 acres). Lufthansa has a testing facility in an area near two landfills. The Butterfield landfill may exist for a long time. Vekol Valley development has water and sewer services 40 to 50 miles away. Federal lands within the development may be disposed. MPD sees all master plans, even if there are no regulatory floodplains. Arizona Public Service is studying Rainbow Valley ADMP area for potential transmission corridor adjacent to the El Paso Gas Line corridor. Solar projects are planned for the area, but are delayed due to long regulatory process. A Rainbow Valley military training route exists between Luke Air Force Base and Goldwater Range. Maricopa County sets land designation for unincorporated land, recommending but not establishing open space land use. The Rainbow Valley area plan is four years old and available online. MPD will provide drainage reports and GIS data.</p>
<p>Maricopa County Parks and Recreation Department Chris Coover</p> <p>Flood Control District of Maricopa County Debbi Shortal Burke Lokey Jon Loxley</p>	August 6, 2008	<p>MC Parks foresees no impact on Estrella Mountain Regional Park and has no comments. No flood control is needed within Estrella Mountain Regional Park, but a flood control facility may be needed on the south side adjacent to park. P&R would make it a multiuse facility. Care should be exercised regarding the bighorn sheep in that area. The Maricopa Regional Trail System is outside the study area. A three-stage priority plan was adopted in 2004 and will be implemented over the course of the next 20 or more years. Placement of trail corridors is flexible within planned corridors. MPD sees development plans if they involve County trails. P&R has final approval. Developer must provide access to easement and/or build the trail. P&R looks to the District for aesthetic/safety and to Arizona Department of Fish and Game for wildlife, though corridors typically are not wide enough for wildlife. Trails on state land are in right-of-way; if elsewhere, trails are within easement. A P&R master plan is due this fall, but it should not include any plans for the Rainbow Valley ADMP area.</p>

Jurisdiction/Representation	Date	Summary of Discussion
<i>Local</i>		
City of Goodyear Keith Brown Joe Schmitz Brian Barnes	June 25, 2008	Rainbow Valley ADMP channel corridors and retention basin locations are important to Goodyear for future planning. The first flush basin may override Goodyear's requirement of 100 years 6 hours duration storm with prior City approval. Sonoran Valley Parkway design is 30 percent complete and includes a drainage report and wildlife corridor crossings considerations. That project is on hold due to the environmental impact statement required by BLM. Estrella Mountain Ranch and Amaranth developments are under way in areas influenced by developers; Madera is proposing a 65-acre linear park in channel corridor. A draft of Goodyear's <i>Park Master Plan</i> will be presented to the Board of Directors in July 2008. A <i>Water/Wastewater Master Plan</i> exists for a portion of the study area. Water reclamation plants are planned for the area adjacent to Waterman Wash and possibly in one more area. A Goodyear street circulation plan can be provided, along with GIS data and drainage reports. A request will be submitted to Montage Development for Amaranth and Sonoran Valley Parkway information.
City of Avondale Charles Andrews Harley Maniago Dan Davis Greg Beard Chris Hamilton Scott Wilken Flood Control District of Maricopa County Debbi Shortal	July 9, 2008	Avondale does not have capital improvement projects planned for the area is interested in sharing facilities with Goodyear. Avondale's <i>General Master Plan</i> shows open space in the study area; however, the City would like more open space and any future development may be low density. Avondale will complete <i>Parks Master Plan</i> for the area north of the Estrella Mountains in November 2008. Planned parks and trails will connect the Tres Rios and El Rio riparian areas.
Town of Buckeye Dave Showen Robert Wisener Flood Control District of Maricopa County Debbi Shortal	July 9, 2008	Buckeye has no capital improvement projects planned for the study area. The Waterman Wash watershed may be in Buckeye's study area, but not within Town boundaries. The Rainbow Valley ADMP area has been designated as open space. A trail system is planned for the Rainbow Valley ADMP area with trailheads outside the study area. Buckeye will have to acquire right-of-way for trails. A new natural gas pipeline will be constructed in study area in the next one to three years.

Jurisdiction/Representation	Date	Summary of Discussion
Developers/Large Landowners		
Newland Communities Pete Teich Wojciech Mrugala Flood Control District of Maricopa County Debbi Shortal Burke Lokey	October 3, 2008	The meeting discussed existing/future plans for the Estrella Community and reviewed visual character, recreation, and open space data collection for the Rainbow Valley ADMP study area. Newland is planning a 12,000-acre development adjacent to Estrella Mountain Regional Park that would contain a portion of the Waterman Wash, 5 miles of trails that have already been implemented, and a Desert Interpretive Center. The plat was determined to be within a Federal Emergency Management Agency Special Hazard Area.
Langley Holdings Aggie Kirschmann Flood Control District of Maricopa County Debbi Shortal Burke Lokey	October 6, 2008	Langley Land Cimarron Development (Vekol Valley) will be a 6,500-acre noncontiguous development within the Waterman and Vekol wash watersheds. The project is in early planning stages with no schedule for completion. The meeting reviewed visual character, recreation, and open space data collection for the Rainbow Valley ADMP study area. Langley must work on transportation issues with Maricopa Association of Governments, ensure water availability, and swap land with the BLM. Development will maintain existing natural and rural character.
Newland Communities David Prescott	October 13, 2008	The meeting discussed existing/future plans for the Estrella community and reviewed visual character, recreation, and open space data collection for the Rainbow Valley ADMP study area. Eight thousand acres of the 20,000-acre development will require six take-downs. Open space/park area plans will include a 22-mile-long portion of the Waterman Wash. One hundred acres will have wetlands with reclaimed water recharge function.
Montage Holdings Tim Keenan Flood Control District of Maricopa County Burke Lokey	October 27, 2008	The meeting discussed multiuse, context-sensitive goals and objectives of the Rainbow Valley ADMP and information was obtained about the Amaranth development. The 690-acre development is in final plat, but the project is on hold due to market. Development will begin in three to five years. Twenty-seven acres are Section 404 delineated and are intended for a wash concept. It was suggested that Montage review Goodyear's Waterman Wash conceptual development plans. There are no split-flow conditions in the plans. Future considerations are the number of cars traveling through area and the building height maximum. The Gila River community and Montage have developed a relationship and are discussing sharing utilities.

Jurisdiction/Representation	Date	Summary of Discussion
<p>Ellman Companies Kelly Hall</p> <p>CVL Terry Lewis</p> <p>Flood Control District of Maricopa County Debbi Shortal Burke Lokey</p>	November 4, 2008	<p>The meeting discussed existing/future plans for King Ranch development. Ellman Companies acquired the development in August 2007 and would like to expand current commercial aspects of the plan. The District has no projects planned for next five years, but it is looking for projects to include in its capital improvements program. EcoPlan Associates, Inc is helping Ellman with a habitat mitigation area adjacent to Gila River and along Cotton Lane Bridge. Ellman will seek connection points to El Rio linear park versus redesigning it. King Ranch redesign plans will be done in a year and construction will begin in 2011 with plans for incorporating washes.</p>

NOTES: ADMP = area drainage master plan, BLM = Bureau of Land Management, District = Flood Control District of Maricopa County, GIS = geographic information system, MCDOT = Maricopa County Department of Transportation, MPD = Maricopa County Planning and Development, P&R = Maricopa County Parks and Recreation Department

8.0 PLANNED LAND USE

8.1 INTRODUCTION

Up to this point, the Data Collection Report has presented conditions within the study area as it exists today. This section summarizes planning for future growth that has been undertaken by various groups and entities that will influence the drainage planning undertaken as part of this project. The planning under consideration includes land use plans developed by public agencies, private developer plans, and plans reported by the public and owners of relatively large private land holdings.

8.2 DRAINAGE PLANS

As mentioned in previous sections, most of the study area is undeveloped. Consequently, there have not been many large drainage studies done for the entire watershed. The City of Goodyear's *Conceptual Corridor Study for Waterman Wash* (RBF Consulting, February 25, 2008) is the key drainage plan that will influence the development of the Rainbow Valley ADMP. That study describes the City of Goodyear's plan for implementing open space and trail components related to its *General Plan Amendments* that are south of the Gila River and along the 22-mile-long reach of Waterman Wash. The goal of the study is to provide guidelines and dialogue with development interests in the Rainbow Valley area during the planning process. The study provides key understanding and city expectations relevant to development in the corridor so that the City Council, staff, and developers will work together in implementing the City's vision.

The process began in August 24, 2007, when RBF Consulting met with City staff in developing the initial goals and objectives of the study. Over the next few months, input from the District and U.S. Army Corps of Engineers was gathered in preparing the draft document. The study reports on both regulatory and technical input from these agencies. It states that area development in the floodplain/floodway of Waterman Wash that will impact the floodplain/floodway is the direct responsibility of the developer. Improvements as a result of the impacts will be shared by all impacting developers along the corridor through a special taxing district or other means. If a contiguous landowner to Waterman Wash does not impact the floodplain/floodway, it is not responsible for any improvements or mitigation requirements. At this time, the City of Goodyear is not planning to be a partner in these improvements. The study provides guidelines to developers on modifications to Waterman Wash in the corridor, including water depth, channel side slopes, trails, buffers, recreation, wash crossings, wildlife corridor enhancement and preservation, and aesthetics. The City of Goodyear is considering making the corridor a Special Area Plan.

8.3 LAND USE PLANS

Several land use plans that have been developed for the study area designate land uses, trails, and open spaces and involve preservation. The land use plans that will affect the Rainbow Valley ADMP are described in this section.

8.3.1 City of Goodyear General Plan 2003-2013

The *Goodyear General Plan 2003-2013* “provides the foundation for the elements and implementation program that will guide growth and development decisions within the City’s 135 square mile Planning Area” (City of Goodyear 2003). The plan considered factors besides land use that may influence the ADMP. Those other factors include circulation, water resources, parks and open space, and the environment. Based on conversations with Goodyear, there has been coordination with the Maricopa Association of Governments (MAG) for the land use designations to achieve consistency throughout the study area.

8.3.2 Sonoran Valley Planning Area, Proposed Major General Plan Amendment, City of Goodyear, Arizona

The *Sonoran Valley Planning Area Amendment*, a proposed major amendment to the *Goodyear General Plan 2003-2013*, would control the future of the newly incorporated areas south of the Gila River. That area covers approximately 95 square miles and includes areas to the east of the Sonoran Desert National Monument, north of a boundary 2 miles south of State Route 238, south of the Gila River, and generally west of the Pinal-Maricopa County boundary. Growth in the area is expected to occur over the next 20 to 30 years with a projected population of 205,000 people and 57,000 jobs. This growth will require vehicular access and mobility as well as public facilities and utilities that conform to the quality of life expected by residents and businesses. The amendment was developed to assure the quality of planned development by addressing critical land use, transportation, and infrastructure issues.

The goal of the amendment is to “create a fiscally sustainable area that contributes to the quality of Goodyear” and to have “growth pays for growth” so future development does not burden the citizens of Goodyear. (City of Goodyear 2007b:6). The *Sonoran Valley Planning Area Amendment* includes criteria and specific policies to accomplish the vision that the City of Goodyear has for the area. The amendment also offers a means to provide adequate fire protection, schools, sewer collection and treatment, a potable water supply and distribution system, and stormwater/flood control to achieve a sustainable community.

8.3.3 City of Avondale General Plan

On June 17, 2002, the City of Avondale adopted its *General Plan*, which included a section on land use planning within Avondale's city limits. The purpose of the plan is to provide "a vision to guide growth and development through 2012" (City of Avondale 2002:1). The *General Plan* is organized into themes and land use elements. The five themes that are part of Avondale's vision include land use, economic development, neighborhoods, open space, and civic infrastructure. The land use elements that most impact the Rainbow Valley ADMP study include open space; environmental planning, conservation, and recreation (open space theme); circulation and water resources (civic infrastructure theme); and land use.

Avondale's city limits mostly lie north of the Gila River. However, a portion of Avondale does fall within the Rainbow Valley ADMP study area. Two developable areas could be considered in the ADMP, one zoned for mixed use and the other for rural, low-density residential use. Both are contiguous to the Gila River, but neither are part of the Waterman Wash watershed. The Estrella Mountain Regional Park and some BLM property are also within Avondale's city limits south of the two developable properties. A portion of these properties are in Waterman Wash.

8.3.4 Town of Buckeye General Plan Update

On January 18, 2008, the Town of Buckeye updated its *General Plan* of September 18, 2001. The update states the community's vision for the area within its 595-square-mile town limits and offers goals, policies and an implementation plan to manage Buckeye's anticipated growth over next 20 years. The update also discusses seven planning elements: land use, growth area, circulation, economic development, environmental planning, water resources, and cost of development. That discussion touches on Buckeye's strategy for open spaces, recreation, wildlife habitat, drainage, floodplains and other issues that could affect the development of the Rainbow Valley ADMP. Buckeye's land use map was updated in January 2008; the original *General Plan* includes maps of the proposed road circulation plan and floodway transitional areas.

The Rainbow Valley study area coincides with the Town of Buckeye south of the Gila River and east of Watson Road. Most of this area is planned as open space according to the 2008 land use map. A small area bounded by 207th Avenue, Riggs Road, Airport Road, and Pecos Road is in lower Waterman Wash and may include some land in the Waterman Wash floodplain/floodway, although that is not shown on Buckeye's floodway transitional areas map. That area is zoned for low-density residential use (1.01-3 dwelling units per acre).

8.4 MASTER-PLANNED COMMUNITIES

Information regarding residential development was gathered from the District, the City of Goodyear, and MAG. The data were then combined to provide an overview of all planned and active master-planned communities in the study area (Figure 8-1). Estrella Mountain Ranch is the largest of those master-planned communities, comprising 31.83 square miles, or approximately 10 percent of the study area. (To date, the only new home construction has been in Estrella Mountain Ranch, specifically Estrella Region I.) The next largest developments are Amaranth, at 14.78 square miles, and Cimarron, at 8.54 square miles. Altogether, 76.81 square miles are currently planned to be developed as master-planned communities within the Rainbow Valley ADMP study area.

8.5 TRANSPORTATION PLANS

Two transportation plans are being developed for locations within the study area. Once agency approval of those transportation plans is obtained, the established transportation corridors may influence the layout of flood control facilities. Those plans are discussed in this section.

8.5.1 Sonoran Valley Parkway (City of Goodyear)

The planned Sonoran Valley Parkway alignment would be adjacent to the Sonoran National Monument and pass through BLM property. The purpose of the parkway is to provide access to the future Amaranth development, the community of Mobile and Interstate 8. An environmental impact statement was initiated in early 2007 and was taken through the public scoping phase; however, the developer that was funding the project has halted the project indefinitely. The City of Goodyear may be taking ownership of the project in order to obtain approval from BLM.

8.5.2 I-8/I-10 Hidden Valley Transportation Framework Study (MAG)

The purpose of the I-8/I-10 Hidden Valley Transportation Framework Study is to improve traffic flow and provide north-south and east-west high capacity corridors to handle present and forecast growth in southwest Maricopa County and provide connectivity with Pinal County. By defining corridors for the future principal arterial network, the study allows communities, town and cities to set aside land for the projects and to develop funding strategies. The study also provides guidance in determining the roles of future modes of alternate transportation.

The planning and development of the framework study required collaboration among state, county and local governments as well as public and private property owners and the public at large. The result is the selection of a Preliminary Framework Recommendation, as updated February 4, 2009 by the Maricopa Association of Governments. The southern extension of the

Loop 303 and Loop 303 Spur, the Sonoran Valley Parkway, proposed De Anza Scenic Way along the State Road 238 corridor, City of Goodyear enhanced transit corridor and a segment of the Hassayampa Freeway all traverse the Rainbow Valley Study Area and will be considered in developing the ADMP.

9.0 DRAINAGE PLANNING

9.1 INTRODUCTION

This section provides information critical to the planning process in terms of flood hazards to be mitigated, goals and objectives for mitigation, land planning influences, and compatibility of flood protection measures with their settings. Familiarity with the study area and the information in this section will form the basis for identifying flood hazard mitigation solutions and strategies in the Rainbow Valley area.

9.2 FLOOD HAZARDS

Floods—and particularly, flash floods—are one of the more common hazards in Maricopa County. Flash floods can occur rapidly and can develop without any indication of rain. Different types of flood hazards exist in Maricopa County, and many of them are found in the study area. The various types of flood hazards in Maricopa County and are described in detail in the District's "Piedmont Flood Hazard Assessment for Flood Plain Management for Maricopa County, Arizona" (Hjalmarson 2003) as discussed in Section 3. Key flood hazards in the study area include riverine, sheet flow/unconfined, tributary, distributary, and alluvial fan flooding.

9.2.1 Areas of Flooding

Research on historical records yielded little information for historical flooding in the study area. A staff member with the Mobile Elementary School provided information for the area around the Town of Mobile.

The historical flooding areas around Mobile are shown on Figure 9-1 and are summarized below:

- **Intersection of State Route (SR 238) and 91st Avenue**

This area frequently floods during rainstorms. The area at the intersection is lower than the adjacent grade, and the highway does not adequately drain the flows. The ponding in this area can block traffic to residents and the landfills.

- **99th Avenue Crossing of Waterman Wash**

This area experiences regular flooding, with the flows often being deep enough to block access across 99th Avenue. Local residents believe that the flooding has increased in this area due to the diversions of the waste management landfill. Runoff is directed toward Waterman Wash upstream of the 99th Avenue dip crossing.

- **SR 238 Dip Crossings**

The dip crossings that convey flow across SR 238 frequently flood during storm events. Poor grading adjacent to various dip crossings causes ponding that often hinders traffic along the highway.

9.2.2 FEMA Floodplains

The major FEMA floodplains in the Rainbow Valley ADMP study area are shown on Figure 9-2 and are situated primarily along Waterman Wash, which is delineated as Zone AE. Zone AE is a floodplain for which base flood elevations have been provided. The Waterman Wash flood zone includes a floodway that has been mapped along its entire length. Numerous tributaries to Waterman Wash have been mapped as Zone A floodplains with administrative floodways. Additional locations mapped as Zone A floodplains and administrative floodways include an area upstream of the farm fields that border Waterman Wash as well as the multiple washes that flow into the Gila River.

An area north of the UPRR tracks between 99th Ave and Waterman Wash has been designated as Zone X1, which is defined as an area outside the 500-year flood zone and protected by a levee from 100-year flood. Along the southern, upstream side of the UPRR tracks, approximately 4.5 miles of Zone A floodplain with administrative floodway have been mapped, representing the diversion of flow along the upstream side of the track between culverts and bridges.

The Rainbow Valley ADMP study area also includes portions of the Gila River Zone AE floodplain and floodway. The remaining portions of the study area have been designated either as Zone X1 or as Zone D, defined as an area of undetermined, but possible flood hazard.

9.2.3 Flood Hazard Ratings

The severity of potential flood hazards in the study area have been rated according to the flow characteristics associated with various landforms (shown on Figure 3-1) and the cultural setting, which includes anticipated land use. The flood hazard potential of each flow characteristic area or cultural setting is rated as low, medium, or high as it relates to the flood hazard posed to development in that area. The individual ratings are combined using GIS to develop a composite flood hazard rating for each combination of flow characteristic area and cultural setting. As an example, an alluvial fan is rated as a flood high-hazard area due to the uncertain flow path and sediment transport characteristics of the landform. An urban or industrial area would be considered a high hazard for flooding due to the area's density and high economic value. An urban land use imposed on an alluvial fan landform would be a combination of two high-hazard

areas, resulting in a combined flood hazard rating of “high.” Conversely, a sheet flow area, which is assigned a medium hazard rating due to relatively shallow, low-velocity flow characteristics, would result in a combined hazard rating of “low” when combined with a rural development having a low hazard rating. The flood hazard ratings for each combination of flow characteristic and cultural setting are shown in Table 9-1.

Table 9-1 Combined Flood Hazard Rating

Flow Characteristics	Natural	Rural	Cultural Setting		Industrial
			Suburban	Urban	
Mountain Slopes	L	L	L	L	L
Stock Ponds	L	L	L	M	M
Sheet Flow/Disturbed Flow	L	L	L	M	M
Piedmont Tributaries	L	L	M	M	M
Piedmont Distributary Flows	L	L	M	H	H
Major Rivers and Tributaries	L	L	M	H	H
Alluvial Fans	L	M	M	H	H
FRS/Dams	L	M	M	H	H

Using the combined flood hazard ratings in Table 9-1, flood hazard ratings can be mapped for the entire study area. The resulting flood hazard map can be used to identify areas that would benefit most from flood control measures. The majority of the planning effort can then be focused in areas exhibiting the highest flood hazard ratings. (Using this methodology, any location within the study area that is expected to remain natural, i.e., not planned for development, would receive a low hazard rating regardless of the flow characteristic landform.) The derivation of Table 9-1 can be found in Appendix D.

9.3 PROJECT GOALS AND OBJECTIVES

The purpose of the Rainbow Valley ADMP is to quantify the extent of flooding problems and to develop solutions by (1) evaluating and refining existing drainage studies conducted in the study area and (2) performing additional analysis for locations in the study area that have been inadequately studied or for which no information exists. Section 9.3.1 describes the two major objectives in the development of the flooding hazard solution.

9.3.1 Goals and Objectives Pertaining to the Study

The first objective of the study is to develop a multi-objective plan that mitigates identified stormwater hazards while maximizing opportunities to protect and restore the natural and beneficial functions of floodplains within the study area. Mitigation of stormwater hazards will involve development of regionally scaled systems designed to convey and/or store the runoff

generated by the 100-year rainfall event. The natural and beneficial functions of floodplains include, but are not limited to, the following:

- Natural Storage and Conveyance of Flood and Sediment
- Water Quality Maintenance
- Groundwater Recharge
- Biological Productivity
- Fish and Wildlife Habitat
- Harvest of Natural and Agricultural Products
- Scenic Resources
- Recreational Opportunities
- Areas for Scientific Study and Outdoor Education

The second objective is for the planning and design process to identify key issues; develop goals and objectives pertaining to multiple resource function areas; characterize and document human, biotic, and abiotic aspects of the landscape; formulate alternatives that fully integrate multiple resource objectives; and evaluate alternatives based on accomplishment of identified goals and objectives for the study. The goals and objectives for the study are derived from the District's mission, preliminary data collection efforts, and input from the agencies and stakeholders.

9.3.2 Goals and Objectives Pertaining to Multiple Resource Function Areas

Project goals and objectives were established at the beginning of the project based on input and discussion at the agency stakeholder kick-off meeting. The results of the stakeholder input are summarized in Section 7.2. The stakeholder input was reviewed by the project team and grouped into similar themes, resulting in four project goals with a number of supporting objectives, as follows:

Goal No. 1 – Provide Flood Hazard Protection for Public Safety

- Resolve or manage existing identified flooding problems.
- Prevent development in floodplains and in floodprone areas not identified as floodplains.
- Maximize the area receiving flood protection from the plan.
- Minimize or eliminate reliance on mechanized or human intervention for operation during a storm event.

- Provide capacity in channels for anticipated mature vegetation requiring realistic levels of maintenance.
- Preserve or replace the storage capacity of natural channels to attenuate discharges.
- Maintain natural flow paths and drainage patterns.

Goal No. 2 – Provide Multipurpose Benefits to the Community

- Provide opportunities to implement the Maricopa Regional Trail.
- Provide opportunities to implement other local trail systems (i.e., City of Goodyear trails, Juan Bautista Historic Trail, stakeholder-identified trails).
- Provide opportunities to implement local municipal and other stakeholder-identified recreational objectives and facilities (e.g., City of Goodyear planned parks, the Estrella development's park along Waterman Wash).
- Establish an east-west recreation/open space connection between the Sierra Estrella and the Maricopa Mountains/Sonoran Desert National Monument.
- Provide the opportunity to implement a recreation/open space feature at the confluence of the Gila River and Waterman Wash.
- Protect or enhance natural resources.
- Protect or enhance cultural resources.
- Preserve the wildlife movement corridor.
- Preserve and complement the desired visual character of future natural, rural, suburban, and urban cultural settings.
- Extend the natural scenic character of Waterman Wash to the south in areas where it currently is not well defined.
- Maintain and enhance sensitive views (i.e., consider the influence of flood protection on the views from the mountain recreation areas into the valley as it develops, and from the valley to the mountains).
- Improve and restore the areas containing visually discordant features, particularly along Waterman Wash.
- Retain and preserve distinctive natural and cultural scenic features and areas (i.e., riparian areas and washes, green-up areas, bajadas, and mountains)
- Maximize the creation/preservation of open space consistent with the *MAG Desert Spaces Plan* (i.e., maintain AGFD wildlife corridor, establish habitat areas along washes)

Goal No. 3 – Regional Land Planning Compatibility

- Use best available general plan data for planning.
- Coordinate with development plans.
- Support City of Goodyear's open space and agricultural land use designations as identified in *Goodyear General Plan 2003-2013*.
- Recognize and support planned transportation corridors in planning.
- Coordinate with adjacent planning areas for regional connectivity.
- Coordinate with other agency plans in the study area.

Goal No. 4 – Develop an Implementable Plan

- Gain support for the plan from potential funding partners.
- Identify multiple partnering opportunities.
- Develop a phased plan for implementation to spread expenditures over time.
- Encourage implementation by others.
- Meet Clean Water Act requirements for protecting waters of the United States.

These goals and objectives represent the shared vision of what the project will accomplish and form the basis of the performance criteria that will be used to measure the effectiveness of alternatives throughout the project. The alternative that best responds to these stated goals and objectives will be the plan that is recommended to be carried forward for implementation.

9.4 PLANNING INFLUENCES

9.4.1 Existing Conditions

Existing conditions within the Rainbow Valley study area are described in detail in Section 2. A composite map showing the major existing utilities, drainage facilities, major land holdings, and flooding locations is provided in Figure 9-3. Existing features that will influence the planning process are described in this section. The Rainbow Valley study area is generally undeveloped with relatively minor existing infrastructure. The major land holdings are interspersed throughout the study area, but are concentrated in the northern portion of the study area along Waterman Wash and along SR 238 near the community of Mobile.

The area with the most extensive infrastructure is Estrella Mountain Ranch in the northern portion of the study area. This area is partially developed and includes the vital infrastructure required to support the development's population, including roads, water/wastewater facilities,

electrical and natural gas utilities, and flood control structures. The area's drainage infrastructure is either in place or has been designed in compliance with Goodyear's design guidelines. As such, this area will require minimal drainage planning.

The bulk of major infrastructure in the area consists of overhead transmission lines. Because they are above ground, those transmission lines may have a low to moderate influence on where flood control facilities are sited. Flood control facilities such as channels and storm drains can cross overhead transmission lines with little complication so long as they do not interfere with the transmission towers. The study area is bisected by active high-pressure gas lines that run below ground. Relocating high-pressure gas lines can be cumbersome at channel crossings or storm drains and would affect where flood control facilities and basins can be sited.

The UPRR is a raised feature that crosses the study area and obstructs runoff, concentrating it in planned crossing locations such as Waterman Wash. The raised embankment was not designed to withstand flooding, so portions of the embankment may potential fail during a flood event, resulting in an unquantified risk to downstream property. Recent attention has been focused on this type of raised embankment by FEMA as part of the flood hazard mapping program. Current practice is to map the flood hazards associated with raised embankments under two scenarios and to map the worst case from both conditions. The first mapping condition is with the embankment in place, functioning similar to a dam or levee. The second mapping condition assumes that the embankment is not there, which is a simplified approach to considering a failure scenario. It would be desirable to address this potential hazard as part of the plan.

The major landholders in the study area may influence where flood control facilities can be located and the type of flood control facility that can be selected as regards structure type and method. Collaboration with developers will allow drainage improvements to conform to the character and location of the planned development, maximizing their effectiveness while making optimal use of the developable land.

9.4.2 Hydrology

The hydrology of the study area is described in Section 4. The area's flow magnitude and flow characteristics will have a major influence on the proposed drainage master plan and are depicted in Figure 9-4. The predominant flow characteristics of the study area are piedmont distributary and sheet flooding. The flow magnitude of the watercourses ranges from less than 500 cubic feet per second (cfs) to over 20,000 cfs along Waterman Wash. The characteristics and magnitude of flow will influence the location and type of flood control facilities that will be required for flood protection.

The flood control facilities will have to be situated and sized so there are no adverse impacts on the hydrology in the study area. The choice of location and type may be more flexible for flood control facilities required to contain the lower flow magnitudes (less than 500 cfs through 2,000 cfs). Alignments and profiles may be altered for these watercourses. However, the location and type of flood control facility for higher flow magnitudes (greater than 2,000 cfs) will be more complex.

Flow characteristics may dictate the type of flood control facility that is implemented in the study area. Certain flood control facilities are impractical for certain characteristics (e.g., basins are not practical in mountain slopes). Flow velocity associated with the characteristics and magnitude will also affect the type of flood control structures that can be implemented and the methods that can be applied to them. A concurrent evaluation of both flow characteristics and flow magnitude will be used to determine the most practical solution for the drainage master plan.

9.4.3 Environmental

Cultural Resources Constraints and Opportunities

Maricopa County's policy is to promote the appreciation and preservation of significant archaeological resources within the framework of state and federal laws.

A cultural resource that warrants preservation in place or would require costly studies to recover and preserve archaeological information would represent a constraint if it would be disturbed by construction of a flood protection facility. It might even represent a "fatal flaw" that would prevent implementation of a particular component of the Rainbow Valley ADMP.

Alternatively, if a historical building or structure or archaeological site that had public interpretation potential were to be located within the right-of-way or easement of a flood protection facility but could be avoided by construction activities, it could represent an opportunity to preserve a resource and possibly develop it for public interpretation in conjunction with recreational uses of the facility.

Determining whether significant cultural resources represent constraints or opportunities depends on the design details of each component of the Rainbow Valley ADMP. Those details will not be developed until later stages of planning. This assessment has therefore focused on using the available data to generally characterize the types and distribution of cultural resources in the study area and on identifying selected resources that represent the best opportunities for public interpretation of cultural resources in conjunction with developing outdoor recreational

opportunities at the flood protection facilities. Those high-sensitivity cultural resources are listed in Table 5-4 and shown on Figure 9-5.

Biological Constraints and Opportunities

Special Status Species and Species of Concern

Crested forms of the saguaro are listed as highly safeguarded by the Arizona Department of Agriculture. Also, the saguaro is a crucial resource for shelter and food of numerous wildlife species and one of a few food sources for the endangered lesser long-nosed bat (*Leptonycteris yerbabuenae*); therefore, all saguaros in the study area should be avoided wherever possible.

The Gila River provides useable habitat (vegetation and open water) for up to 17 special status species or species of concern, and the channel and vegetation should remain unmodified and in a natural state (Figure 9-5). Furthermore, an opportunity exists to return some water to the Gila River, which could help to control salt cedar, improve habitats in riparian communities, and help improve conditions in an historic wildlife corridor along the river.

Nonstructural solutions should be applied in the southeastern quarter of the study area to preserve habitats for the western narrow-mouthed toad (*Gastrophryne olivacea*) and the lowland burrowing treefrog (*Pternohyla fodiens*) (Figure 9-5).

Montane areas contain foraging habitat for the lesser long-nosed bat, roosting habitat for six other bats species of concern, and salvage-restricted plant species and should remain unmodified (Figure 9-5).

The Arizona chuckwalla (*Sauromalus ater*), Gila monster, red-backed whiptail (*Aspidoscelis burti xanthonotus*), Mexican rosy boa (*Charina trivirgata trivirgata*), and desert tortoise (*Gopherus agassizii*) are mainly associated with rugged terrain in mountains, foothills, upper bajadas, and higher-elevation washes. These species utilize lower washes to varying degrees as migratory corridors to maintain long-term population dynamics. Protection methods in mountains and upper bajadas should employ methods that do not create dispersal barriers along potential migratory routes. The importance of washes for these and other species make it important to retain native vegetation in washes. Waterman Wash and its larger tributaries have particularly important segments of natural xeroriparian vegetation that should be undisturbed (Figure 9-5).

Western burrowing owls (*Athene cunicularia hypugaea*) are most common in agricultural areas but are also found in desert scrub with fine-textured soils and in desert washes. Agricultural areas

should be considered as priority areas for preservation or maintenance of open space (Figure 9-5).

Wildlife and Habitats

Existing surface water in impoundments, in agricultural areas, or along the Gila River provide important habitat and resources for many wildlife species. These places may be even more important because these periodically attract rare or migrant bird species in the region. Opportunities to collect surface water in storage basins may improve habitats for wildlife in the study area.

Much of the study area still retains its indigenous vegetation, native character, and resident fauna. Preserving areas with native plants can help protect against floods and preserve native ecosystems.

A high priority should be assigned to the preservation of desert washes and associated native vegetation because of the high species diversity, the ameliorative effects of the plants on the local microclimate, and the importance of these areas as movement corridors and refugia for wildlife. Of particular importance is maintaining the natural channel and vegetation along Waterman Wash and its larger tributaries (Figure 9-5). An opportunity exists to restore vegetation along degraded portions of these washes, which can help to stabilize its banks.

Other high-biodiversity areas with upland desertscrub habitats and agricultural areas should have flood control methods that maintain the native character of the vegetation and connectivity for local populations of terrestrial wildlife (Figure 9-5).

Lowland desertscrub communities, particularly saltbush desertscrub communities, are becoming increasingly threatened because of widespread development in valleys and lowlands. Flood control methods that maintain connectivity of populations and habitats should receive priority in these natural areas. Nonstructural flood control methods would be best for wildlife and habitats in these areas.

Flood control measures in wildlife corridors should employ nonstructural methods; however, an opportunity exists to improve these corridors with the application of small storage basins. Other methods of improving corridors would be the BLM acquiring private and state land to create larger, more contiguous blocks of land in corridor areas. Also, the use of wildlife underpasses in corridor areas can provide dispersal opportunities under roadways or other manmade features. These wildlife-sensitive structures could be incorporated as part of the flood control structures.

9.4.4 Planned Land Use

Planned future land uses within the study area present opportunities for collaboration of multiple use benefits to the community. Planned land uses include uses identified in municipal land use plans, developer master-planned communities, as well as regional plans relating to transportation and utilities. Identified future land uses are shown on Figure 9-6 and are summarized in this section.

City of Avondale

The Estrella Foothills south of the Gila River are unique for this study because they do not drain to Waterman Wash. Opportunities for specific flood control projects will probably be planned by developers. No specific projects have been identified at this time, but may evolve as the Rainbow Valley ADMP progresses in the alternatives analysis.

The vision of the City of Avondale is to seek opportunities that provide open space, trails, alternative transportation, and other appropriate land uses that complement the Estrella Foothills area while maintaining the character and integrity of the present environment (Avondale 2008). The *Estrella Foothills Specific Plan* seems to meet the multipurpose and compatibility goals of the Rainbow Valley study. Collaboration with the City of Avondale helps assure that their goals will be met. Partnering with other Rainbow Valley stakeholders will allow for potential regional opportunities and linkages between the Estrella Mountain Regional Park and areas to the west.

The southern portion of the City of Avondale includes large areas dedicated to open space and recreation. The city limits from Pecos Road north to the Estrella Mountain Regional Park have both residential and retail development. Existing drainage in this area comes from the Estrella Mountains and flows through the developable areas. The planned development areas are flat with drainage patterns predominated by sheet flow. The flows will need to be concentrated and conveyed to Waterman Wash to provide future developments with flood hazard protection. The planned collaboration with the City of Avondale will facilitate the implementation of a “backbone” drainage improvement. Again, the City of Avondale’s vision is to require multi-purpose planning that maintains the character of the environment.

Town of Buckeye

Most of the Town of Buckeye in the Rainbow Valley study area is planned for open space uses, which can provide opportunities for connectivity and trail linkages to Waterman Wash and other existing and proposed open space areas to the east. A small pocket of low-density residential development, which includes a portion of the Rainbow Ranch master-planned community, is in an area characterized by disturbed land use that is adjacent to lower Waterman Wash. Flow

through the area is from the northern portion of the Maricopa Mountains. Further study is needed to determine whether this area will require flood hazard protection from a regional project or if the developer will be able to provide adequate protection. The area is expected to be developed to be compatible and to complement adjacent land uses such as open space, mountain, and riverine environments.

City of Goodyear

In the *Conceptual Corridor Study for Waterman Wash* (2008), RBF Consulting provides the direction for development along Waterman Wash. The study provides specific guidelines to developers for planning and designing projects that are bisected by or adjacent to the wash. The guidelines basically meet the goals and objectives of the Rainbow Valley ADMP, so this study does not specifically address projects in the floodway and floodplain fringe. Instead, efforts have been concentrated on potential projects that will provide regional “backbone” flood control to convey flows to Waterman Wash. Some of these projects will coincide with development along Waterman Wash and will outfall into Waterman Wash, which will influence the alternatives.

South of the Gila River, Goodyear is separated into two areas of development with open space (one dwelling unit per acre in an area between land that is either controlled by the BLM or ASLD). The *Sonoran Valley Planning Area Amendment* provides the direction for the City of Goodyear south of Patterson Road. There are two large and several smaller master-planned communities in the planning area.

North of Patterson Road, which is included in the *Goodyear General Plan 2003-2013*, there are a number of master-planned communities, with Estrella Region I accounting for the much of the developed property.

Many of the large master-planned communities in Goodyear are found in the north (Estrella Region I and III) and south (Amaranth and Cimarron), so coordination with the developers and the City of Goodyear is important in the selection of effective and efficient flood control corridors. The flood control structure types and methods should complement the adjacent planned-community objectives while maintaining the character ascribed by the Rainbow Valley land and resources context and compatibility assessment. In the end, providing flood hazard protection and safety is the goal of the District, the City of Goodyear, and the developer.

The City of Goodyear requires as policy the achievement of developing open space as an amenity for the area. In doing so it supports:

- Integration of Parks, Trails and Open Space
- Coordination with BLM to Access Land for Passive and Active Recreational Opportunities
- Strategic Location of Detention Basins to Enhance Visual and Functional Quality of the Built Environment
- Utilization of Proposed Regional Drainage Corridors
- Protection of the Riparian Habitat System along the Gila River

Collaboration with the City of Goodyear during the alternatives phase of the Rainbow Valley study should maximize these opportunities.

The City of Goodyear requires developments to retain the volume from the 100-year, six-hour storm. This criterion is more stringent than in other parts of Maricopa County. Discharges from development to proposed alternative flood control projects are therefore lower per acre than in other jurisdictions in the Rainbow Valley study area.

A number of existing and proposed transportation corridors will traverse the City of Goodyear in the Rainbow Valley study area. These include the portions of the Hassayampa Freeway, Loop 303 Extension, Sonoran Valley Parkway, City of Goodyear Enhanced Transit Corridor (MAG 2009) and other freeways, parkways and arterial roads identified in the City of Goodyear Land Use Plan Map (City of Goodyear 2008). These roadways and transportation corridors can either provide the opportunity for adjacent drainage corridors or block natural and proposed flow paths. The Rainbow Valley ADMP team is aware of these issues and will work with agency stakeholders to facilitate multiuse opportunities and partnering.

Sonoran Desert National Monument

The Sonoran Desert National Monument is mainly on federal land managed by the BLM. Some development is on private inholdings within its boundaries, but those properties are not being considered for protection from flood hazards. The national monument is designated as open space. Flood control alternatives may be considered within the national monument, but these would only be brought forward if public safety were an issue, and the alternative would need to be compatible with the land and resource context of the area. The BLM, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and AGFD are project stakeholders and will be included in early discussions on the potential use of the national monument for flood control.

Proposed Wildlife Corridors

AGFD has identified a number of wildlife corridors in the Rainbow Valley study area, the most significant being located in the vicinity of Township 3 South and Range 1 West. That corridor provides connectivity for wildlife movement between the Sierra Estrella and the Sonoran Desert National Monument. This large main corridor divides the northern and southern development areas of Rainbow Valley within the City of Goodyear's administrative boundaries. Flood control projects in the wildlife corridors should consider impacts on wildlife movement and opportunities to maintain the area's natural character and habitat. Flood control projects proposed in disturbed areas within the corridor should consider enhancement or restoration that would be compatible with adjacent habitats.

Estrella Mountain Regional Park and Sierra Estrella Wilderness

No flood control projects are expected to be identified in these areas. The regional park is on land owned and administered by Maricopa County, and the wilderness area is on federal land managed by the BLM.

9.4.5 Scenery and Open Space

The District's policy on the integration of landscaping and aesthetic treatment of flood control projects is based on its goal to preserve the visual beauty and other aesthetic qualities of the urban, rural, and natural settings in Maricopa County as an integral part of the planning and design of flood control facilities (e.g., context-sensitive planning, design, and implementation).

The future landscape character units described in Section 6.2 form the basis for identifying the opportunities and constraints associated with scenery resources and are shown in Figure 9-7. The following is a summary of constraints and opportunities identified during the data collection phase for scenery resources for the Rainbow Valley study area to assist the District in identifying planning flood control alternatives to achieve its overall goal.

Constraints:

- Recommend the use of nonstructural solutions as the preferred flood protection method and structure type for existing natural washes and riparian areas. This is further described in the compatibility mapping discussion in Section 9.6.
- Plan flood control projects in a way that preserves views to and from the surrounding mountain ranges.

- Plan flood protection facilities to be sensitive to the context of the future cultural setting and visual character of the region rather than its existing environment, applying the landscape design themes described in this section as well as the compatibility mapping in Section 9.6.
- Develop a united character for the length of the Waterman Wash within the city limits that is consistent with Goodyear's *Conceptual Corridor Study for Waterman Wash*.

Opportunities:

- Create multiuse corridors for the Waterman Wash consistent with Goodyear's *Conceptual Corridor Study for Waterman Wash* and the District's multiuse goals.
- Improve disturbed or poorly defined washes by using flood protection projects.
- Mitigate viewscape impacts caused by future development when planning flood protection methods. Viewscape analysis, though not a part of the data collection effort for this project, is discussed later in this section.
- Incorporate the urban plaza landscape design theme into flood control structures within urban areas.

Landscape Design Themes

The District's *Landscape Design Themes Handbook* identifies 10 landscape design themes for possible application in flood control solutions within the Sonoran Desert landscape character type in Maricopa County based on the physical and visual characteristics of the landscape units found within that character type. Each of the following 10 themes may apply to flood control solutions in the study area, depending on which landscape character units are identified:

1. Natural Sonoran Desert Uplands
2. Natural Sonoran Desert Uplands Riparian
3. Natural Lower Sonoran Desert
4. Natural Lower Sonoran Desert Riparian
5. Natural Sonoran Desert Hydroriparian
6. SeminatURAL Sonoran Desert
7. Enhanced Desert

8. Desert Oasis
9. Desert Park
10. Desert Plaza

The first five themes apply to natural, rural, and industrial settings. The next four themes apply primarily to suburban and urban desert settings, and the last theme usually applies only to urban settings.

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 LIA. The following three applicability ratings are used:

- **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 contextual sensitivity with the visual character of the landscape character unit. Occasionally applicable themes may be used in combination with an applicable landscape theme, but this should be limited to a maximum of 25 percent of the area for which the themes are occasionally applicable.
- **Not Applicable:** The theme is not applicable because it is not contextually sensitive with the visual character of the landscape character unit.

Table 9-2 provides the landscape design theme's applicability ratings for the future landscape character units in the study area. The applicability ratings in the table were assigned based on the ability of the themes to achieve contextual sensitivity with the landscape character units. The applicability ratings for the natural landscape character units were primarily based on the characteristics of the physical settings component. The applicability ratings for the remaining landscape character units were mainly based on the characteristics of the cultural settings component.

Table 9-2 Landscape Design Themes

Landscape Character Units	Landscape Design Themes									
	1 Natural Sonoran Desert Upland	2 Natural Sonoran Desert Upland Riparian	3 Natural Lower Sonoran Desert	4 Natural Lower Sonoran Desert Riparian	5 Natural Sonoran Desert Hydro-riparian	6 Semi-natural Sonoran Desert	7 Enhanced Desert	8 Desert Oasis	9 Desert Park	10 Desert Plaza
River Channels										
Natural River Channel	N/A	N/A	N/A	A	A	A	N/A	N/A	N/A	N/A
Rural River Channel	N/A	N/A	N/A	A	A	A	N/A	N/A	N/A	N/A
Suburban River Channel	N/A	N/A	N/A	A	A	A	A	A	A	OA
Urban River Channel	N/A	N/A	N/A	A	A	A	A	A	A	A
River Terraces										
Natural River Terrace	N/A	N/A	N/A	A	A	A	N/A	N/A	N/A	N/A
Rural River Terrace	N/A	N/A	N/A	A	A	A	N/A	N/A	N/A	N/A
Suburban River Terrace	N/A	N/A	N/A	A	A	A	A	A	A	OA
Urban River Terrace	N/A	N/A	N/A	A	A	A	A	A	A	A
Industrial River Terrace	N/A	N/A	N/A	A	A	A	A	A	A	N/A
Valley Plains										
Natural Valley Plains	N/A	N/A	A	A	A	A	N/A	N/A	N/A	N/A
Rural Valley Plains	N/A	N/A	A	A	A	A	N/A	N/A	N/A	N/A
Suburban Valley Plains	N/A	N/A	A	A	A	A	A	A	A	OA
Urban Valley Plains	N/A	N/A	A	A	A	A	A	A	A	A
Industrial Valley Plains	N/A	N/A	A	A	A	A	A	A	A	N/A
Valley Washes										
Natural Valley Wash	N/A	N/A	N/A	A	A	A	N/A	N/A	N/A	N/A
Rural Valley Wash	N/A	N/A	N/A	A	A	A	N/A	N/A	N/A	N/A
Suburban Valley Wash	N/A	N/A	N/A	A	A	A	A	A	A	OA
Urban Valley Wash	N/A	N/A	N/A	A	A	A	A	A	A	A
Industrial Valley Wash	N/A	N/A	N/A	A	A	A	A	A	A	N/A
Arroyos										
Natural Arroyo	N/A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Rural Arroyo	N/A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Suburban Arroyo	N/A	A	N/A	N/A	A	A	A	A	A	OA
Urban Arroyo	N/A	A	N/A	N/A	A	A	A	A	A	A
Upper Bajadas										
Natural Upper Bajada	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Rural Upper Bajada	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Suburban Upper Bajada	A	A	N/A	N/A	A	A	A	A	A	N/A
Urban Upper Bajada	A	A	N/A	N/A	A	A	A	A	A	A
Industrial Upper Bajada	A	A	N/A	N/A	A	A	A	A	A	N/A
Lower Bajadas										
Natural Lower Bajada	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Rural Lower Bajada	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Suburban Lower Bajada	A	A	N/A	N/A	A	A	A	A	A	OA
Urban Lower Bajada	A	A	N/A	N/A	A	A	A	A	A	A
Industrial Lower Bajada	A	A	N/A	N/A	A	A	A	A	A	N/A

Landscape Character Units	Landscape Design Themes									
	1 Natural Sonoran Desert Upland	2 Natural Sonoran Desert Upland Riparian	3 Natural Lower Sonoran Desert	4 Natural Lower Sonoran Desert Riparian	5 Natural Sonoran Desert Hydro-riparian	6 Semi-natural Sonoran Desert	7 Enhanced Desert	8 Desert Oasis	9 Desert Park	10 Desert Plaza
<i>Foothills</i>										
Natural Foothills	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Rural Foothills	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Suburban Foothills	A	A	N/A	N/A	A	A	A	A	A	OA
Urban Foothills	A	A	N/A	N/A	A	A	A	A	A	A
Industrial Foothills	A	A	N/A	N/A	A	A	A	A	A	N/A
<i>Mountains</i>										
Natural Mountains	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Rural Mountains	A	A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Suburban Mountains	A	A	N/A	N/A	A	A	A	A	A	OA
Urban Mountains	A	A	N/A	N/A	A	A	A	A	A	A
Industrial Mountains	A	A	N/A	N/A	A	A	A	A	A	N/A

NOTES: A = applicable, N/A = not applicable, OA = occasionally applicable

Viewsheds

While a formal viewshed analysis was not conducted as part of the data collection for the Rainbow Valley ADMP, general rules regarding the preservation and enhancement of common scenery resources may be applied in the study area based on observations made during multiple site visits. These include the recognition that mountain lands, such as the Sierra Estrella, the Maricopa Mountains, and their associated foothills provide some of the most significant focal views within a region. Views of the mountains should be preserved where possible, including the preservation or establishment of open space corridors that focus views toward the mountains, especially where development is predicted to occur. Additionally, any discordant features that would detract from the view should be screened. Views looking down into wash corridors from mountain and valley lands should also be preserved or enhanced because vegetated washes occur infrequently in the Sonoran Desert and have recognized scenic value.

Other observed views with high scenic value include those from the mountain recreation areas looking down into the valley. Flood control projects located in the valley lands should take these views into account and be developed to either preserve the natural character of the existing views or to contribute to the formation of a cohesive scene in areas where the natural landscape has been modified by development.

As further planning and design of flood control facilities occur within the study area, care should be taken to identify discordant features in the landscape that can be improved, and distinctive natural and cultural landscape features that should be protected, through the implementation of these facilities.

9.4.6 Parks and Recreation Resources

The District's goal for recreation is to promote multiple recreational uses of its properties through partnerships with the Maricopa County Parks and Recreation Department, local communities, and other stakeholders 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 properties.

The following is a summary of constraints and opportunities identified during the data collection phase for parks and recreation resources, shown on Figure 9-8, for the Rainbow Valley study area.

Constraints:

- Limit implementation of suburban parks or other developed types of recreation in natural wash or riparian areas.

Opportunities:

- Integrate planning and design of municipal and privately developed parks into flood protection planning.
- Integrate flood protection planning for the confluence of the Gila River and Waterman Wash with a regionally significant recreation area.

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.

The following is a summary of constraints and opportunities identified during the data collection phase for open space resources, as shown on Figure 9-9, for the Rainbow Valley study area.

Constraints:

- Preserve the natural and beneficial functions of existing floodplains in all cultural settings.
- Planning of open space uses and linkage connectivity should consider the future management or land use changes (i.e., sale of public lands or use rights).
- Be aware that property owners at the confluence of the Gila River and Waterman Wash are not currently involved in the ADMP process.

Opportunities:

- Implement local, county, and agency open space goals with flood protection planning.
- Integrate goals for environmental resource preservation and enhancement with open space planning.
- Integrate goals for culturally significant areas such as the Juan Bautista Historic Trail with open space objectives.
- Link east-west secured open spaces and drainages with Waterman Wash.
- Integrate flood protection planning for the confluence of the Gila River and Waterman Wash with a regionally significant open space area.

9.4.7 Stakeholders

To date, most concerns and issues have been expressed by agencies. These issues will influence elements identified in plan alternatives. Further influences will be identified by the public when public meetings are held and comments are received. Stakeholder influences are described below by issue or condition corresponding with data collected as part of this report.

Flood Control and Drainage

Many stakeholders would like to consider and preserve Waterman Wash and maintain washes in their existing condition. Floodplain hazards should be identified, and bridges and low-water crossings should be used where applicable. Any facilities should comply with Section 404 permitting regulations.

Parks, Recreation, and Open Space

This issue was of great interest and concern to both agency and private stakeholders. Private stakeholders are integrating trail and open space plans into their developments and are looking to maintain connectivity. Connectivity between trails and parks was also important to agency stakeholders. Multiuse opportunities were emphasized. Some stakeholders noted that OHV use should be allowed, while others noted concern with increasing OHV access to adjacent areas including Estrella Mountain Regional Park and BLM land.

Land Use

Consideration of existing and future land uses was emphasized, and stakeholders mentioned several specific plans that should be reviewed for consistency. It was also noted that future developments and transportation plans could change the future land use character of the area. It

was emphasized that the project team should work with developers during the study to understand their future plans. Some people expressed concern that there is pressure to change the washes to increase the amount of developable land.

Utilities

Stakeholders noted that a utility corridor currently bisects Rainbow Valley. Arizona Public Service is considering a transmission line through Rainbow Valley. Because the Transwestern pipeline soon will be constructed, it can be considered an existing rather than a future utility.

Biological Resources

Biological resources were mentioned by many stakeholders, particularly maintaining habitat connectivity, wash habitat for species, and migration corridors (i.e., between Estrella Mountain Regional Park and other areas) for species such as the bighorn sheep. It was noted that wildlife use Waterman Wash.

Other Environmental Issues

Other environmental issues mentioned included maintaining scenic views, considering air quality issues (associated with unpaved roads or OHV use) and determining if subsidence in the area was an issue.

Transportation

Because there is much anticipated growth in the area, there also are a number of anticipated transportation plans. Several specific transportation studies and corridors were mentioned for consideration by the stakeholders. It was also noted that connectivity is important, and existing roads should be considered in the planning efforts.

Planning Process and Implementation

Some stakeholders provided input on the approach for the study, noting that an appropriate and consistent approach should be developed and implemented. It was also noted that the timing and the context of the study is important, as the character of the area is changing due to planned development. It was emphasized that it will be important to develop project partners, and that the plan should be useable, easy to understand, and meaningful to both planners and engineers.

9.5 FLOOD PROTECTION COMPATIBILITY

The development of context-sensitive flood mitigation solutions that protect and enhance the cultural, biological, scenic, recreation, and open space resource environments of Maricopa County are important goals that are an integral part of carrying out the District's overall mission.

9.5.1 Introduction

Context sensitivity refers to the relative ability of the different structure types and flood protection methods that are frequently evaluated and recommended by the District to complement the valued characteristics of the landscape settings, as well as the cultural, biological, recreational, and open space environments in which they are placed. This ability is influenced by the visual characteristics, scale, and magnitude of landscape modification typically associated with each structure type and flood protection method. Methods that preserve or mimic the dominant characteristics and functions of these resources within a given landscape setting are more likely to be seen as being context sensitive and a valued part of those settings.

Structure Type Compatibility

Six flood control structure types are frequently considered, evaluated, and recommended in the District's area drainage and watercourse master planning studies, project pre-designs, and final designs. Those structure types are as follows:

- Nonstructural
- Underground Pipes
- Channels-Levees
- Conveyance Channels
- Storage Basins
- Flood-Retarding Structures or Dams

These structure types vary in their physical and visual characteristics and their ability to complement the variety of settings and resource environments found in Maricopa County. The physical dimension, or "scale," of the structure types relative to the size of the features in the surrounding landscape setting also influences the perceived ability of flood control structures to achieve context sensitivity with the environments in which they are placed. The size and depth of large flood control structures can result in significant impact areas that affect existing resources such as cultural and biological features and can appear to be visually overwhelming and out of context with landscape settings comprised of small scale features. For this reason, the levee,

conveyance channel, storage basin and flood-retarding structure types are further stratified into the following three structure-type subclasses according to scale:

- Small Structures
- Medium Structures
- Large Structures

Table 9-3 describes the relative size of each structure type with its associated scale subclasses.

Table 9-3 Flood Protection Structure Scale Subclasses and Physical Dimensions

Structure Type	Scale Subtype	Physical Dimension
Nonstructural	N/A	N/A
Underground Pipe	N/A	N/A
Channel-Levee	Small	Up to 6 ft high and up to 25 ft wide
	Medium	Six to 10 ft high and 25 to 100 ft wide
	Large	More than 10 ft high and more than 100 ft wide
Conveyance Channel	Small	Up to 5 ft deep and up to 25 ft wide
	Medium	Five to 8 ft deep and 25 to 100 ft wide
	Large	More than 8 ft deep and more than 100 ft wide
Storage Basin	Small	Up to 8 ft deep and 5 acres in area
	Medium	Up to 8 ft deep (60 percent), up to 15 ft deep (40 percent) and 5 to 20 acres in area
	Large	More than 15 ft deep and more than 20 acres in area
Dam	Small	Up to 10 ft high and up to 1 mile long (total)
	Medium	Ten to 15 ft high and 1 to 2 miles long (total)
	Large	More than 15 ft high and more than 2 miles long (total)

NOTES: ft = foot/feet, N/A = not applicable

A brief description of each of these structure types, scale subtypes, and photographic examples have been included in Appendix C. Each structure type has been evaluated according to its overall potential to modify and achieve context sensitivity with the cultural, biological, scenic, parks and recreation, and open spaces resources within the Rainbow Valley study area. Compatibility classes and mapping slightly differ for each resource; the compatibility classes for each resource are described below.

Flood Protection Methods Compatibility

The District routinely evaluates and implements a variety of nonstructural and structural methods for providing flood protection in area drainage and watercourse master planning, project predesign, and final design. Listed below are six of the methods most commonly applied by the District:

- Nonstructural Method
- Soft Structural Method
- Semisoft Structural Method
- Hard Structural Method with Aesthetic Treatment
- Semihard Structural Method
- Hard Structural Method

These flood protection methods vary in their physical and visual characteristics and their relative ability to complement or enhance the valued character of the resources and landscape settings found in Maricopa County. The above flood protection methods are arrayed as a spectrum in Table 9-4 according to their potential for achieving context sensitivity with these resources.

Table 9-4 Flood Protection Methods and Context Sensitivity

Flood Protection Methods	Level of Landscape Modification	Effect on Landscape Character	Potential for Context Sensitivity
Nonstructural	Not Present	Preserved	Highest  Lowest
Soft Structural	Not Evident	Retained	
Semisoft	Slightly Evident	Partially Retained	
Enhanced Hard Structural	Evident	Modified	
Semihard	Strongly Evident (Visually Dominant)	Strongly Modified	
Hard Structural	Very Strongly Evident (Drastic Modification)	Drastically Modified	

The identification and selection of flood protection methods that have the potential to complement the visual character of the landscape settings in which they will be constructed is therefore a key first step towards developing flood protection solutions that will be context sensitive with the surrounding environment and help meet the District's overall mission and goals.

The compatibility ratings for each resource were established based on comparison of each flood protection method with the features contained in the cultural, biological, scenic, recreational, and open space resource inventories described above. The ratings shown in Table 9-5 reflect typical District applications of the flood protection method. Incompatible ratings may, in some instances, be overcome through the application of special or extraordinary treatments and designs.

Table 9-5 Flood Protection Methods and Compatibility Classes

Flood Protection Methods	Context Sensitivity Potential	Compatibility Class
Nonstructural	Highest	1
Soft-Structural		2
Semisoft Structural		3
Enhanced Hard		4
Semihard Structural		5
Hard Structural		6
		Lowest

Next, the flood protection method compatibility ratings tables were modeled in GIS to produce a flood protection method compatibility map for each resource. Since the flood protection methods are arrayed as a spectrum according to their ability to complement and achieve context sensitivity with the resource settings in Maricopa County, each compatibility class shown on the maps for these resources defines a range of compatible flood protection methods. For example, all six of the flood protection methods are compatible in areas designated as Compatibility Class 6, all flood protection methods except for hard structural are compatible in areas designated as Compatibility Class 5, and so on. At the opposite end of the spectrum, only the nonstructural flood protection method is expected to be compatible in areas designated As Compatibility Class 1. A brief description of each flood protection method with photographic examples has been included in Appendix C.

The compatibility analyses presented in the following sections define the extent to which the flood protection structure types and methods are expected to be complementary to, and context sensitive with, the cultural, biological, scenic, recreational, and open space environments in the Rainbow Valley study area. Each section includes an analysis of the compatibility of the structure types and flood protection methods typically recommended by the District with the character and function identified for each of these resources. This analysis was used to create the various compatibility rating tables and compatibility class mapping for each of these resources, as described below.

9.5.2 Flood Hazards

The compatibility of the above-described flood protection structure types and methods with respect to the cultural, biological, scenic, recreational, and open space environments is predicated on the ability of the structure type and method to effectively address the flood control function for which it is intended. As a result, an important step in the compatibility analysis is to identify the effectiveness of the structure types and methods to control flooding when applied within each

combination of cultural setting and landform flow characteristic as described in Section 9.2.3. The intent is that only effective flood protection types and methods will be considered in the subsequent compatibility analysis. Table 9-6 assigns the effectiveness designation of E for “effective” and I for “ineffective” for the application of each flood protection type in each flow characteristic landform area. The effectiveness rating is the same for each cultural setting subset.

Table 9-6 Flood Protection Structure Type Effectiveness

Flow Characteristic Landform Area	Structure Type					
	Non-structural	Under-ground Pipe	Channels-Levees	Conveyance Channels	Storage Basins	FRS or Dams
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
			S/M/L	S/M/L	S/M/L	S/M/L
Alluvial Fan	E	I	E	E	E	E
Sheet Flow/Disturbed	E	I	E	E	E	E
Mountain Slopes	E	I	I	I	I	I
Major Rivers and Tributaries	E	I	E	E	I	E
Stock Ponds	E	E	E	E	E	E
Piedmont Tributaries	E	E	E	E	E	E
Piedmont Distributary Flow	E	I	E	E	E	E

NOTES: E = effective, I = ineffective, S = small, M = medium, L = large, FRS = flood-retarding structure

Table 9-7 shows the effectiveness of the various flood protection methods when applied with each combination of flow characteristic landform and cultural setting. The derivation of Table 9-6 and Table 9-7 are provided in Appendix D.

Table 9-7 Flood Protection Method Effectiveness

Flow Characteristic Landform Area	Methods					
	Non-structural	Soft Structure	Semisoft Structure	Hard with Aesthetics	Semi-hard	Hard Structure
<i>Alluvial Fan</i>						
Natural	E	I	E	E	E	E
Rural	I	I	E	E	E	E
Suburban	I	I	I	E	E	E
Urban	I	I	I	E	E	E
Industrial	I	I	I	E	E	E
<i>Sheet Flow/Disturbed</i>						
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	I	E	E	E	E	E
Urban	I	E	E	E	E	E
Industrial	I	E	E	E	E	E

Flow Characteristic Landform Area	Methods					
	Non- structural	Soft Structure	Semisoft Structure	Hard with Aesthetics	Semi- hard	Hard Structure
<i>Mountain Slopes</i>						
Natural	E	I	I	E	I	E
Rural	E	I	I	E	I	E
Suburban	E	I	I	E	I	E
Urban	E	I	I	E	I	E
Industrial	E	I	I	E	I	E
<i>Major Rivers and Tributaries</i>						
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
<i>Stock Ponds</i>						
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
<i>Piedmont Tributaries</i>						
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E
<i>Piedmont Distributary Flow</i>						
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	I	I	E	E	E	E
Urban	I	I	E	E	E	E
Industrial	I	I	E	E	E	E

NOTES: E = effective, I = ineffective

9.5.3 Historic and Cultural Resources

Table 9-8 and Figure 9-10 summarize the results of the assessment of the compatibility of different flood protection methods with selected cultural resources. Nonstructural flood protection methods are evaluated as compatible with the Quartz Peak Trail. Nonstructural and soft structural methods are evaluated as compatible with the Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road. Those flood protection methods are also evaluated as compatible with the Hohokam village site/possible Waterman farmstead site and the Mobile African-American community, along with semisoft structural and enhanced hard structural methods. Semihard structural flood protection methods also are rated as compatible with the Mobile African-American community. All flood protection methods are rated as compatible with the Initial Point of the Gila and Salt River Baseline and Meridian. More

information about the compatibility analysis is provided in the cultural resource assessment report (URS 2009).

Table 9-8 Compatibility of Flood Protection Methods with Selected Cultural Resources

Cultural Resource Character Units	Flood Protection Methods						Compatibility Class
	Non-structural	Soft Structural	Semisoft Structural	Enhanced Hard Structural	Semihard Structural	Hard Structural	
Quartz Peak Trail AZ T:16:124(ASM) (Prehistoric and Historic)	C	IC	IC	IC	IC	IC	1
Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road AZ T:15:32(ASM)	C	C	IC	IC	IC	IC	2
Hohokam Village Site AZ T:10:46(ASM)/ Waterman Farmstead	C	C	C	C	IC	IC	4
Mobile (Historic African-American Community)	C	C	C	C	C	IC	5
Initial Point, Gila and Salt River Baseline and Meridian AZ T:11:102(ASM)	C	C	C	C	C	C	6

NOTES: C = compatible, IC = incompatible

Table 9-9 and Figure 9-11 summarize the results of the assessment of the compatibility of different flood protection structure types with selected cultural resources. Nonstructural facilities are rated as compatible with the Quartz Peak Trail. Nonstructural facilities, underground pipes, conveyance channels, and storage basins are evaluated as compatible with the Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road. All flood protection structure types are evaluated as compatible with the Hohokam village site/possible Waterman farmstead site, the Mobile African-American community, and the Initial Point of the Gila and Salt River Baseline and Meridian. More information about the compatibility analysis is provided in the cultural resource assessment report (URS 2009).

Table 9-9 Compatibility of Flood Protection Structure Types with Selected Cultural Resources

Cultural Resource Character Units	Flood Protection Structure Types														Compatibility Class
	Non-structural (Class 1)	Under-ground Pipe (Class 2)	Channel-Levee (Class 3)			Conveyance Channel (Class 4)			Storage Basin (Class 5)			Dam (Class 6)			
			S	M	L	S	M	L	S	M	L	S	M	L	
Quartz Peak Trail AZ T:16:124(ASM) (Prehistoric and Historic)	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	1
Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road AZ T:15:32(ASM)	C	C	IC	IC	IC	C	C	C	C	C	C	IC	IC	IC	4
Hohokam Village Site AZ T:10:46(ASM)/ Waterman Farmstead	C	C	C	C	C	C	C	C	C	C	C	C	C	C	6
Mobile (Historic African-American Community)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	6
Initial Point, Gila and Salt River Baseline and Meridian AZ T:11:102(ASM)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	6

NOTES: C = compatible, IC = incompatible, S = small, M = medium, L = large

Table 9-10 summarizes the results of an assessment of the compatibility of 10 landscape design themes that might be applied to flood protection facilities with the five selected high-sensitivity cultural resources. The overall goal would be to apply themes that are similar to the current settings of the resources.

Table 9-10 Compatibility of Landscape Design Themes with Selected Cultural Resources

Cultural Resource Character Units	Landscape Design Themes									
	1 Natural Sonoran Desert Upland	2 Natural Sonoran Desert Upland Riparian	3 Natural Lower Sonoran Desert	4 Natural Lower Sonoran Desert Riparian	5 Natural Sonoran Desert Hydro- riparian	6 Semi- natural Sonoran Desert	7 Enhanced Desert	8 Desert Park	9 Desert Oasis	10 Desert Plaza
Quartz Peak Trail AZ T:16:124(ASM) (Prehistoric and Historic)	C	C	IC	IC	IC	IC	IC	IC	IC	IC
Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road AZ T:15:32(ASM)	IC	IC	C	C	IC	C	IC	IC	IC	IC
Hohokam Village Site AZ T:10:46(ASM)/ Waterman Farmstead	IC	IC	C	C	C	C	C	IC	IC	IC
Mobile (Historic African-American Community)	IC	IC	C	C	IC	C	C	IC	IC	IC
Initial Point, Gila and Salt River Baseline and Meridian AZ T:11:102(ASM)	C	C	IC	IC	IC	C	C	IC	IC	IC

NOTES: C = compatible, IC = incompatible

Landscape design themes for flood protection facilities were rated as compatible with the five selected cultural resources if they maintain or replicate the existing settings of the resources. natural Sonoran Desert upland and natural Sonoran upland riparian themes are compatible with the Quartz Peak Trail. Natural lower Sonoran Desert and natural Sonoran Desert riparian themes, along with the seminatural Sonoran Desert theme, are compatible with the Juan Bautista de Anza National Historic Trail (Gila Trail)/Butterfield Overland Mail Road. Natural Sonoran Desert, natural Sonoran Desert riparian, and natural Sonoran Desert hydroriparian themes, along with the seminatural Sonoran Desert and enhanced desert themes, are compatible with the Hohokam village site/possible Waterman farmstead site. Those same themes, except for the natural Sonoran Desert hydroriparian theme, are compatible with the Mobile African-American community. Natural Sonoran Desert upland and natural Sonoran Desert upland riparian themes and seminatural Sonoran Desert and enhanced desert themes are considered to be compatible with the Initial Point of the Gila and Salt River Baseline and Meridian. More information about the compatibility analysis is provided in the cultural resource assessment (URS 2009).

It is estimated that there are approximately 1,000 to 1,500 archaeological and historical resources in the assessment area, more than 90 percent of which have yet to be discovered, recorded, and evaluated. Many of those resources are likely to be significant, primarily for their potential to yield important information. If such resources were within areas that would be disturbed by construction of flood protection facilities of the Rainbow Valley ADMP, those impacts could be mitigated through studies to recover and preserve artifacts and data, and are unlikely to represent major constraints of fatal flaws.

If sites are within rights-of-way or easements acquired for flood protection facilities but would not be disturbed, they would represent opportunities for preservation and possibly public interpretation. (Some sites are likely to have values that warrant preservation in place, and would represent greater constraints and perhaps fatal flaws.) Five resources that offer opportunities for preservation and possible interpretation were identified among the cultural resources inventoried within the assessment area. The District will continue to consider potential effects on those and other cultural resources, as well as the potential to preserve and publicly interpret cultural resources as development of the Rainbow Valley ADMP continues.

9.5.4 Biological Resources

Table 9-11 and Figure 9-12 summarize the results of the assessment of the compatibility of different flood protection methods with the appropriate major habitat types, landcover, plant communities, or special features. Methods limited to non-structural structures include riparian habitats, natural vegetation communities, wildlife corridors, and grassland types associated with the Vekol Valley area.

Numerous assumptions and criteria were followed in the compatibility analysis and were limited to factors that constrain the use of a particular flood protection structure or method. Assumptions and criteria are as follows:

1. Would the structure or flood protection method impede or stop the movement or dispersal of wildlife?
2. To what degree does the structure or flood protection method modify or degrade the habitat or vegetation of the biological resource?
3. The level of impact varies with the habitat or vegetation type in question, because some categories support less adaptable species than others (e.g., natural montane habitats in comparison to suburban areas).

4. Plant communities vary in the ability to effectively and successfully restore or remediate after construction. For example, creosotebush desertscrub is easy to restore with hydroseeding as compared to restoration of the mixed upland desertscrub community.
5. How does a structure affect the natural ecohydrologic regime? For example, would a storm drain with underground pipe remove water from a plant community for which this is an essential resource?
6. Dams are usually incompatible with respect to biological resources in natural habitats because the height, slope, and length typically form an impenetrable barrier to terrestrial wildlife movement. This impact is negligible for wildlife found in suburban, urban, and industrial areas.
7. Hard structural flood protection method were incompatible with biological resources in all cases.
8. Future land use was assessed as if those areas were developed according to the MAG planning data.
9. Large levees and channels typically are incompatible with biological resources in natural areas, because these form long and complex barriers to movement by wildlife. This impact is negligible for wildlife found in suburban, urban, and industrial areas.

The inherent constraints of biological resources did not adequately fall within the compatibility spectrum developed for the visual and recreational resources and structure types. The spectrum was unsuited for assessing impacts on floodway fringe, open water, rural upland desertscrub, natural saltbush, and natural creosotebush desertscrub categories. The compatibility class rankings therefore appear blank in Table 9-11.

Table 9-11 Structural Compatibility Results for Biological Resources

Habitat Types/Land Cover/Plant Community	Non-structural (Class 1)	Under-ground Pipe (Class 2)	Channel Levee (Class 3)			Conveyance Channel (Class 4)			Storage Basin (Class 5)			Dam (Class 6)			Compatibility Class ¹
			S	M	L	S	M	L	S	M	L	S	M	L	
Riparian Habitat (All Subcategories)	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	
Natural/Rural – Floodway Fringe	C	IC	C	C	IC	C	C	IC	IC	IC	IC	IC	IC	IC	
Suburban – Floodway Fringe	C	IC	C	C	IC	C	C	IC	C	C	IC	IC	IC	IC	
Urban/Industrial – Floodway Fringe	C	IC	C	C	C	C	C	C	C	C	C	IC	IC	IC	
Natural – Open Water	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	
Rural – Open Water	C	IC	IC	IC	IC	IC	IC	IC	C	C	C	IC	IC	IC	
Suburban – Open Water	C	IC	C	C	IC	C	C	IC	C	C	C	C	IC	IC	
Urban/Industrial – Open Water	C	IC	C	C	C	C	C	C	C	C	C	C	C	IC	
Natural – Mixed Upland Desertscrub	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	
Rural – Mixed Upland Desertscrub	C	IC	IC	IC	IC	IC	IC	IC	C	C	IC	IC	IC	IC	
Natural – Mountain Woodland	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	
Natural – Mixed Salt Desertscrub	C	C	IC	IC	IC	IC	IC	IC	C	C	IC	IC	IC	IC	
Rural – Mixed Salt Desertscrub	C	C	C	C	IC	C	C	IC	C	C	IC	IC	IC	IC	
Natural – Mixed Creosote Scrub	C	C	IC	IC	IC	IC	IC	IC	C	C	IC	IC	IC	IC	
Rural – Mixed Creosote Scrub	C	C	C	C	IC	C	C	IC	C	C	IC	IC	IC	IC	
Agriculture	C	C	C	C	IC	C	C	IC	C	C	C	C	IC	IC	
Suburban – Developed	C	C	C	C	IC	C	C	IC	C	C	C	C	IC	IC	
Urban – Developed	C	C	C	C	C	C	C	C	C	C	C	C	IC	IC	
Industrial – Developed	C	C	C	C	C	C	C	C	C	C	C	C	C	IC	
Vekol Valley (All Subcategories)	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	
Wildlife Corridor (All Subcategories)	C	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	IC	

NOTES: ¹ The compatibility spectrum was unsuited for assessing impacts on floodway fringe, open water, rural upland desertscrub, natural saltbush, and natural creosotebush desertscrub categories. The compatibility class rankings therefore appear blank.

C = compatible, IC = incompatible, S = small, M = medium, L = large

Table 9-12 and Figure 9-13 summarize the results of the compatibility analysis of structural methods with biological resources in the Rainbow Valley study area. Natural vegetation, riparian areas, wildlife corridors, and grassy habitats associated with Vekol Valley were the most restrictive areas. Suburban, urban, and industrial developments were the most permissive with respect to flood protection methods.

Table 9-12 Flood Protection Methods Compatibility Results for Biological Resources

Habitat Types/Land Cover/Plant Community	Non-structural (Class 1)	Soft Structural (Class 2)	Semisoft Structural (Class 3)	Enhanced Hard Structural (Class 4)	Semihard Structural (Class 5)	Hard Structural (Class 6)	Compatibility Class
Riparian Habitat (All Subcategories)	C	IC	IC	IC	IC	IC	1
Natural/Rural/Suburban/Urban – Floodway Fringe	C	C	IC	IC	IC	IC	2
Industrial – Floodway Fringe	C	C	C	IC	IC	IC	3
Natural/Rural – Open Water	C	IC	IC	IC	IC	IC	1
Suburban – Open Water	C	C	C	IC	IC	IC	3
Urban/Industrial – Open Water	C	C	C	C	C	IC	5
Natural – Mixed Upland Desertscrub	C	C	IC	IC	IC	IC	2
Rural – Mixed Upland Desertscrub	C	C	IC	IC	IC	IC	2
Natural – Mountain Woodland	C	IC	IC	IC	IC	IC	1
Natural – Mixed Salt Desertscrub	C	C	IC	IC	IC	IC	2
Rural – Mixed Salt Desertscrub	C	C	IC	IC	IC	IC	2
Natural – Mixed Creosote Scrub	C	C	IC	IC	IC	IC	2
Rural – Mixed Creosote Scrub	C	C	IC	IC	IC	IC	2
Agriculture	C	C	C	C	C	IC	5
Developed – Suburban	C	C	C	C	C	IC	5
Developed – Urban	C	C	C	C	C	IC	5
Developed – Industrial	C	C	C	C	C	IC	5

NOTES: C = compatible, IC = incompatible

9.5.5 Scenery Resources

Preservation of the natural landscapes of Maricopa County and protection of the character of the local community are primary objectives of the District’s approved policy for the landscaping and aesthetic treatment of flood control structures. The development of flood mitigation solutions that protect and enhance the visual character of the existing and future environments of Maricopa County also help to achieve the District’s overall mission.

Scenery Resources Structure Types Compatibility

Each of the structure types were evaluated at all scales for their compatibility with the scenery resources predicted for the Rainbow Valley study area and were rated as either compatible or incompatible based upon the visual character reflected by each of the landscape character units.

The six common structure types frequently evaluated and recommended in the flood protection planning process are listed in Table 9-13 and have been arrayed as a spectrum according to their potential to modify and achieve context sensitivity with the landscape settings commonly found

within Maricopa County. Within this spectrum, the nonstructural and underground pipe structure types have the highest potential for achieving context sensitivity with most landscape settings in Maricopa County. The levee and conveyance channel structure types generally have an intermediate potential, whereas the storage basin and flood-retarding structure types tend to have the lowest potential for achieving context sensitivity with most landscape settings in Maricopa County.

Table 9-13 Flood Protection Structure Types and their Potential to Achieve Context Sensitivity with Landscape Settings

Flood Protection Structure Types	Potential Magnitude of Landscape Alteration	Potential to Achieve Context Sensitivity
Nonstructural	Lowest	Highest
Underground Pipe		Highest
Channel-Levee		Highest
Conveyance Channel		Highest
Storage Basin		Highest
Flood-Retarding Structure or Dam		Lowest

This spectrum applies to the scenery, parks and recreation and open space resources structure types compatibility assessments. Structure type compatibility ratings were determined by comparing the visual character and degree of landscape modification that is typically associated with implementation of each structure type with the visual character and intended uses of the resource units identified in this report. The compatibility ratings and resulting compatibility classes are summarized in Table 9-14 and illustrated in Figure 9-14.

Since structural scale is largely a factor that influences human perception of context sensitivity with the character of the visual environment, structure-scale subclass ratings are provided only for the compatibility analysis of landscape character unit and structure type. There can be a variety of different combinations of structure- scale subclass ratings within each compatibility class. Each unique combination of structure-scale subclass ratings within each compatibility class is identified with a two-digit number. For example, landscape units identified as Compatibility Class 5.1 are expected to be compatible with the nonstructural, underground pipe, and small channel-levee, conveyance channel, and storage basin structure types, whereas landscape character units identified as Compatibility Class 5.2 are expected to be compatible with the nonstructural, underground pipe, medium channel-levee, small conveyance channel, and storage basin structure types. The first number identifies the structure type compatibility class;

the second number identifies the structure-scale subclass. As with the compatibility class numbers, the lower subclass numbers indicate a lower range of structure-scale compatibility. Scale subclasses with higher numbers indicate a higher range of structure-scale compatibility.

The structure type compatibility ratings in Table 9-14 were combined in GIS with the future landscape character units map coverages for Rainbow Valley study area to produce a compatibility map showing scenery resources structure types (Figure 9-14). The compatibility classes shown on Figure 9-14 indicate the range of flood protection structure types that are expected to be compatible, complementary, and context sensitive with various landscape settings in the Rainbow Valley study area. The distribution of the scenery resource structure types compatibility classes is indicated in Table 9-15.

Table 9-14 Compatibility Ratings of Scenery Resources Structure Types

Landscape Character Units	Non-structural (Class 1)	Under-ground Pipe (Class 2)	Channel- Levee (Class 3)	Channel (Class 4)	Storage Basin (Class 5)	Dam (Class 6)	Comp. Class
Natural River Channel	C	IC					1
Rural River Channel	C	IC					1
Suburban River Channel	C	IC					1
Urban River Channel	C	IC					1
Natural River Terrace	C	C	S	S	S		5.1
Rural River Terrace	C	C	S	S	S		5.1
Suburban River Terrace	C	C	S	S	S		5.1
Urban River Terrace	C	C	M	S	S		5.2
Industrial River Terrace	C	C	M	S	S		5.2
Natural Valley Plain	C	C	M	M	M	M	6.3
Rural Valley Plain	C	C	M	M	M	M	6.3
Suburban Valley Plain	C	C	M	M	M	M	6.3
Urban Valley Plain	C	C	M	L	M	L	6.4
Industrial Valley Plain	C	C	L	L	L	L	6.5
Natural Valley Wash	C	IC					1
Rural Valley Wash	C	IC					1
Suburban Valley Wash	C	IC					1
Urban Valley Wash	C	IC					1
Industrial Valley Wash	C	IC					1
Natural Arroyo	C	IC					1
Rural Arroyo	C	IC					1
Suburban Arroyo	C	IC					1
Urban Arroyo	C	IC					1
Industrial Arroyo	C	IC					1
Natural Upper Bajada	C	C	S	S	S	S	6.1
Rural Upper Bajada	C	C	S	S	S	S	6.1
Suburban Upper Bajada	C	C	S	S	S	S	6.1
Urban Upper Bajada	C	C	S	S	S	S	6.1
Industrial Upper Bajada	C	C	S	S	S	S	6.1
Natural Lower Bajada	C	C	S	M	S	M	6.2

Landscape Character Units	Non-structural (Class 1)	Under-ground Pipe (Class 2)	Channel- Levee (Class 3)	Channel (Class 4)	Storage Basin (Class 5)	Dam (Class 6)	Comp. Class
Rural Lower Bajada	C	C	S	M	S	M	6.2
Suburban Lower Bajada	C	C	S	M	S	M	6.2
Urban Lower Bajada	C	C	S	M	S	M	6.2
Industrial Lower Bajada	C	C	S	M	S	M	6.2
Natural Foothills	C	IC					1
Rural Foothills	C	IC					1
Suburban Foothills	C	C	S	S			4
Urban Foothills	C	C	S	S			4
Industrial Foothills	C	C	S	S			4
Natural Mountains	C	IC					1
Rural Mountains	C	IC					1
Suburban Mountains	C	IC					1
Urban Mountains	C	IC					1
Industrial Mountains	C	IC					1

NOTES: Comp. = compatibility

Compatibility Ratings

C = Structure is fully compatible with the landscape character unit.

IC = Structure type is incompatible with the landscape character unit.

Structure-Scale Subclasses

S = Small structures are compatible.

M = Small and medium-sized structures are compatible.

L = Small, medium, and large structures are compatible.

Table 9-15 Summary of Scenery Resources Structure Types Compatibility Classes

Compatibility Class and Subclass	Acres	Percentage (%) of Study Area
Class 1	63,514	19
Class 4	1,286	<1
Class 5.1	1,558	<1
Class 5.2	91	<1
Class 6.1	60,781	18
Class 6.2	55,712	17
Class 6.3	140,108	42
Class 6.4	4,676	1
Class 6.5	2,079	<1

NOTE: < = less than

Most of the Rainbow Valley study area (42 percent) is rated as Compatibility Class 6.3, or visually compatible with any underground pipes or medium-sized levees, channels, basins, or dams. These areas include the natural, rural, and suburban valley plains landscape units.

Approximately 19 percent of the project area is designated as Compatibility Class 1 and is context sensitive only with nonstructural methods. The mountain lands, such as the Sierra Estrella and Maricopa Mountains and the foothills associated with those mountain ranges, are given this designation due to their inherently high visual quality and the difficulty of complementing the visual character of these areas using structural methods.

Compatibility Class 4, which makes up less than 1 percent of the study area, consists primarily of the landscape character units within the suburban, urban, and industrial cultural settings. These areas are all north of the study area.

The remaining Compatibility Class 6 subclasses (Classes 6.4 and 6.5) are limited to the urban or industrial valley plains landscape character units and comprise slightly more than 1 percent of the Rainbow Valley ADMP study area.

The Compatibility Class 5 subclasses are all associated with the landscape character units within the river terrace physical setting along the Gila River. Comprising less than 1 percent of the study area, these areas are compatible with underground pipes and small levees in the natural, rural, and suburban river terrace landscape units, or medium levees in the urban or industrial river terrace landscape units. Medium-sized channels and basins are also compatible with the river terrace physical setting, regardless of the cultural setting.

Compatibility Class 6.1 areas (18 percent of the study area) are associated with the landscape character units within the upper bajada physical setting where the visual character of the upper bajada is deemed to be compatible with small structure types and nonstructural flood protection methods.

Compatibility Class 6.2 areas (17 percent of the study area) are associated with the landscape character units within the lower bajada physical setting where the visual character of the lower bajada is deemed to be compatible with nonstructural flood protection methods as well as small levees or basins and medium-sized channels and dams.

Scenery Resources Flood Protection Methods Compatibility

Each flood protection method was evaluated for compatibility with the future landscape character units predicted for the Rainbow Valley study area, and each method was rated as either compatible or incompatible based on the visual character of each unit. The compatibility ratings and resulting compatibility classes are summarized in Table 9-16 and illustrated in Figure 9-15.

Using GIS, this matrix was applied to the scenery resource assessment for the Rainbow Valley study area. The approximate area occupied by each compatibility class is listed in Table 9-17.

Table 9-16 Scenery Resource Flood Protection Methods Compatibility Classes Matrix

Landscape Character Units	Non-structural	Soft Structural	Semisoft Structural	Enhanced Hard Structural	Semihard Structural	Hard Structural	Comp. Class
	(Class 1)	(Class 2)	(Class 3)	(Class 4)	(Class 5)	(Class 6)	
Natural River Channel	C	C	C	IC	IC	IC	3
Rural River Channel	C	C	C	IC	IC	IC	3
Suburban River Channel	C	C	C	IC	IC	IC	3
Urban River Channel	C	C	C	IC	IC	IC	3
Industrial River Channel	C	C	C	C	IC	IC	4
Natural River Terrace	C	C	C	IC	IC	IC	3
Rural River Terrace	C	C	C	IC	IC	IC	3
Suburban River Terrace	C	C	C	IC	IC	IC	3
Urban River Terrace	C	C	C	C	IC	IC	4
Industrial River Terrace	C	C	C	C	IC	IC	4
Natural Valley Plain	C	C	C	IC	IC	IC	3
Rural Valley Plain	C	C	C	IC	IC	IC	3
Suburban Valley Plain	C	C	C	IC	IC	IC	3
Urban Valley Plain	C	C	C	C	IC	IC	4
Industrial Valley Plain	C	C	C	C	C	C	6
Natural Valley Wash	C	IC	IC	IC	IC	IC	1
Rural Valley Wash	C	IC	IC	IC	IC	IC	1
Suburban Valley Wash	C	IC	IC	IC	IC	IC	1
Urban Valley Wash	C	IC	IC	IC	IC	IC	1
Industrial Valley Wash	C	IC	IC	IC	IC	IC	1
Natural Arroyo	C	IC	IC	IC	IC	IC	1
Rural Arroyo	C	IC	IC	IC	IC	IC	1
Suburban Arroyo	C	IC	IC	IC	IC	IC	1
Urban Arroyo	C	IC	IC	IC	IC	IC	1
Industrial Arroyo	C	IC	IC	IC	IC	IC	1
Natural Upper Bajada	C	C	IC	IC	IC	IC	2
Rural Upper Bajada	C	C	IC	IC	IC	IC	2
Suburban Upper Bajada	C	C	C	IC	IC	IC	3
Urban Upper Bajada	C	C	C	IC	IC	IC	3
Industrial Upper Bajada	C	C	C	C	IC	IC	4
Natural Lower Bajada	C	C	C	IC	IC	IC	3
Rural Lower Bajada	C	C	C	IC	IC	IC	3
Suburban Lower Bajada	C	C	C	IC	IC	IC	3
Urban Lower Bajada	C	C	C	C	IC	IC	4
Industrial Lower Bajada	C	C	C	C	IC	IC	4
Natural Foothills	C	IC	IC	IC	IC	IC	1
Rural Foothills	C	IC	IC	IC	IC	IC	1
Suburban Foothills	C	C	IC	IC	IC	IC	2
Urban Foothills	C	C	C	IC	IC	IC	3
Industrial Foothills	C	C	C	IC	IC	IC	3
Natural Mountains	C	IC	IC	IC	IC	IC	1
Rural Mountains	C	IC	IC	IC	IC	IC	1
Suburban Mountains	C	IC	IC	IC	IC	IC	1
Urban Mountains	C	IC	IC	IC	IC	IC	1
Industrial Mountains	C	IC	IC	IC	IC	IC	1

NOTES: Comp. = compatibility
 Compatibility Ratings
 C = complementary and compatible
 IC = not complementary or compatible

Table 9-17 Summary of Scenery Resource Flood Protection Methods Compatibility Classes Found in the Rainbow Valley Study Area

Compatibility Class	Acres	Percentage (%) of Study Area
Class 1	61,576	19
Class 2	22,748	17
Class 3	82,825	62
Class 4	5,272	2
Class 6	2,079	>1

NOTE: > = more than

Most of the Rainbow Valley study area is designated as Compatibility Class 3, or is compatible with a nonstructural, soft structural, or semisoft structural flood control method.

Approximately 19 percent of the study area is designated as Compatibility Class 1 and is compatible only with the nonstructural method. The mountain lands, such as the Sierra Estrella and Maricopa Mountains and the foothills associated with those mountain ranges, are given this designation due to their inherently high visual quality and the difficulty of complementing the visual character of these areas using semisoft or other methods that have the potential to visually impact the landscape.

Compatibility Class 2, which makes up 17 percent of the study area, is comprised primarily of the natural and rural upper bajada landscape character units. The suburban foothills landscape character unit, located in the northern portion of the study area near the Sierra Estrella, is also included in this compatibility class.

Over half (62 percent) of the Rainbow Valley study area is predicted to be Compatibility Class 3 in the future. The area that comprises this class consists primarily of the river lands and valley lands subtypes between the Sierra Estrella and the north and south Maricopa Mountain ranges. The Compatibility Class 3 rating is due to the predominantly natural and rural visual character predicted for the river and valley lands within the Rainbow Valley study area. The suburban and rural development in this area is compatible with the natural forms of the Compatibility Class 3 methods and is able to visually absorb the limited hard structures associated with this method. The urban and industrial foothills are also restricted to this class due to the dominant visual character of the surrounding foothill lands. The mountainlike landform, variation in vegetation densities, and varied slopes of the foothills would be highly contrasted by an architectonic flood control method, such as a hard structural method.

Compatibility Class 4 accounts for 2 percent of the study area. These areas are associated with the predicted urban valley plains, river terrace, and river channel landscape character units

planned for the project area. These areas are along the Gila River and throughout the valley plains, primarily within the City of Goodyear's planning area and the area south of the Sierra Estrella.

Less than 1 percent of the project area is designated as Compatibility Class 6 and is compatible with all six flood protection methods. Compatibility Class 6 designations are limited to the industrial valley plain landscape character unit, associated with the Butterfield Station Landfill, the tire recycling center, and the airport.

9.5.6 Recreation and Open Space Resources

Parks and Recreation Resources Structure Types Compatibility

The structure type compatibility ratings listed in Table 9-18 were determined by comparing the visual character and degree of landscape modification that are typically associated with implementation of each structure type with the visual character, desired recreational experience, and level of development and landscape modification typically associated with the parks and recreation features listed in the inventories of existing recreation resources contained in the LIA for Maricopa County.

**Table 9-18 Parks and Recreation Resources Structure Types
Compatibility Ratings Table**

Parks and Recreation Resources	Non-structural (Class 1)	Under-ground Pipe (Class 2)	Channel- Levee (Class 3)	Channel (Class 4)	Storage Basin (Class 5)	Dam (Class 6)	Comp. Class
<i>Federal</i>							
Wilderness Areas	C	IC	IC	IC	IC	IC	1
National Monuments	C	IC	IC	IC	IC	IC	1
Other BLM Land	C	C	C	C	C	C	6
<i>State</i>							
Wildlife Areas	C	IC	IC	IC	IC	IC	1
<i>Regional</i>							
County Regional Parks	C	C	C	C	IC	IC	4
City Regional Parks	C	IC	IC	IC	IC	IC	1
<i>Local</i>							
City and County Parks							
Rural	C	C	C	C	C	IC	5
Suburban	C	C	C	C	C	IC	5
Urban	C	C	C	C	C	IC	5
Other Recreation Areas							
Golf Courses	C	C	C	C	C	IC	5

NOTES: Comp. = compatibility, BLM = Bureau of Land Management

Compatibility Ratings

C = Structure is fully compatible with the parks and recreation resource.

IC = Structure type is incompatible with the parks and recreation resource.

The structure type compatibility ratings were combined in GIS with the parks and recreation resources map for the Rainbow Valley study area to produce the compatibility map for parks and recreation resources structure types (Figure 9-16), and their distribution is shown in Table 9-19. The compatibility classes shown on this map indicate the range of flood protection structure types that are expected to be compatible with, and complementary to, the existing and planned recreation resources in the Rainbow Valley study area.

Table 9-19 Summary of Parks and Recreation Resources Flood Structure Types Compatibility Classes

Compatibility Class	Acres	Percentage (%) of Study Area
Class 1	124,880	38
Class 4	19,342	6
Class 5	24,389,783	>1
Class 6		27

NOTE: > = more than

Compatibility Class 1, which makes up 38 percent of the Rainbow Valley study area, consists of federal and state land, such as wilderness areas, national monuments, and regional city parks. These areas include the Sierra Estrella Wilderness Area, which comprises the southern portion of the Sierra Estrella range and straddles the eastern boundary; the north and south Maricopa Mountain wilderness areas along the western and southwestern boundaries; and the Sonoran Desert National Monument, which comprises a majority of the southwestern portion of the study area. South Mountain Park, located east of Rainbow Valley but within the 10-mile buffer of the study area, is included in this compatibility class.

Approximately 27 percent of the study area is designated as Compatibility Class 6 and is compatible with all six flood control structure types. This compatibility class includes BLM land, which is located throughout the study area but primarily within the valley plain and along Watermain Wash and other washes. Foothills in the northwestern portion of the study area and south of the Sierra Estrella Wilderness Area are also in this compatibility class.

Compatibility Class 4 accounts for 6 percent of the study area and includes the Estrella Mountain Regional Park south of the Gila River at the northern end of the study area.

Less than 1 percent of the study area is designated as Compatibility Class 5 and is compatible with nonstructural, underground pipes, levees, channels, and storage basins. This compatibility class consists of city and county parks in rural, suburban, and urban areas in the valley plain in the northern portion of the study area.

Parks and Recreation Resources Flood Protection Methods Compatibility

Compatibility ratings for the parks and recreation flood protection methods provide an indication of the range of flood protection methods that are expected to complement the types of recreational activities, services, and experiences provided by the different kinds of parks and recreation uses identified in the Rainbow Valley ADMP inventory.

Each category of parks and recreational areas identified in the District's countywide LIA were evaluated for its compatibility with the six flood protection methods described above. 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 and the types of recreational experiences provided or expected to be provided; (2) the types and levels of development and landscape alteration that are typically associated with each flood protection method, as reflected in narrative descriptions and photographic examples of the methods; and (3) the character of the landscapes that are typically associated with each type of park or recreation resource in the inventory.

The compatibility ratings and resulting compatibility classes for the parks and recreation resources within the Rainbow Valley study area are summarized in Table 9-20.

**Table 9-20 Summary of Compatibility Classes for Parks and Recreation Resources
Flood Protection Methods**

Parks and Recreation Resources	Non-structural (Class 1)	Soft Structural (Class 2)	Semisoft Structural (Class 3)	Enhanced Hard Structural (Class 4)	Semihard Structural (Class 5)	Hard Structural (Class 6)	Comp. Class
<i>Federal</i>							
Wilderness Areas	C	IC	IC	IC	IC	IC	1
National Monuments	C	IC	IC	IC	IC	IC	1
Other BLM Land	C	C	C	IC	IC	IC	3
<i>State</i>							
Wildlife Areas	C	IC	IC	IC	IC	IC	1
<i>Regional</i>							
County Regional Parks	C	C	IC	IC	IC	IC	2
City Regional Parks	C	IC	IC	IC	IC	IC	1
<i>Local</i>							
City and County Parks							
Rural	C	C	C	IC	IC	IC	3
Suburban	C	C	C	IC	IC	IC	3
Urban	C	C	C	C	IC	IC	4
Other Recreation Areas							
Golf Courses	C	C	C	IC	IC	IC	3

NOTES: Comp. = compatibility, BLM = Bureau of Land Management

Compatibility Ratings

C = complementary and compatible

IC = not complementary or compatible

The flood protection methods compatibility matrix for parks and recreation areas was used by the District to map compatibility class information for parks and recreation resources flood protection methods as part of the LIA. The parks and recreation flood protection methods compatibility for the Rainbow Valley study area was created using the LIA, as well as by applying the flood protection methods compatibility matrix to the additional information obtained for the parks and recreation resources mapping. The distribution of the parks and recreation resources and their associated flood protection method compatibility classes for the Rainbow Valley study area are provided in Table 9-21 and shown in Figure 9-17.

Table 9-21 Summary of Parks and Recreation Resources Flood Protection Methods Compatibility Classes

Compatibility Class	Acres	Percentage (%) of Study Area
Class 1	124,880	38
Class 2	19,343	6
Class 3	90,016	27
Class 4	12	<1

NOTE: < = less than

Most of the Rainbow Valley study area is designated as Compatibility Class 1 and is compatible only with nonstructural flood protection methods. This compatibility class includes the same federal and state land that was identified previously section as having a Compatibility Class 1 rating for parks and recreation resources structure types.

Approximately 27 percent of the study area is designated as Compatibility Class 3 and is compatible with nonstructural, soft structural, and semisoft structural flood protection methods. This compatibility class includes BLM land that is located throughout the study area but found primarily within the valley plain and along Watermain Wash and other washes. Foothills in the northwestern portion of the study area and south of the Sierra Estrella Wilderness Area are also included in this compatibility class.

Class 2 compatibility accounts for 6 percent of the study area and includes the Estrella Mountain Regional Park south of the Gila River at the northern end of the study area.

Less than 1 percent of the project area is designated as Compatibility Class 4 and is compatible with nonstructural, soft structural, semisoft, and enhanced hard structural flood protection methods. This compatibility class is composed of city and county parks in urban areas and is mostly found north of the South Mountain Park.

Open Space Resources Structure Types Compatibility

The structure types compatibility ratings listed in Table 9-22 were determined by comparing the visual character and degree of landscape modification that is typically associated with implementation of each structure type with the desired visual character and specified level of landscape modification associated with the open space resources identified in the District's LIA for Maricopa County. Structure types that are rated as incompatible may, in some instances, achieve compatibility through the application of special or extraordinary treatments and designs. The structure type compatibility ratings in Table 9-23 were applied in GIS with the open space resources map coverage for the Rainbow Valley study area to produce a compatibility class map for open space resources structure types (Figure 9-18). The compatibility classes shown in Figure 9-18 indicate the range of flood protection structure types that are expected to be compatible with, and complementary to, open space resources in the Rainbow Valley study area.

Table 9-22 Open Space Resources Structure Types Compatibility Ratings Table

Open Space Resources	Non-structural (Class 1)	Under-ground Pipe (Class 2)	Channel-Levee (Class 3)			Channel (Class 4)			Storage Basin (Class 5)			Dam (Class 6)			Comp. Class
			S	M	L	S	M	L	S	M	L	S	M	L	
			<i>Desert Spaces Open Space Plan</i>												
Secured Open Space															
<i>Federal</i>															
Wilderness Areas	C	IC	IC			IC			IC			IC			1
National Monuments	C	IC	IC			IC			IC			IC			1
<i>State</i>															
Wildlife Areas	C	IC	IC			IC			IC			IC			1
<i>Regional</i>															
County Regional Parks	C	C	C			C			IC			IC			4
City Regional Parks	C	IC	IC			IC			IC			IC			1
Conservation Open Spaces	C	IC	IC			IC			IC			IC			1
Retention Open Spaces	C	C	C			C			C			C			6
<i>Other Federal Open Space Lands</i>															
BLM	C	C	C			C			C			C			6
National Forest Lands	C	C	C			C			C			C			6
<i>Floodplain Lands</i>															
Floodways	C	IC	IC			IC			IC			IC			1
Floodplain Fringe Areas and Other Floodplain Zones	C	IC	IC			IC			IC			IC			1

NOTES: Comp. = compatibility, BLM = Bureau of Land Management
Compatibility Ratings
 C = Structure is fully compatible with the open space resource.
 IC = Structure type is incompatible with the open space resource.
Structure-Scale Subclasses
 S = Small structures are compatible.
 M = Small and medium-sized structures are compatible.
 L = Small, medium, and large structures are compatible.

**Table 9-23 Summary of Open Space Resources Structure Types
Compatibility Classes**

Compatibility Class	Acres	Percentage (%) of Study Area
Class 1	152,608	46
Class 4	19,108	6
Class 6	62,212	19

Forty-six percent of the Rainbow Valley study area is designated as Compatibility Class 1 and is context sensitive only with nonstructural flood control structure types. This compatibility class consists of federal and state land, which includes wilderness areas, national monuments, city regional parks, and conservation open spaces. This includes the Sierra Estrella Wilderness Area, which encompasses the southern portion of the Sierra Estrella and straddles the eastern boundary; the north and south Maricopa Mountain wilderness areas along the western and southwestern boundaries; and the Sonoran Desert National Monument, which composes most of the southwestern portion of the study area. South Mountain Park, located east of Rainbow Valley but within the 10-mile buffer of the study area, is included in this compatibility class. This class also includes floodplain land, such as floodways, floodplain fringe areas, and other floodplain zones. These areas include the Watermain Wash, smaller washes in the valley plain that drain toward the Watermain Wash, and the Gila River.

Approximately 19 percent of the study area is designated as Compatibility Class 6 and is compatible with all six flood control structure types. These areas include retention open spaces, as identified in the *MAG Desert Spaces Plan*, and they are located in the upper bajada along the Sierra Estrella and floodplain regions. Other locations within the study area that are designated as Compatibility Class 6 include BLM land located throughout the valley plains as well as national forest land.

The remaining 6 percent of the study area is designated as Compatibility Class 4 and includes the Estrella Mountain Regional Park south of the Gila River at the northern end of the study area.

Open Space Resources Flood Protection Methods Compatibility

Open space flood protection methods compatibility ratings provide an indication of the range of flood protection methods that are expected to complement the types of activities and experiences provided by the different kinds of open spaces identified in the inventory.

Each category of open space area identified in the District's countywide LIA was evaluated for its compatibility with the six flood protection methods. Each method was then rated as either

compatible or incompatible. The compatibility ratings were developed based on a correlation of (1) the recreation management direction and types of recreational 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 photographic examples of the methods; and (3) the character of the landscapes that are typically associated with each type of open space resource in the inventory.

The compatibility ratings and resulting compatibility classes for the open space resources within the Rainbow Valley study area are summarized in Table 9-24.

Table 9-24 Summary of Open Space Resources Flood Protection Methods Compatibility Classes

Open Space Resources	Non-structural (Class 1)	Soft Structural (Class 2)	Semisoft Structural (Class 3)	Enhanced Hard Structural (Class 4)	Semihard Structural (Class 5)	Hard Structural (Class 6)	Comp. Class
<i>Desert Spaces Open Space Plan</i>							
Secured Open Space							
<i>Federal</i>							
Wilderness Areas	C	IC	IC	IC	IC	IC	1
National Monuments	C	IC	IC	IC	IC	IC	1
<i>State</i>							
Wildlife Areas	C	IC	IC	IC	IC	IC	1
<i>Regional</i>							
County Regional Parks	C	C	IC	IC	IC	IC	2
County Recreation Areas	C	C	C	IC	IC	IC	3
Conservation Open Spaces	C	IC	IC	IC	IC	IC	1
Retention Open Spaces	C	C	C	IC	IC	IC	3
<i>Other Federal Open Space Lands</i>							
BLM	C	C	C	IC	IC	IC	3
National Forest Lands	C	C	C	IC	IC	IC	3
<i>Floodplain Lands</i>							
Floodways	C	IC	IC	IC	IC	IC	1
Floodplain Fringe Areas and Other Floodplain Zones	C	IC	IC	IC	IC	IC	1

NOTES: Comp. = compatibility, BLM = Bureau of Land Management
Compatibility Ratings
 C = complementary and compatible
 IC = not complementary or compatible

The flood protection methods compatibility matrix for open space areas was used by the District to map the compatibility class information for the open space resources flood protection methods as part of the LIA. The open space flood protection methods compatibility for the Rainbow

Valley study area was created using the LIA, as well as by applying the flood protection methods compatibility matrix to the additional information obtained for the open space resources mapping. The distribution of the open space resources and their associated flood protection methods compatibility classes within the Rainbow Valley study area are demonstrated in Table 9-25 and shown in Figure 9-19.

Table 9-25 Summary of Open Space Resources Flood Protection Methods Compatibility Classes

Compatibility Class	Acres	Percentage (%) of Study Area
Class 1	152,608	46
Class 2	19,108	6
Class 3	62,212	19

Approximately 46 percent of the of the Rainbow Valley study area is designated as Compatibility Class 1 and is compatible only with nonstructural flood protection methods. This compatibility class consists of the same federal and state land and floodplain land that were identified as having a rating of Compatibility Class 1 for open space resources structure types.

Compatibility Class 3 accounts for 19 percent of the study area and is compatible with a nonstructural, soft structural, or semisoft structural flood protection method. These areas include retention open spaces, as identified in the *MAG Desert Spaces Plan*, and they are located in the upper bajada along the Sierra Estrella and floodplain regions. Other location within the study area that are designated as Compatibility Class 6 include BLM land located throughout the valley plains as well as national forest land.

The remaining 6 percent of the study area is designated as Compatibility Class 2 and includes the Estrella Mountain Regional Park south of the Gila River at the northern end of the study area.

9.5.7 Combined Resources Flood Protection Methods Compatibility

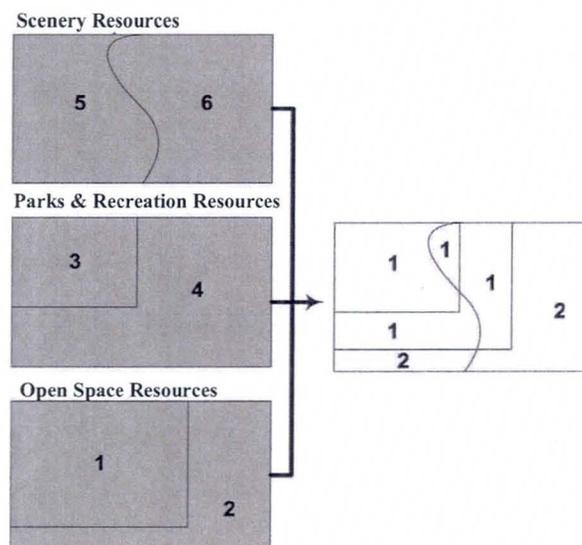
The combined flood protection methods compatibility map for the Rainbow Valley study area was produced by using GIS to overlay the flood protection methods compatibility class maps developed for biological, cultural, scenic, parks and recreation, and open space resources.

In producing the map, the lowest compatibility class shown for any particular land area was retained. The example below Graphic 9-1 illustrates this process using three maps—the scenery, parks and recreation, and open space resources flood protection method compatibility maps (Figures 9-15, 9-17, and 9-19). The compatibility class map for combined resources flood

protection methods would assign a Compatibility Class 1 rating to an area that is identified as follows:

- Compatibility Class 5 on the Scenery Resources Flood Protection Methods Compatibility Map (Figure 9-15)
- Compatibility Class 3 on the Parks and Recreation Resources Flood Protection Methods Compatibility Map (Figure 9-17)
- Compatibility Class 1 on the Open Space Resources Flood Protection Methods Compatibility Map (Figure 9-19)

Graphic 9-1 Example of Combined Resources Compatibility Mapping



In cases where the compatibility classes shown on the scenery resources flood protection methods compatibility map (Figure 9-19) for a given geographic area are either lower or the same as the compatibility classes on the other resource compatibility class maps, the compatibility class shown on the scenery resources compatibility class map will remain the same on the combined resources map. Where the compatibility class shown on any other resource compatibility map for a given geographic area is lower than that shown on the scenery resources compatibility map, then the latter compatibility class will be reduced on the combined resources compatibility map.

The combined resources flood protection methods compatibility map will indicate the range of methods that are expected to be compatible and context sensitive with the landscape settings and the biological, cultural, scenery, parks and recreation, and open space environments of the study area.

The map in Figure 9-21 displays the delineation of the combined compatibility classes for the biological, cultural, scenic, parks and recreation, and open space resources within the study area. Table 9-26 contains a summary of the distribution for these compatibility classes by the acreage and percentage of the study area that they occupy.

Table 9-26 Summary of Combined Future Resources Flood Protection Methods Compatibility Classes

Compatibility Class	Acres	Percentage (%) of Study Area
Class 1	205,136	62.2
Class 2	68,231	20.7
Class 3	52,648	16.0
Class 4	3,788	1.1
Class 5	2	<1

Note: < = less than

Flood protection method Compatibility Class 1 areas, or areas most compatible with a nonstructural flood protection method, comprise the largest amount of the study area. This delineation includes the mountain areas, flood plains, rivers, washes, and the planned wildlife corridor. In most cases, areas determined to be Compatibly Class 1 were given this designation due to the influence of multiple resources. This emphasizes the importance of the underlying resource value in these areas and the need for preserving this value in cases where the flood hazard risk level requires that a structural method be used instead.

Flood protection method Compatibility Class 2 areas comprise 20.7% of the study area. This delineation includes the natural upper bajada, the urban flood fringe, and most areas of creosote scrub, upland desertscrub, and salt desertscrub located outside of the secured open space areas.

Flood protection method Compatibility Class 3 areas comprise 16.0% of the study area. This delineation includes the majority of the valley plains between the mountains and Waterman Wash.

Flood protection method Compatibility Class 4 areas comprise 1.1% of the study area. This delineation includes the areas within the valley plains that are expected to develop as an urban

setting or areas of industrial upper bajada that did not occur in areas with more other resource designations.

9.6 PERFORMANCE CRITERIA

The goals and objectives previously described are restated as performance criteria and incorporated into an evaluation matrix as shown in Table 9-27. This section discusses the four goals of the study (as described in Section 9.3.2), which comprise the criteria by which the alternative plans will be judged.

9.6.1 Flood Hazard Protection

The project is first and foremost a drainage master plan. The District's mission is "to provide flood hazard identification, regulation, remediation, and education to the people in Maricopa County so that they can reduce their risks of injury, death, and property damage due to flooding while enjoying the natural and beneficial values served by floodplains". This criterion evaluates the effectiveness at reducing the risk of injury, death, and property damage due to flooding, with a preference toward alternatives that preserve natural and beneficial values of floodplains such as preserving natural vegetation and overbank flood storage areas.

9.6.2 Multipurpose Benefits

The District has long recognized the importance of context sensitivity in design of flood control structures and places an emphasis on providing multipurpose benefits to the community in which the project is placed. Significant attention is focused, during the data collection process, on identifying opportunities for multipurpose benefits as a way to enhance community pride and to leverage the dollars spent to create greater long-term value as well as to bring in project partners to aid in project implementation and maintenance.

9.6.3 Regional Land Planning Compatibility

The Rainbow Valley area, as well as much of the greater west valley area, has experienced unprecedented growth as demonstrated by the number of new homes built and the number of master-planned communities in some stage of development. Although this has slowed in the past year, the west valley area is poised for explosive growth in the not-so-distant future. As governmental agencies prepare for this growth, a significant number of regional planning studies have been completed, as described in this report. Coordination and plan compatibility with these other planning efforts has been identified as an important aspect of a successful drainage plan.

9.6.4 Implementation

The recommended plan will only become a reality if it can be implemented. Successful implementation is dependent on stakeholder support and participation, particularly the partner cities as well as a phased program that conforms to realistic funding streams. Successfully meeting the preceding three goals should help with implementation because it will benefit from synergy with other projects and interests that will help pave the way for implementation.

Table 9-27 Evaluation Matrix

Flood Hazard Protection

1	2	3	4	5
Doesn't solve existing flooding problems				Solves existing flooding problems
Provides low level of flood protection				Eliminates 100-year floodplains
Small benefited area				Maximizes benefited area
Requires human action to function during floods			Passive system, no intervention required	
Requires excessive maintenance to control veg		Allows for realistic levels of vegetation in channels		
Eliminates natural processes, concentrates flows			Preserves natural hydrologic processes	
Flow is diverted away from natural flow paths			Facilities follow existing flow paths	

Multi-Purpose Benefits

1	2	3	4	5
No opportunity for regional trail				Implements regional trail
No opportunity for local trail				Implements most local trail systems
No opportunity for recreation facilities				Implements recreation facilities
No east-west connections			Provides multiple east-west connections	
No features at Waterman Wash Gila River Confluence			Provides multiple features at confluence	
Degrades natural resources			Enhances natural resources	
Degrades cultural resources			Enhances cultural resources	
Truncates wildlife movement			Incorporates wildlife movement	
Detracts from desired visual character			complements desired visual character	
Does not extend character of Waterman Wash		Completely extends Waterman Wash character		
Obscures or damages sensitive landscapes			enhances sensitive viewsapes	
Increases degraded landscape			Restores degraded landscapes	
Decreases/damages existing open space value			Enhances exist open space value	

Regional Land Planning Compatibility

1	2	3	4	5
Requires General Plan modifications				Compatible with projected future land use
Creates conflicts with existing development plans				Compatible with development plans
Requires transportation plan modifications				Supports area transportation plans
No connectivity Between local and regional facilities				Optimizes local/regional connectivity
Meets with no other plans				Plan matches other agency plans

Implementation

1	2	3	4	5
Few funding sources available				Significant funding sources available
No partnering opportunities				Multiple partnering opportunities
No phasing opportunity				Many phasing opportunities
Implementation by FCDMC				Implementation by others
Requires an individual 404 permit				Meets Clean Water Act Requirements

9.7 NEXT STEPS

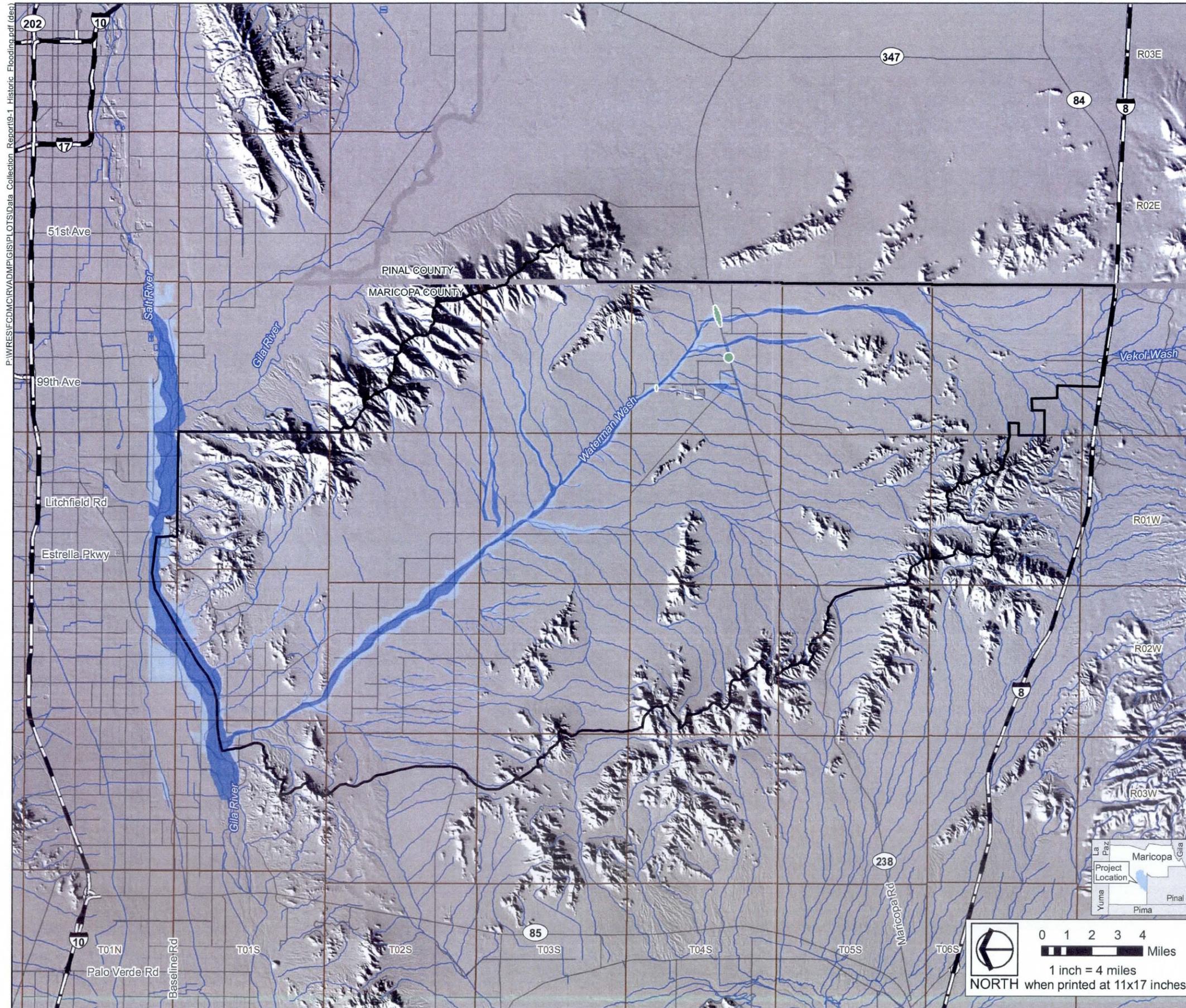
The agency stakeholder group will use this Data Collection Report to prepare for a brainstorming session. The information contained in this report will give the stakeholders an informed basis for identifying potential flood mitigation solutions for consideration by the project team. Following a presentation by the project team, the stakeholders will review several “seed idea” solutions developed in advance by the project team and will have the opportunity to comment on the seed ideas, generate new alternatives, and make modifications to the alternatives to be potentially carried forward to the preliminary alternatives analysis.

Based on a synthesis of the potential preliminary alternatives from the seed ideas and the agency stakeholder brainstorming meeting, the project team will formulate up to five preliminary alternatives for further evaluation. Those alternatives will be approved by the District and agency stakeholder group before proceeding with the analysis.

Rainbow Valley
Area Drainage Master Plan
Historic Flooding



Figure 9-1



Project Features

Historic Flooding Location

Floodplain Data

1% Annual Chance Floodplain

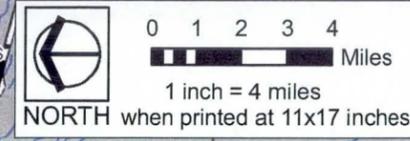
Floodway

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

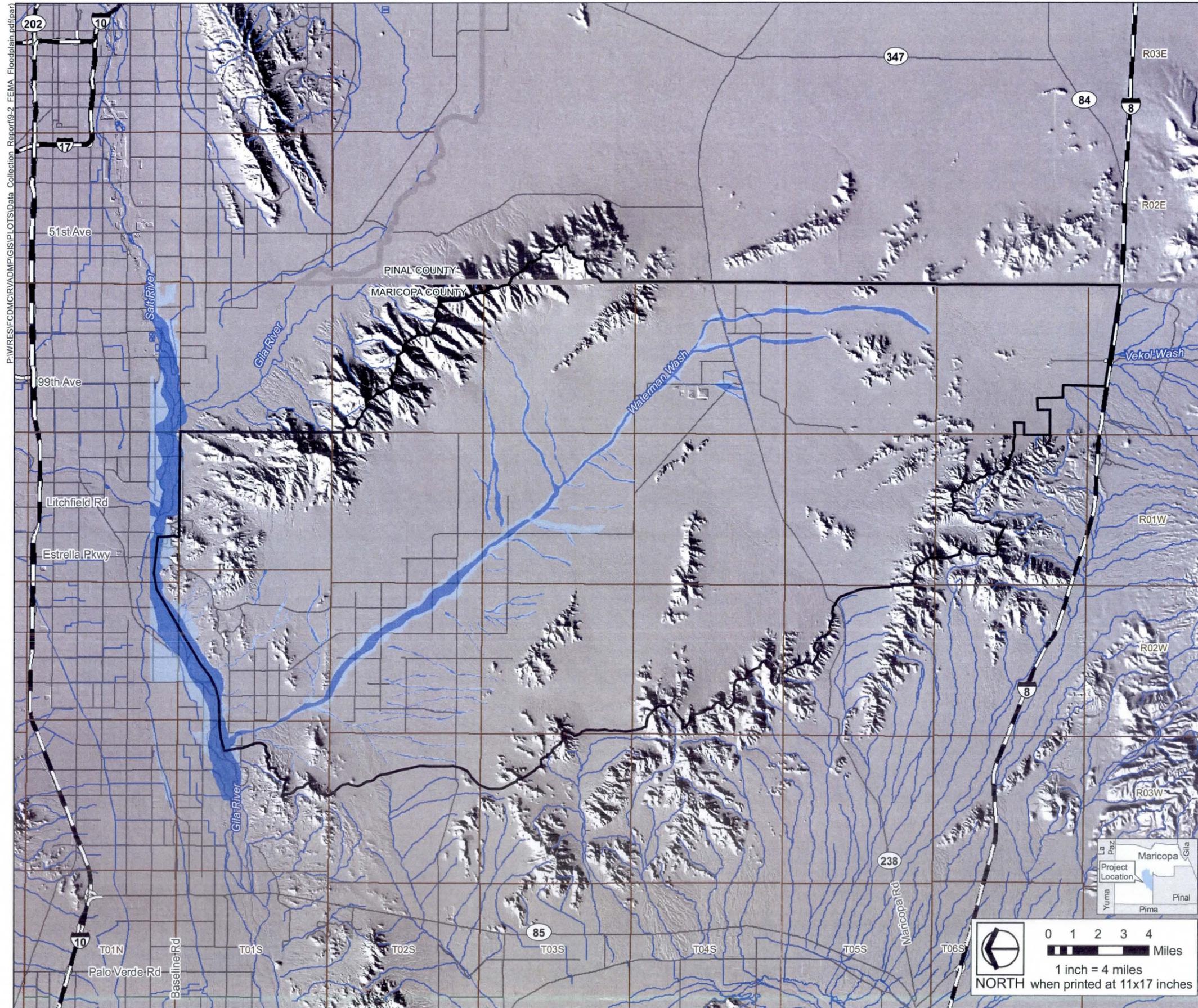
Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
URS Corporation
Historic Flooding, 2008



Rainbow Valley
Area Drainage Master Plan
FEMA Floodplain



Figure 9-2



Project Features

Floodplain Data

- 1% Annual Chance Floodplain
- Floodway

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008

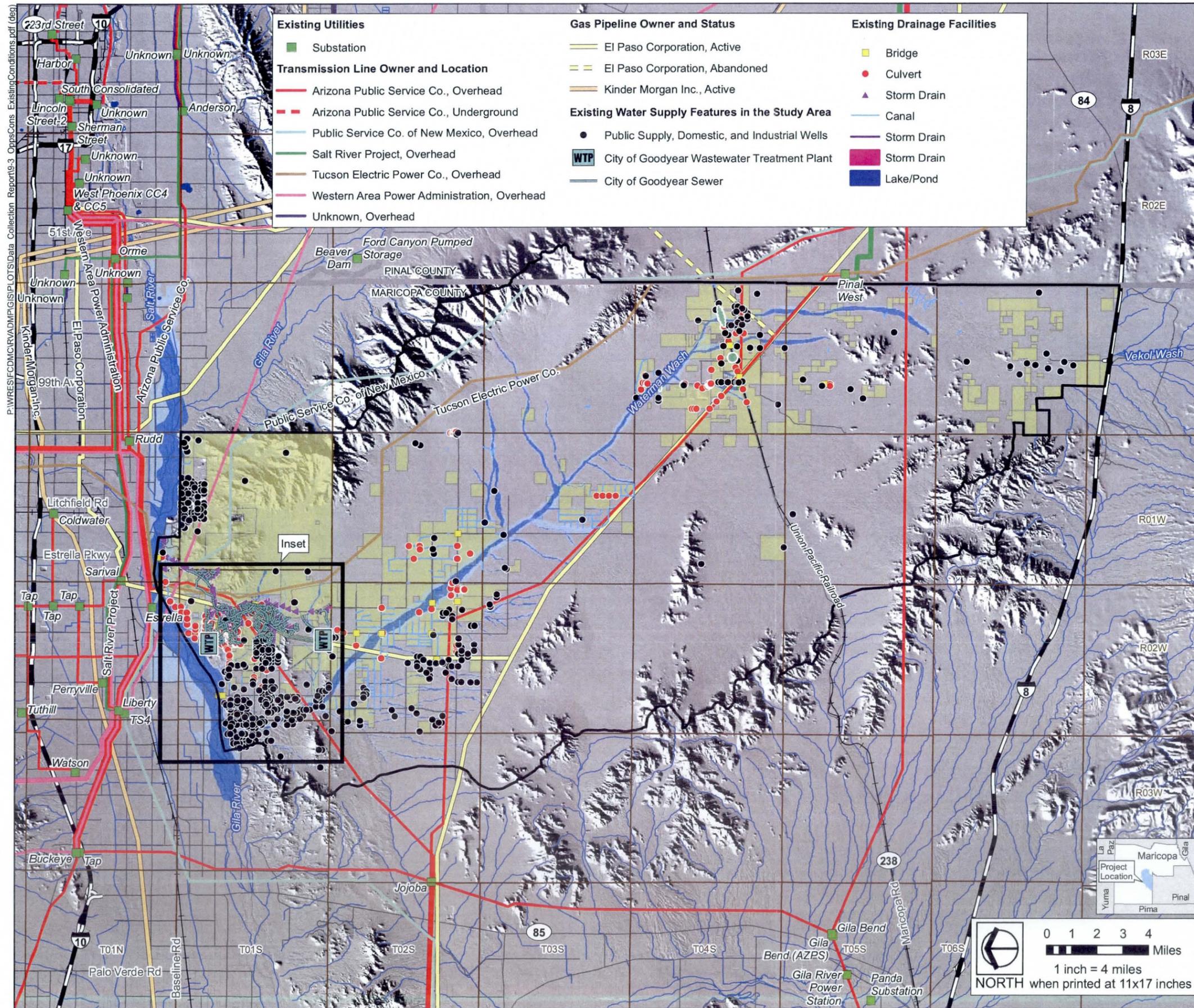
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Miles
1 inch = 4 miles
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Rainbow Valley Area Drainage Master Plan Opportunities and Constraints: Existing Conditions

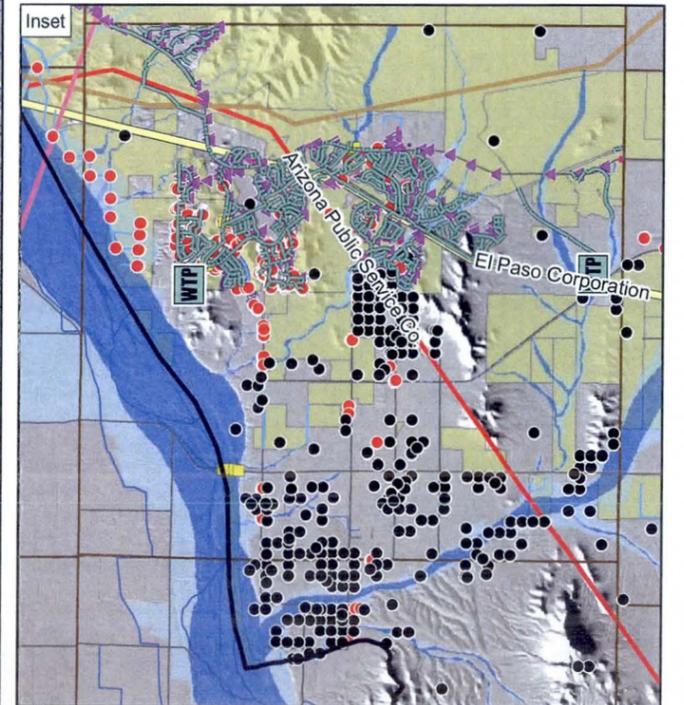


Figure 9-3



Project Features

- Major Land Holdings (See Figure 2-3 for Owner Information)
- Flood Data
 - 1% Annual Chance Floodplain
 - Historic Flooding Location
 - Floodway

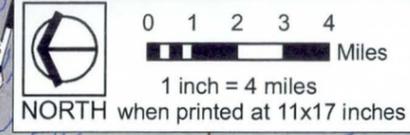


Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- Railroad
- River/Stream

Data Sources

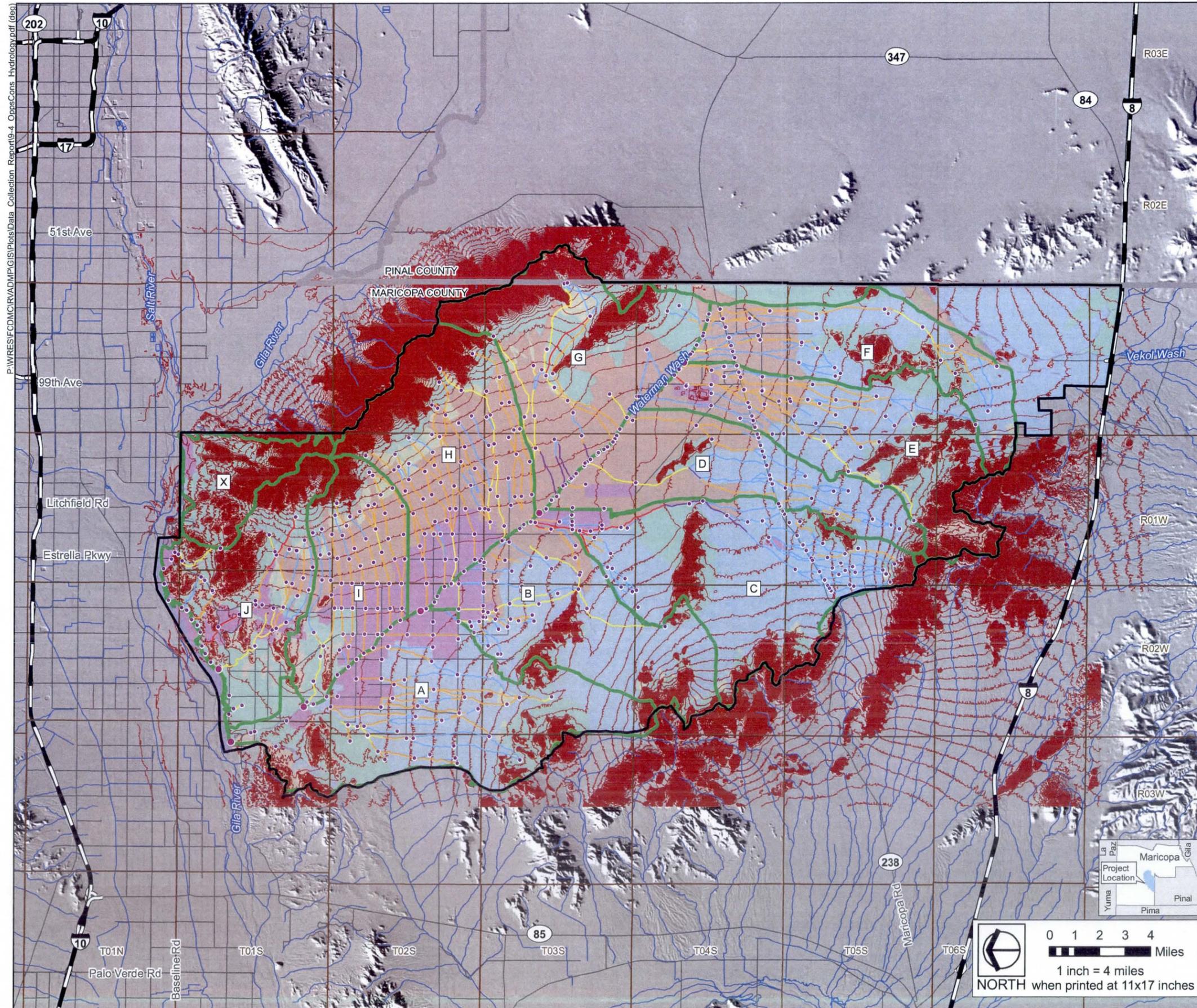
Flood Control District of Maricopa County
 Base Vector and Hillshade Data, 2008
 Platts, A Division of the McGraw-Hill Companies, Inc. - POWERmap (Platts analytical database)
 Transmission Line/Substation 2008
 PennWell MAPSearch
 Gas Pipeline 2006



Rainbow Valley
Area Drainage Master Plan
Opportunities and Constraints:
Hydrology



Figure 9-4



Project Features

- 40-foot Elevation Contour Line
- Drainage Concentration Point
- Major Drainage Concentration Point with Flow Rate

Drainage Flow Path with Flow Rate

- < 500 cfs
- 501 - 2,000 cfs
- 2,001 - 5,000 cfs
- 5,001 - 10,000 cfs
- > 10,000 cfs
- Major Drainage Basin Boundary
- Major Drainage Basin Name

Note:
Flow rates are based on a 100-year 24-hour event.
All flow rates are in cubic feet per second (cfs).

Flow Characteristics

- Alluvial Fan Flooding
- Disturbed Area
- Flood Retarding Structure
- Major River and Tributary Flooding
- Mountains
- Piedmont Distributary Flooding
- Piedmont Tributary Flooding
- Sheet Flooding
- Stockpond

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

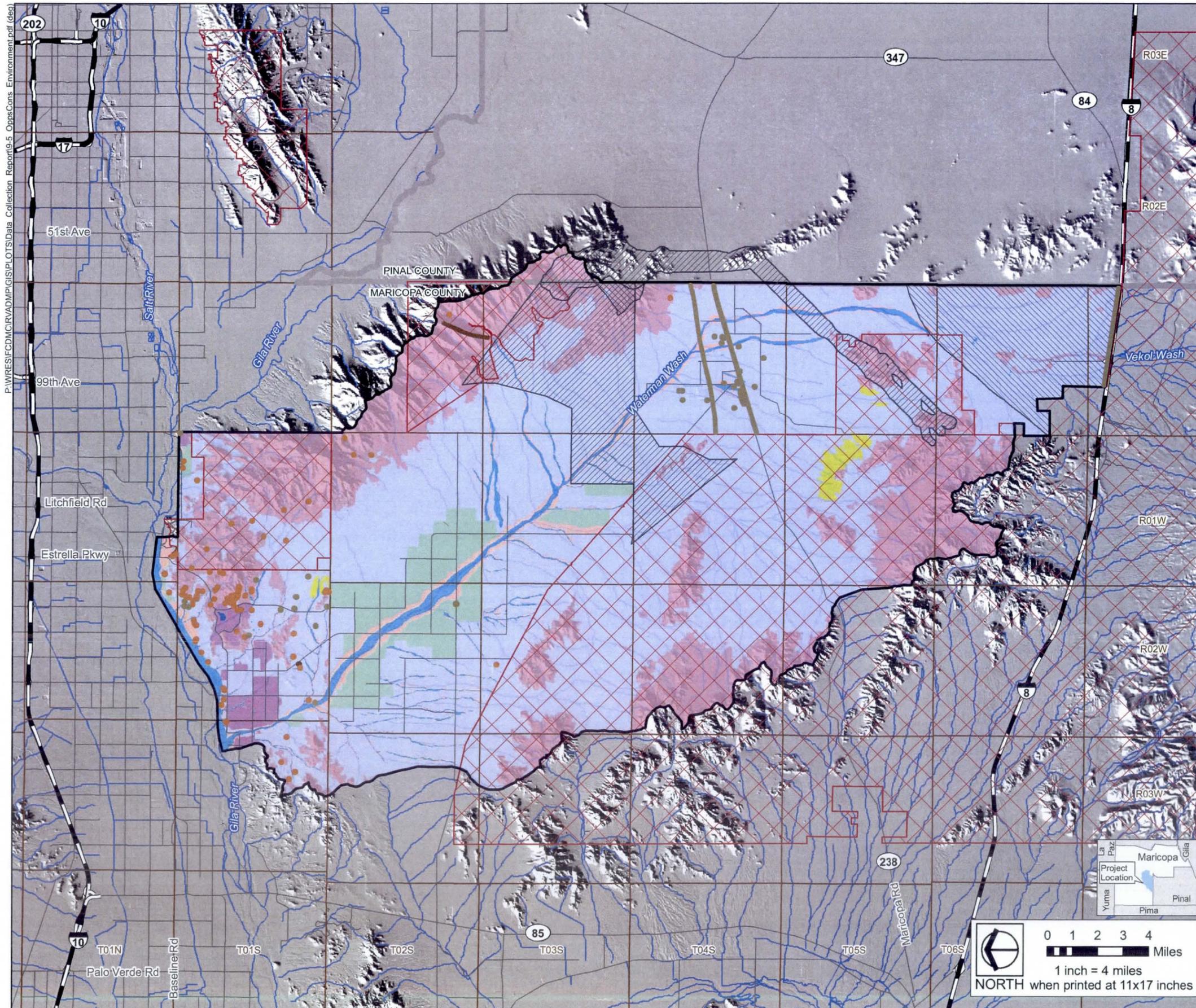
Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
JE Fuller/Hydrology & Geomorphology
Alluvial fan identification and flow characteristics assessment, 2008

Rainbow Valley
Area Drainage Master Plan
Opportunities and Constraints:
Environment



Figure 9-5



Project Features

Cultural Resources

- Historic Site
- Prehistoric-Historic Site
- Prehistoric Site

Ecological Units

- Agriculture
- Developed
- Floodway Fringe
- Mixed Creosote Scrub
- Mixed Salt Desert Scrub
- Mixed Upland Desert Scrub
- Mountain Woodland
- Open Water
- Riparian

Overlay Areas

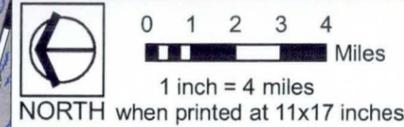
- Secured Open Space
- Vekol Valley Grassland Species Habitat
- Wildlife Corridor

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
Arizona Department of Game and Fish
Wildlife Corridors, 2008

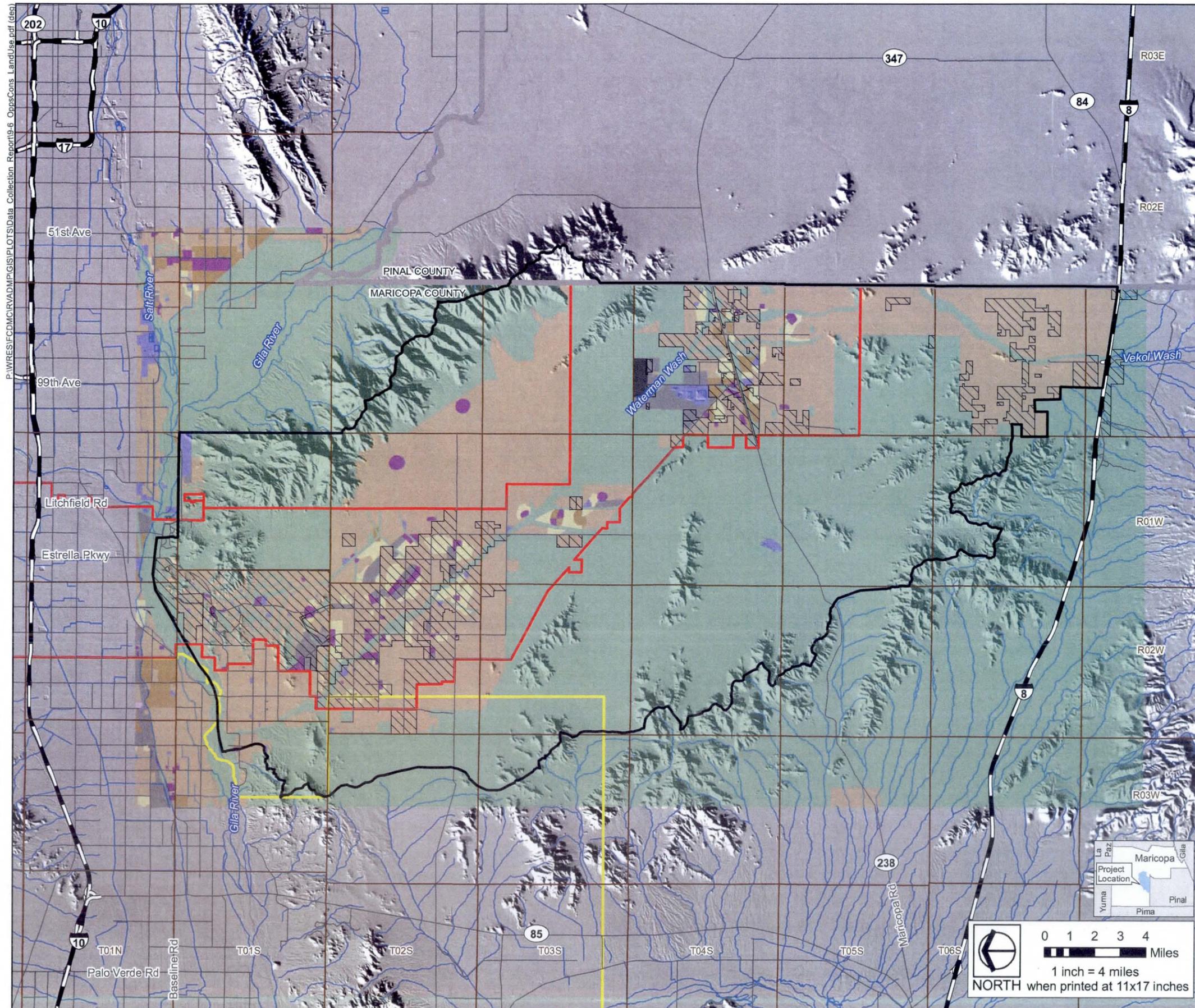


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Rainbow Valley
Area Drainage Master Plan
Opportunities and Constraints:
Land Use



Figure 9-6



Project Features

- Master Planned Community
(See Figure 7-1 for Community Information)
- Goodyear Planning Area
- Buckeye Planning Area
- Residential**
 - Multi Family Residential
 - Single Family Residential
- Public/Quasi Public**
 - Other/Public Employment
- Industrial/Commercial**
 - Industrial
 - Office
 - Retail
- Other**
 - Open Space
 - Transportation
 - Multiple Use

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
URS Corporation
Modified Master Planned Communities Data, 2008

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0 1 2 3 4 Miles

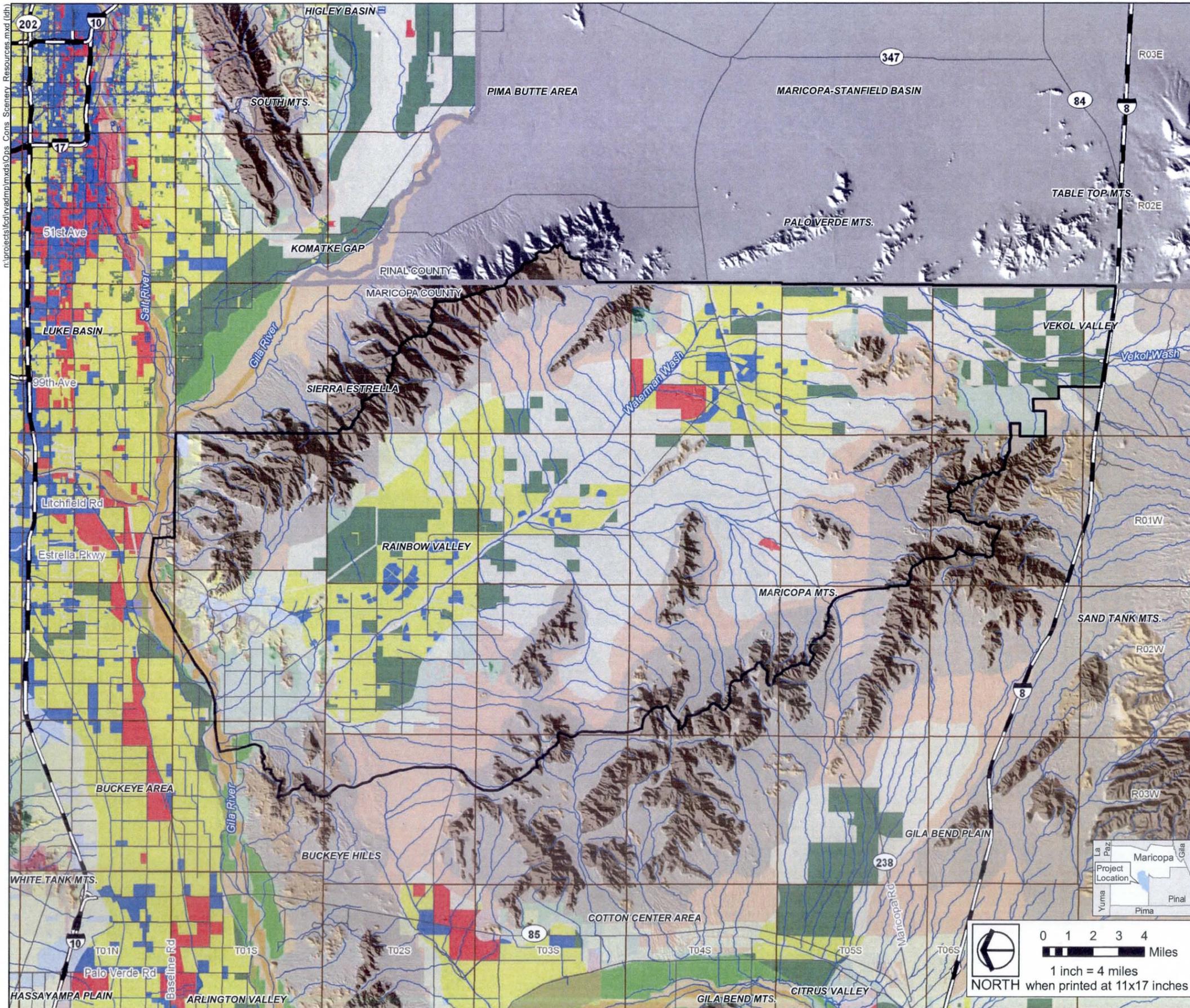
1 inch = 4 miles

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Rainbow Valley
Area Drainage Master Plan
Opportunities and Constraints: Scenery Resources



Figure 9-7



Project Features

Sonoran River Lands Subtype

- | | |
|--------------------------|--------------------------|
| Natural River Channel | Natural River Terrace |
| Rural River Channel | Rural River Terrace |
| Suburban River Channel | Suburban River Terrace |
| Urban River Channel | Urban River Terrace |
| Industrial River Channel | Industrial River Terrace |

Sonoran Valley Lands Subtype

- | | |
|--------------------------|------------------------|
| Natural Valley Plains | Natural Valley Wash |
| Rural Valley Plains | Rural Valley Wash |
| Suburban Valley Plains | Suburban Valley Wash |
| Urban Valley Plains | Urban Valley Wash |
| Industrial Valley Plains | Industrial Valley Wash |

Sonoran Mountain Lands Subtype

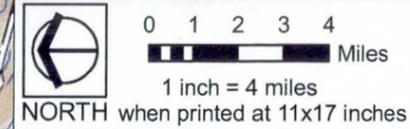
- | | |
|-----------------------|-------------------------|
| Natural Arroyo | Urban Upper Bajada |
| Rural Arroyo | Industrial Upper Bajada |
| Suburban Arroyo | Natural Lower Bajada |
| Urban Arroyo | Rural Lower Bajada |
| Industrial Arroyo | Suburban Lower Bajada |
| Natural Foothills | Urban Lower Bajada |
| Rural Foothills | Industrial Lower Bajada |
| Suburban Foothills | Natural Moutains |
| Urban Foothills | Rural Moutains |
| Industrial Foothills | Suburban Moutains |
| Natural Upper Bajada | Urban Moutains |
| Rural Upper Bajada | Industrial Moutains |
| Suburban Upper Bajada | |

Reference Features

- | | |
|---------------------------------|--------------------------------|
| County Boundary | Interstate Highway/
Freeway |
| Rainbow Valley
ADMP Boundary | Major Road |
| Township and Range
Boundary | River/Stream |

Data Sources

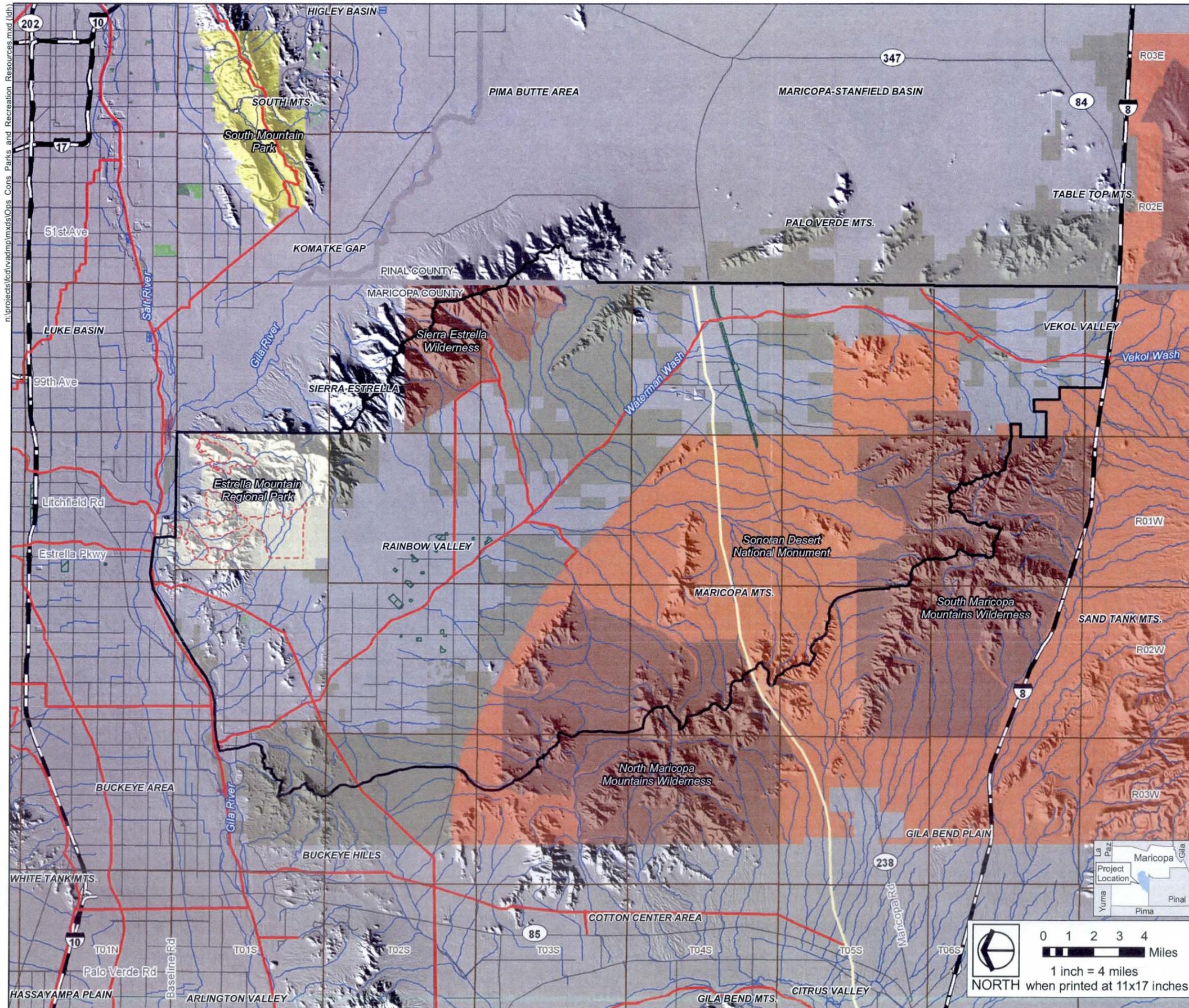
- Landscape Inventory & Analysis (LIA), 2008
Flood Control District of Maricopa County
Future Landscape Character Cultural Settings Map, 2008
Landscape Character Physical Settings Map, 2008



Rainbow Valley
Area Drainage Master Plan
Opportunities and Constraints: Parks and Recreation
Resources



Figure 9-8



Project Features

Federal

- Wilderness Area
- National Monument
- Bureau of Land Management
- Juan Bautista de Anza National Historic Trail

State

- Wildlife Area

Regional

- County Regional Park
- City Regional Park
- Maricopa County Regional Trail System

Local

- City Park
- Planned City Park
- Golf Course
- Community Trail

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/ Freeway
- Major Road
- River/Stream

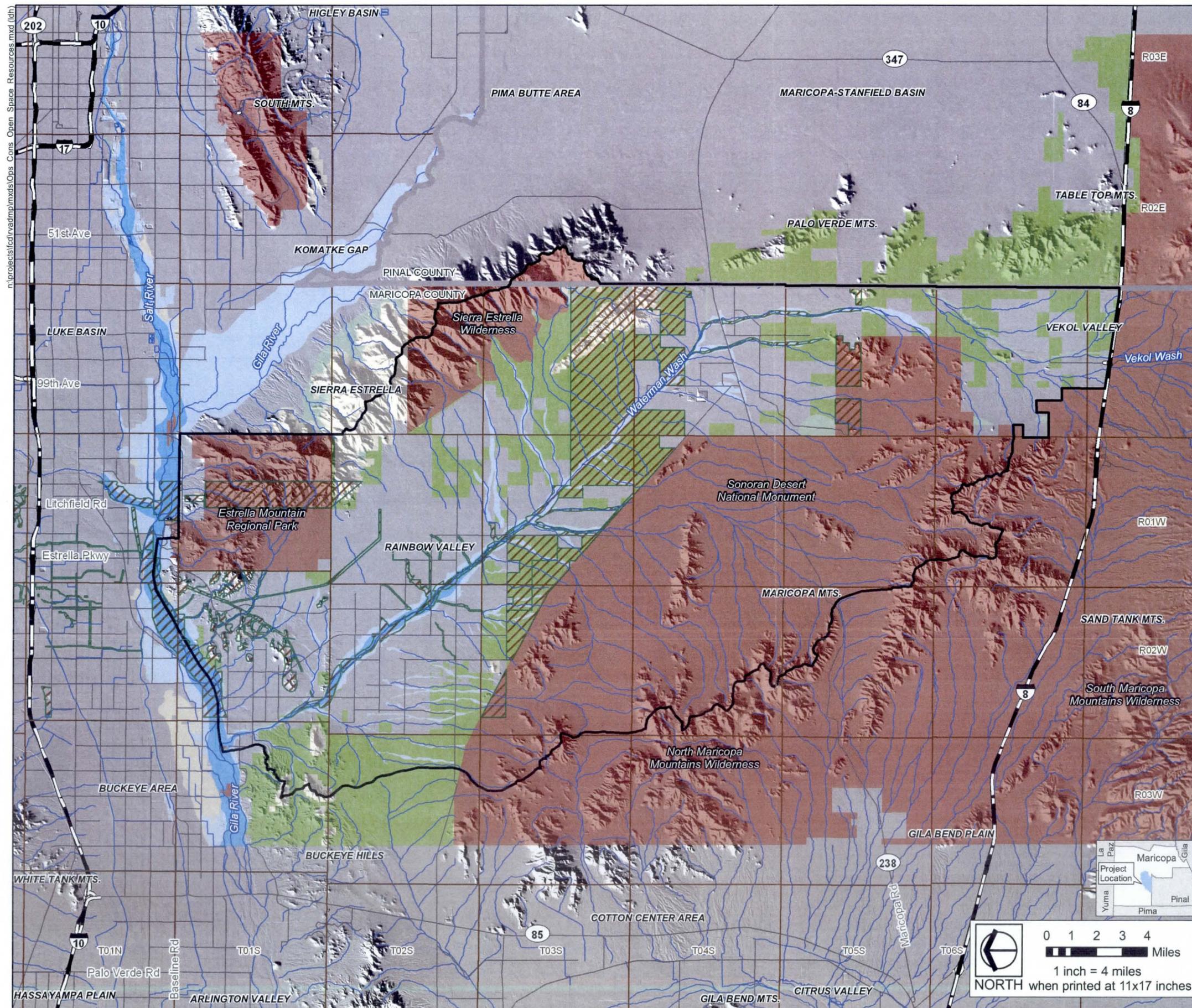
Data Sources

- Landscape Inventory & Analysis (LIA), 2008
- Flood Control District of Maricopa County
- Future Landscape Character Cultural Settings Map, 2008
- Landscape Character Physical Settings Map, 2008
- City of Goodyear
- Land Use Plan, 2008

Rainbow Valley
Area Drainage Master Plan
Opportunities and Constraints: Open Space
Resources



Figure 9-9



Project Features

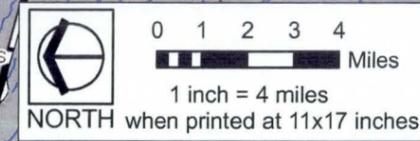
- Secured Open Space
 - Federal Wilderness Area
 - Federal National Monument
 - State Wildlife Area
 - County Regional Park
 - City Regional Park
- Open Space Conservation Area
- Open Space Retention Area
- Other Open Space Area
 - BLM Land
- Floodplain Floodway
- Floodplain Fringe & Other Floodplain Zone
- City of Goodyear Open Space
- Not Classified

Reference Features

- County Boundary
- Interstate Highway/
Freeway
- Rainbow Valley
ADMP Boundary
- Major Road
- Township and Range
Boundary
- River/Stream

Data Sources

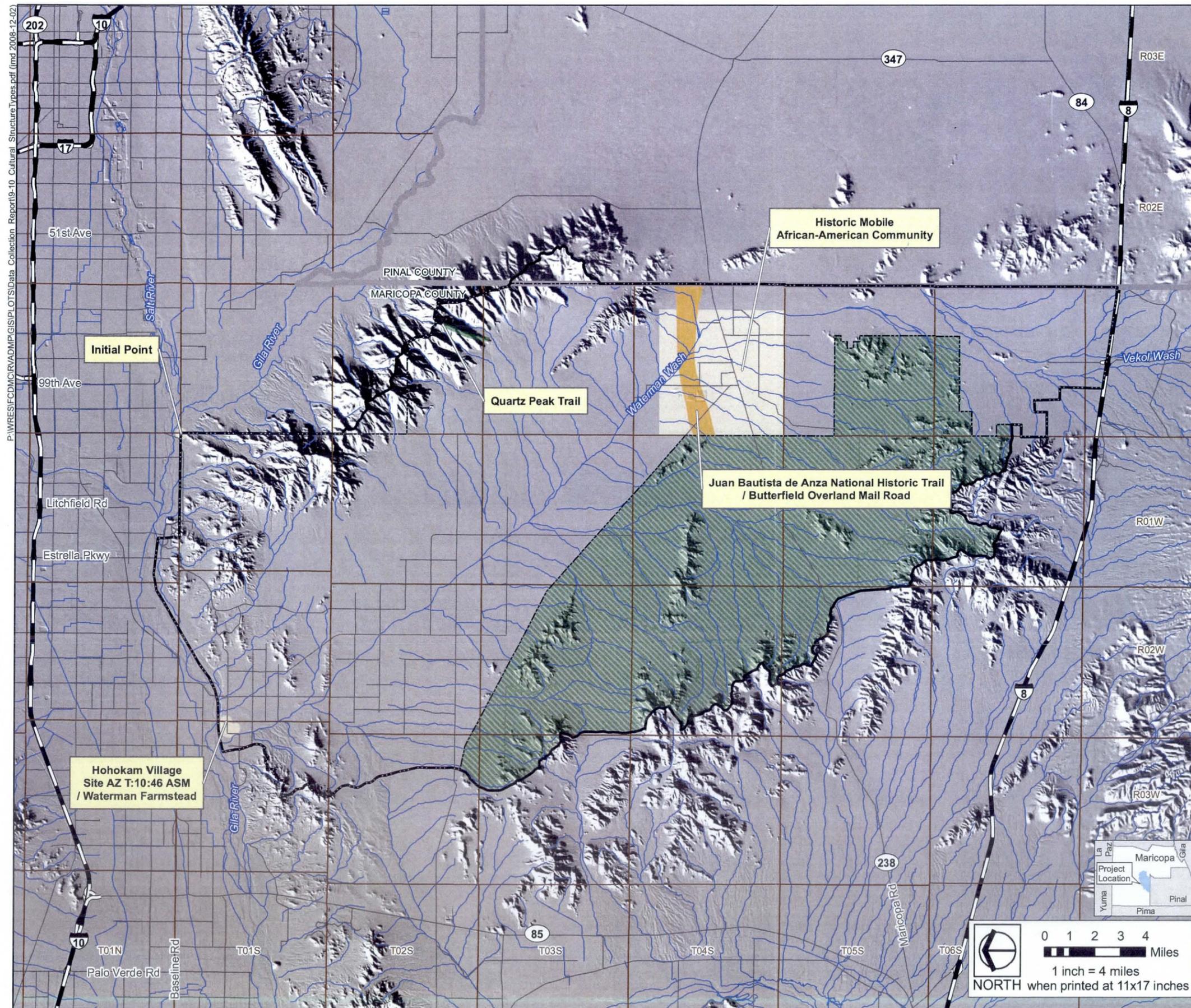
- Maricopa Association of Governments
MAG Desert Spaces, 2000
- Flood Control District of Maricopa County
Open Space Resources Map, 2008
- City of Goodyear
Land Use Plan, 2008



Rainbow Valley
Area Drainage Master Plan
Compatibility of Flood Protection Structure Types
with Selected Cultural Resources



Figure 9-10



Project Features

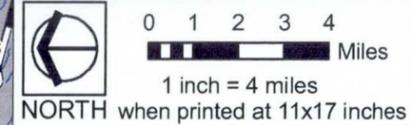
- Cultural Resource Assessment Area
- Sonoran Desert National Monument
- Flood Protection Structure Type Compatibility**
- Compatibility Class 1
- Compatibility Class 4
- Compatibility Class 6
- Not Classified

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
URS Corporation
Cultural Resource Data and Structure Type Compatibility, 2008

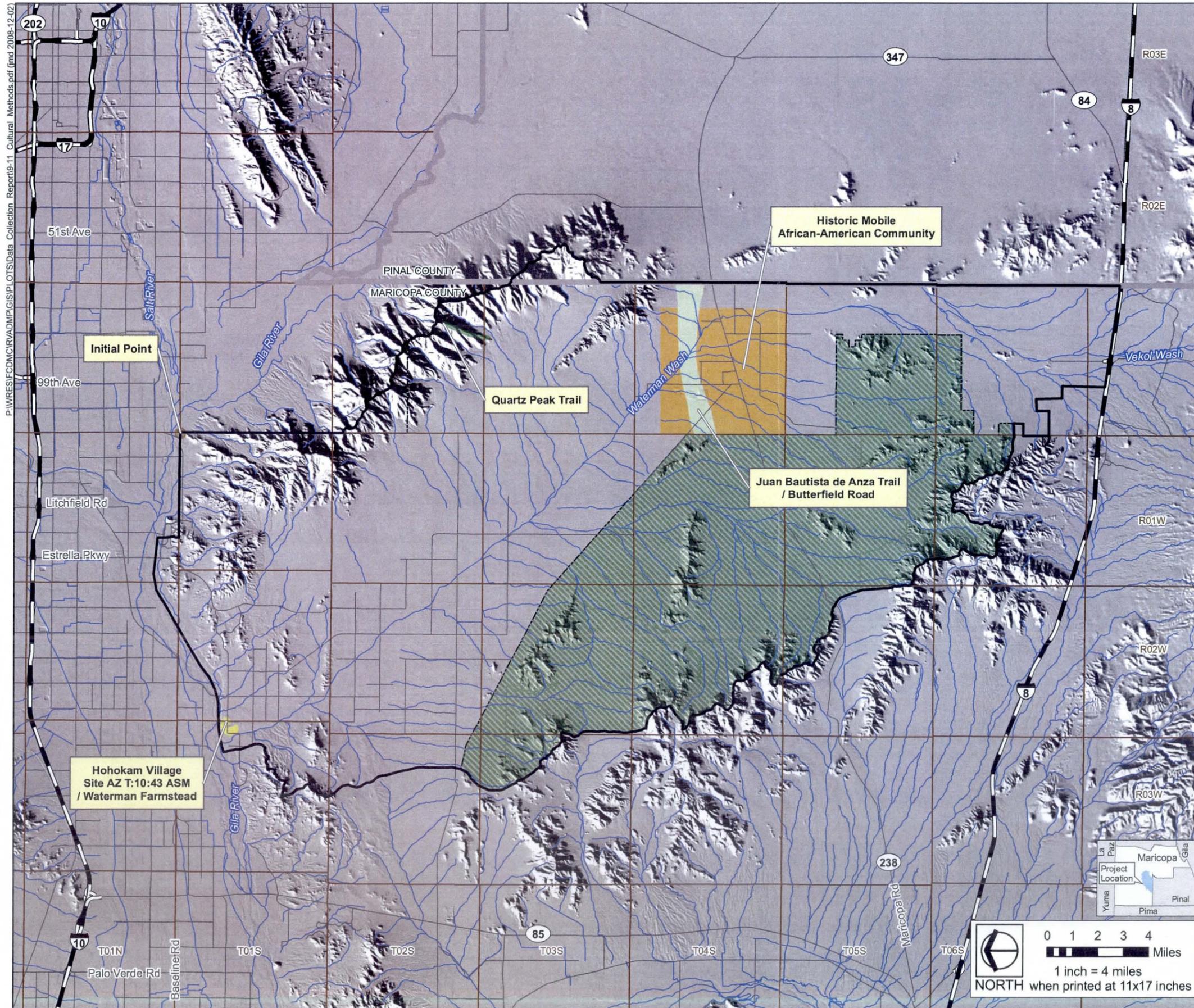


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Rainbow Valley
Area Drainage Master Plan
Compatibility of Flood Protection Methods
with Selected Cultural Resources



Figure 9-11



Project Features

□ Cultural Resource Assessment Area

▨ Sonoran Desert National Monument

Flood Protection Methods Compatibility

■ Compatibility Class 1

■ Compatibility Class 2

■ Compatibility Class 4

■ Compatibility Class 5

■ Compatibility Class 6

■ Not Classified

Reference Features

— County Boundary

— Rainbow Valley ADMP Boundary

— Township and Range Boundary

— Interstate Highway/Freeway

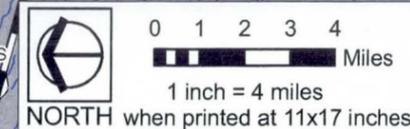
— Major Road

— River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008

URS Corporation
Cultural Resource Data and
Flood Protection Methods Compatibility, 2008

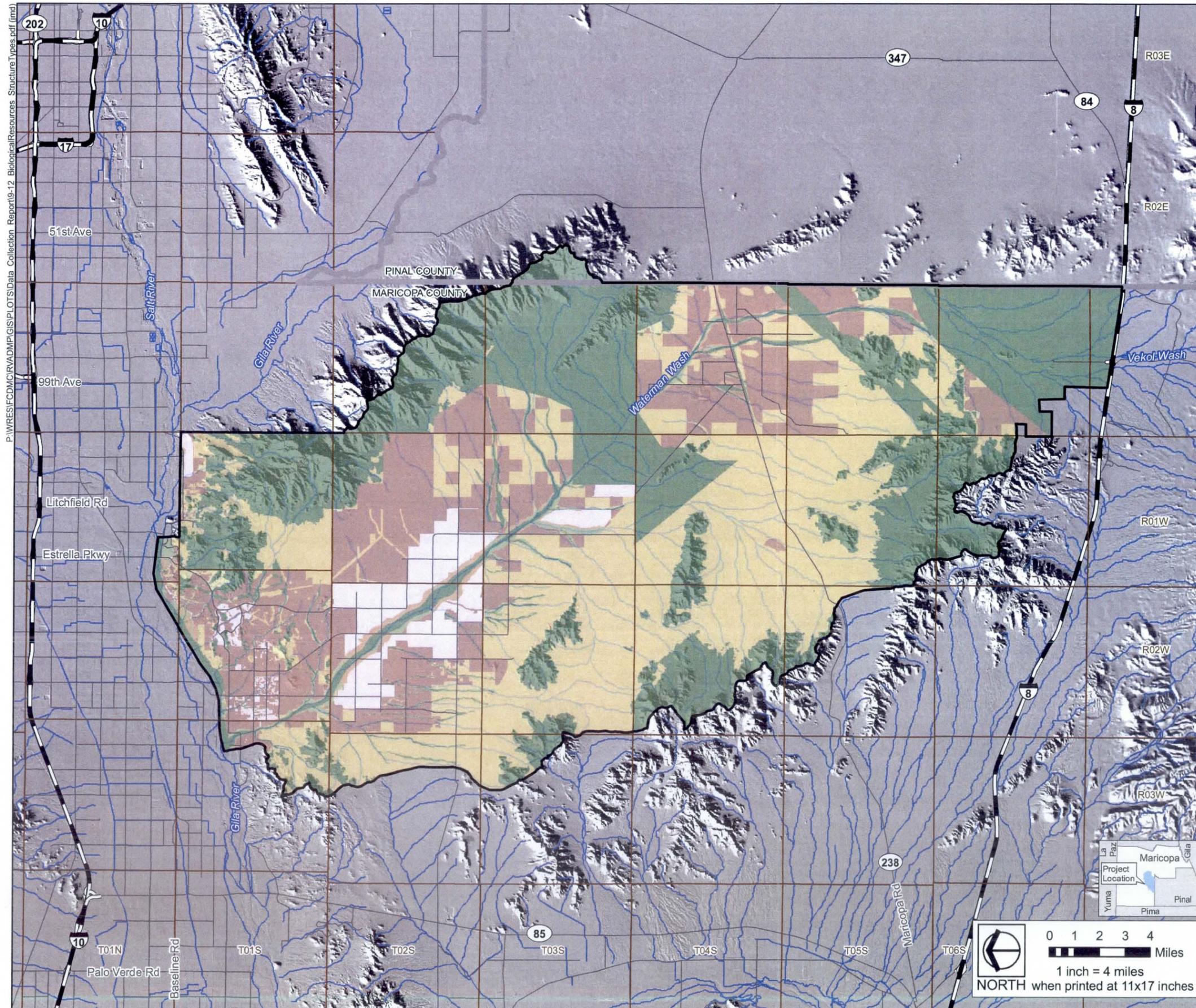


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Rainbow Valley
Area Drainage Master Plan
Ecological Resources
Structure Types Compatibility



Figure 9-12



Project Features

ecological_units

Flood Protection Structure Type Compatibility

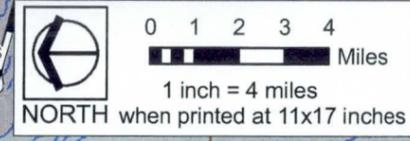
- Class 1
- Classes 1,3,4
- Classes 1,5
- Classes 1,2,5
- Classes 1,3,4,5
- Classes 1,2,3,4,5
- Classes 1,3,4,5,6
- Classes 1,2,3,4,5,6

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
URS Corporation
Structure Type Compatibility, 2008

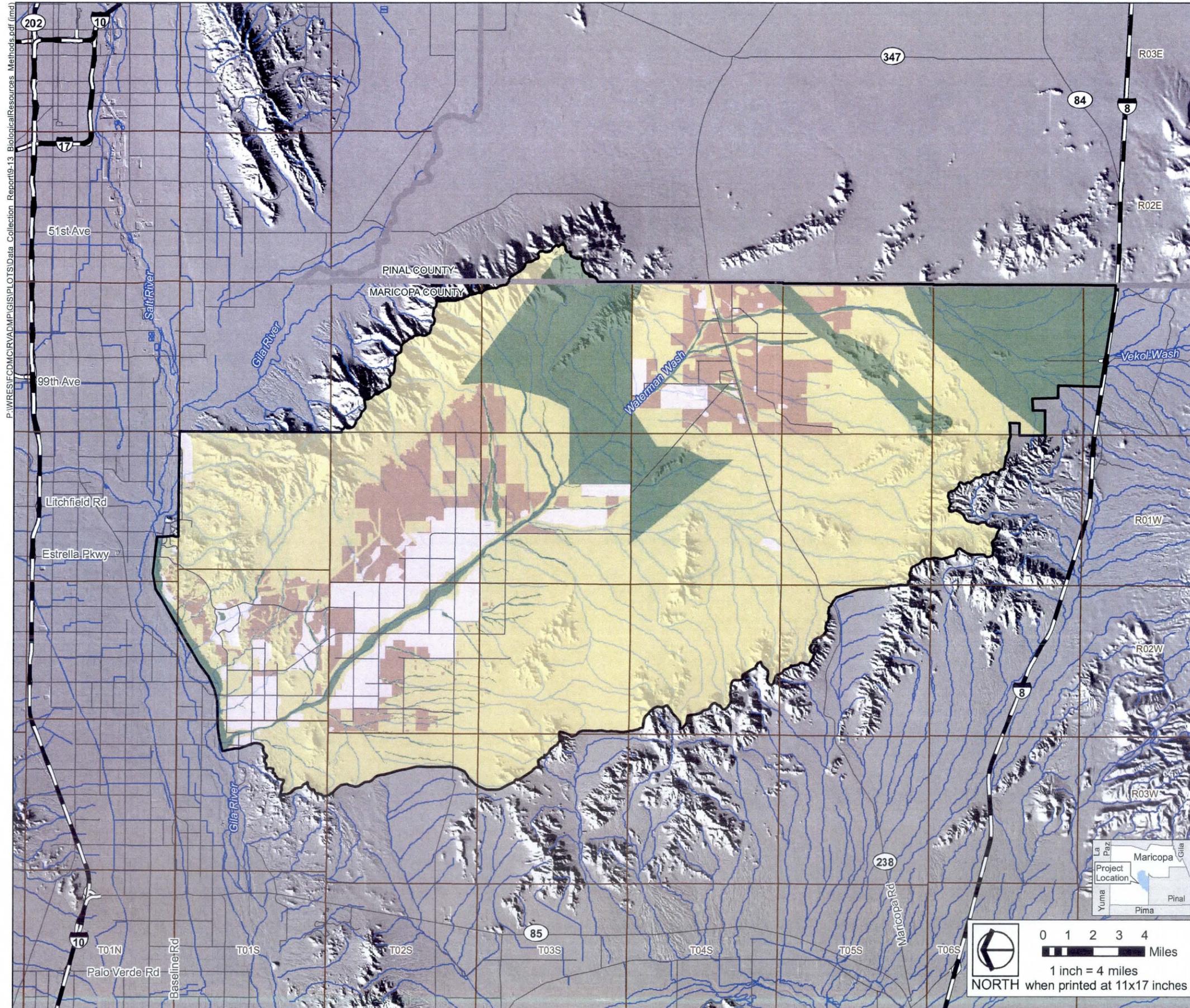


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Rainbow Valley
Area Drainage Master Plan
Ecological Resources
Flood Protection Methods Compatibility



Figure 9-13



Project Features

Flood Protection Methods Compatibility

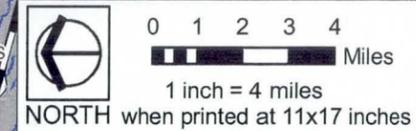
- Class 1
- Class 2
- Class 3
- Class 5

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream Boundary

Data Sources

Flood Control District of Maricopa County
Base Vector and Hillshade Data, 2008
URS Corporation
Flood Protection Methods Compatibility, 2008

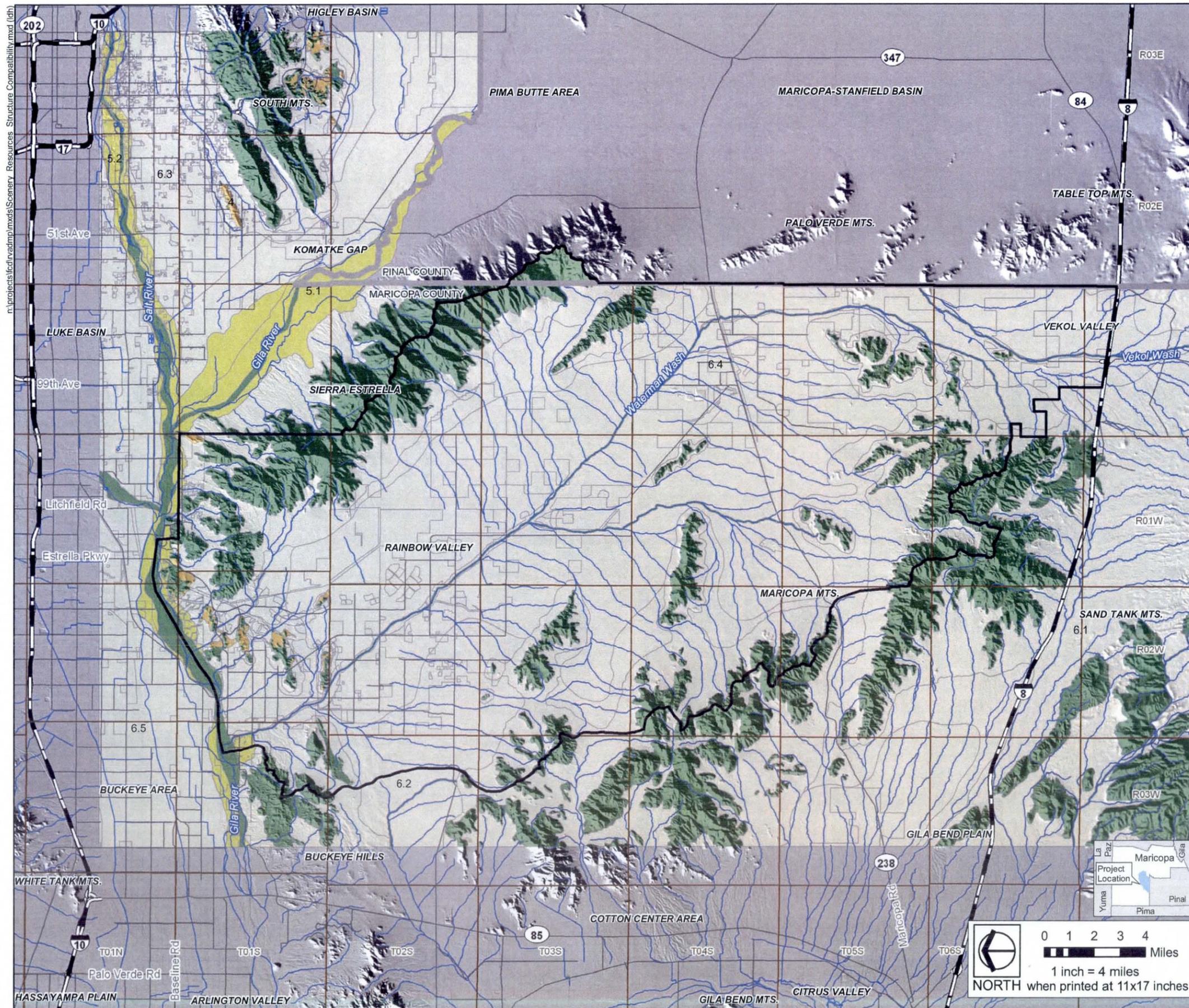


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Rainbow Valley
Area Drainage Master Plan
Scenery Resources
Structure Types Compatibility



Figure 9-14



Project Features

Future Landscape Character Units
Structure Types Compatibility
Classes

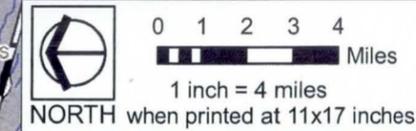
- Compatibility Class 1
- Compatibility Class 4
- Compatibility Class 5
- Compatibility Class 6
- Not Classified

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/
Freeway
- Major Road
- River/Stream

Data Sources

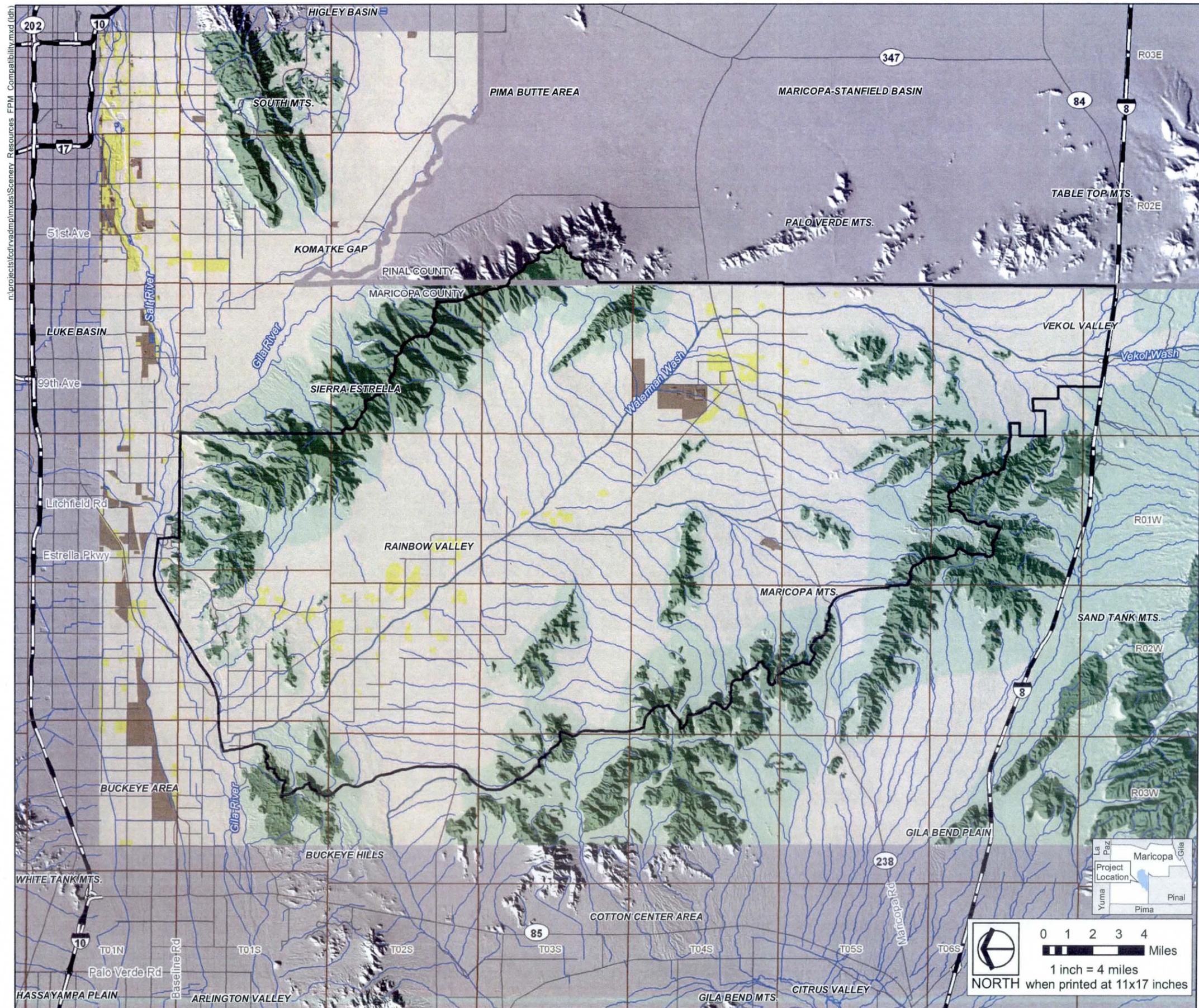
Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA)
Landscape Character Units Structure Types Compatibility Ratings Matrix, 2008
Future Landscape Character Units Map, 2008



Rainbow Valley
Area Drainage Master Plan
Scenery Resources
Flood Protection Methods Compatibility



Figure 9-15



Project Features

Future Landscape Character Units
Flood Protection Methods
Compatibility Classes

- Compatibility Class 1
- Compatibility Class 2
- Compatibility Class 3
- Compatibility Class 4
- Compatibility Class 6
- Not Classified

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
Future Landscape Character Flood Protection Methods Compatibility Ratings Matrix, 2008
Future Landscape Character Units Map, 2008

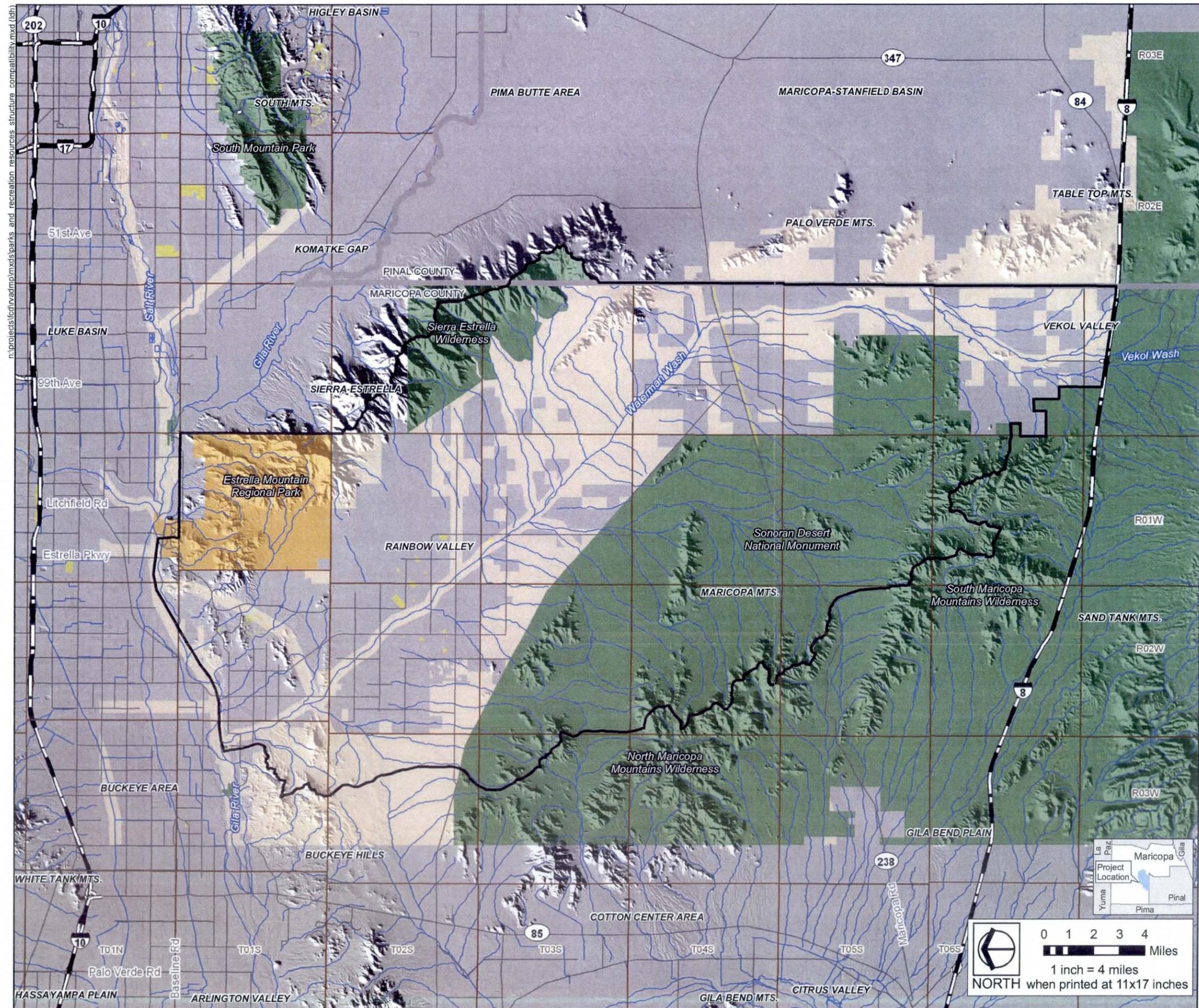
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Rainbow Valley
Area Drainage Master Plan
Parks and Recreation Resources
Structure Types Compatibility



Figure 9-16



Project Features

Parks and Recreation Resources
Structure Types Compatibility

- Compatibility Class 1
- Compatibility Class 4
- Compatibility Class 5
- Compatibility Class 6
- Not Classified

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/
Freeway
- Major Road
- River/Stream

Data Sources

Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
Parks & Recreation Resources Structure Type Compatibility Ratings Matrix, 2008
Parks & Recreation Resources Map, 2008
City of Goodyear
Land Use Plan, 2008

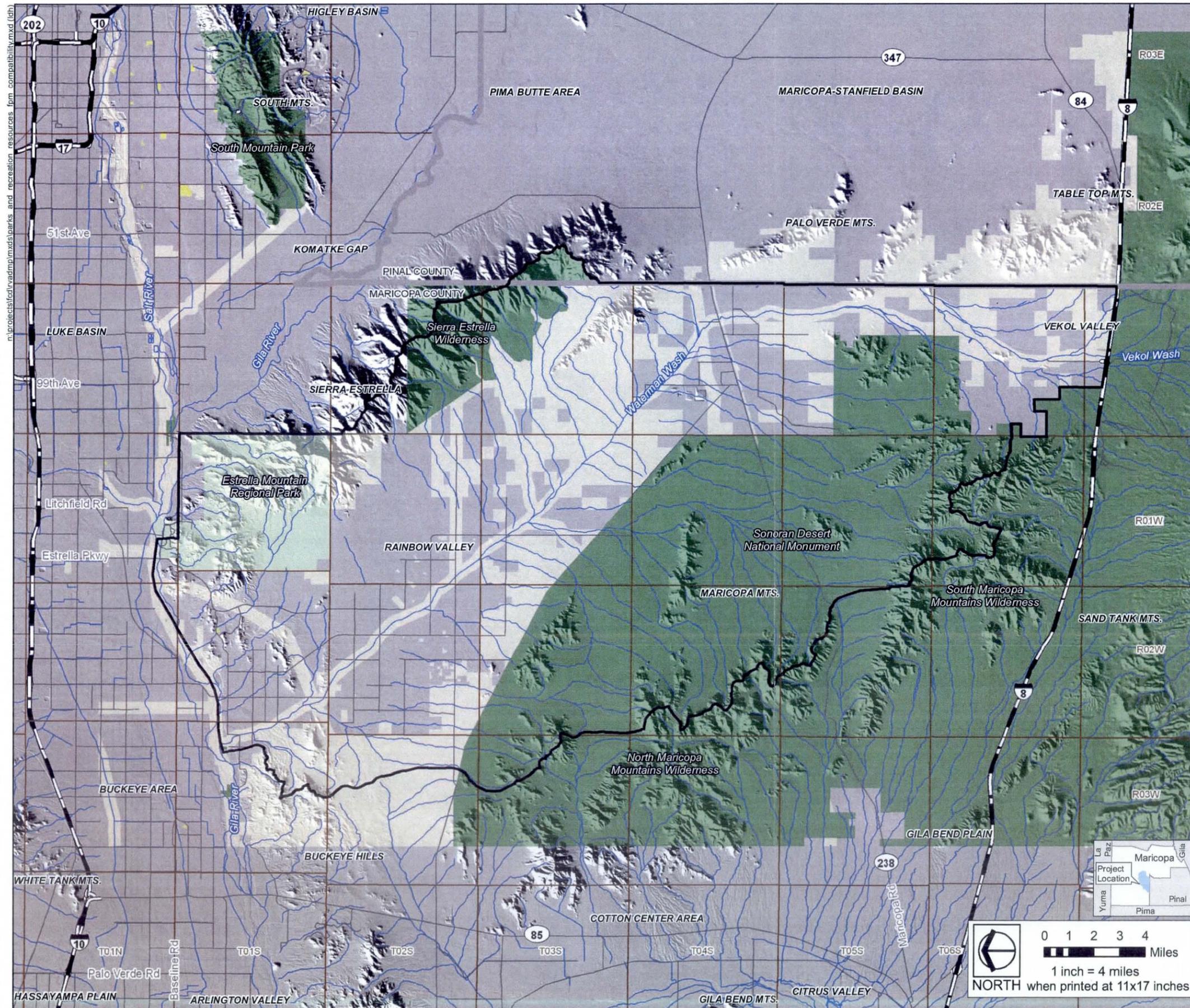
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1 inch = 4 miles
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Rainbow Valley
Area Drainage Master Plan
Parks and Recreation Resources
Flood Protection Methods Compatibility



Figure 9-17



Project Features

**Parks and Recreation Resources
Flood Protection Methods
Compatibility**

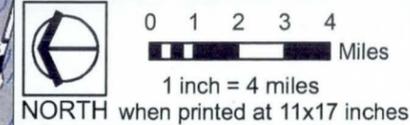
- Compatibility Class 1
- Compatibility Class 2
- Compatibility Class 3
- Compatibility Class 4
- Not Classified

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/
Freeway
- Major Road
- River/Stream

Data Sources

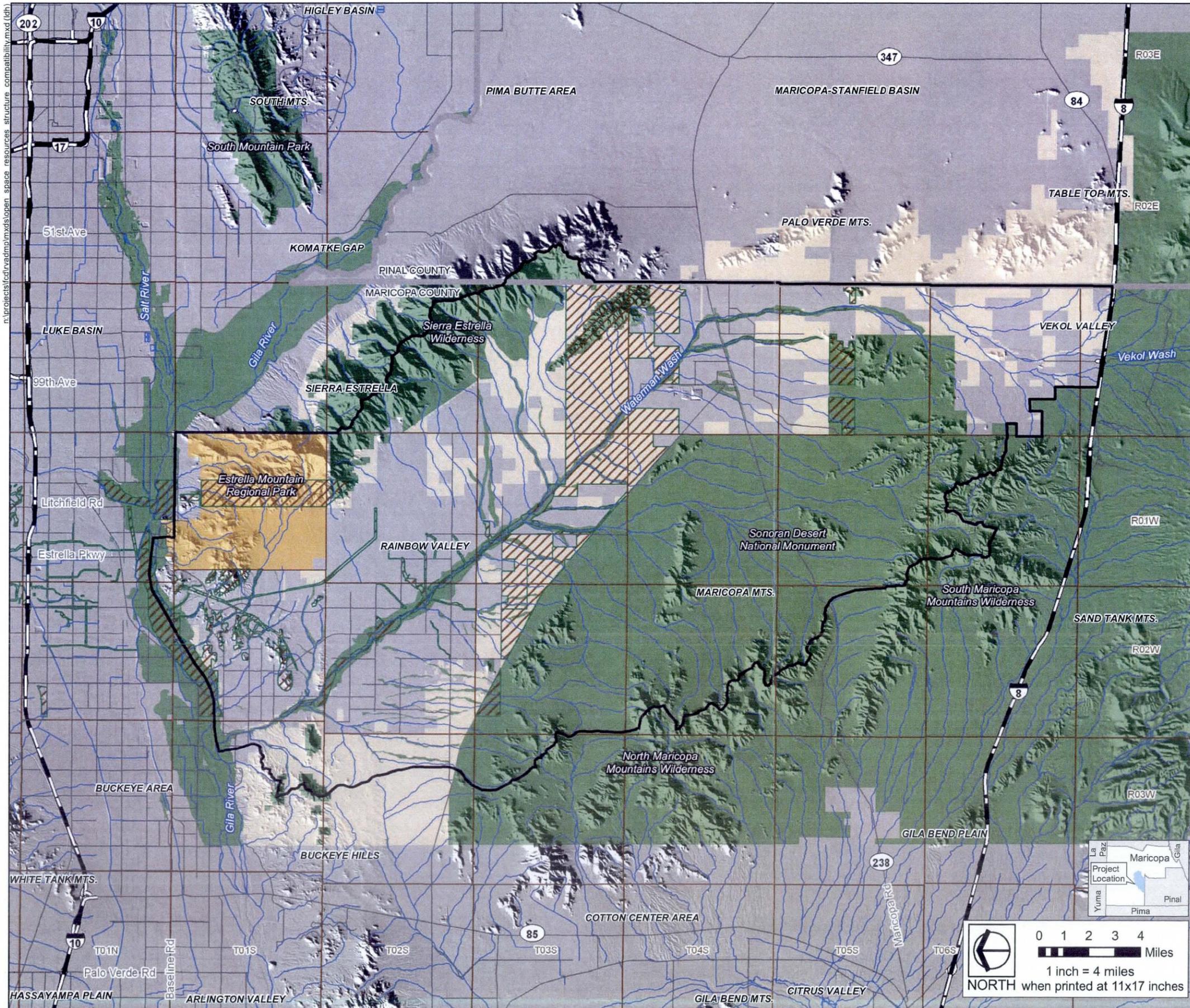
Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
Parks & Recreation Resources Flood Protection Methods Compatibility Ratings Matrix, 2008
Parks & Recreation Resources Map, 2008
City of Goodyear
Land Use Plan, 2008



Rainbow Valley
Area Drainage Master Plan
Open Space Resources
Structure Types Compatibility



Figure 9-18



Project Features

**Open Space Resources
Structure Types Compatibility**

- Compatibility Class 1
- Compatibility Class 4
- Compatibility Class 6
- Not Classified

Other Designations

- City of Goodyear Open Space

NOTE: For open space resources compatibility class ratings, see Table 10.

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/ Freeway
- Major Road
- River/Stream

Data Sources

- Maricopa Association of Governments
- MAG Desert Spaces, 2008
- Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
- Open Space Resources Structure Type Compatibility Ratings Matrix, 2008
- Open Space Resources Map, 2008
- City of Goodyear
- Land Use Plan, 2008

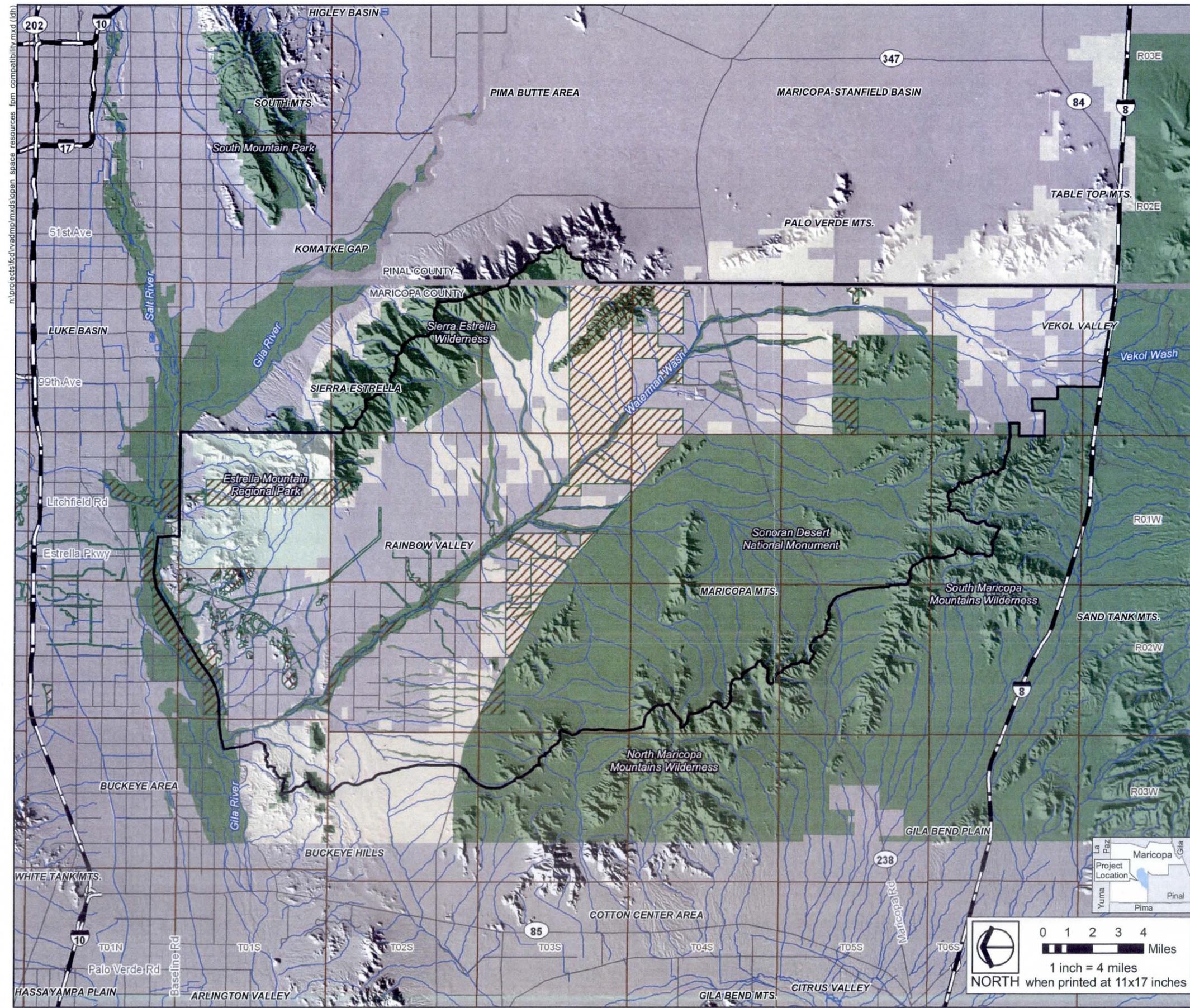
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Miles
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Rainbow Valley
Area Drainage Master Plan
Open Space Resources
Flood Protection Methods Compatibility



Figure 9-19



Project Features

**Open Space Resources
Flood Protection Methods
Compatibility**

- Compatibility Class 1
- Compatibility Class 2
- Compatibility Class 3
- Not Classified

Other Designations

- City of Goodyear Open Space

Reference Features

- County Boundary
- Rainbow Valley
- ADMP Boundary
- Township and Range Boundary
- Interstate Highway/
Freeway
- Major Road
- River/Stream

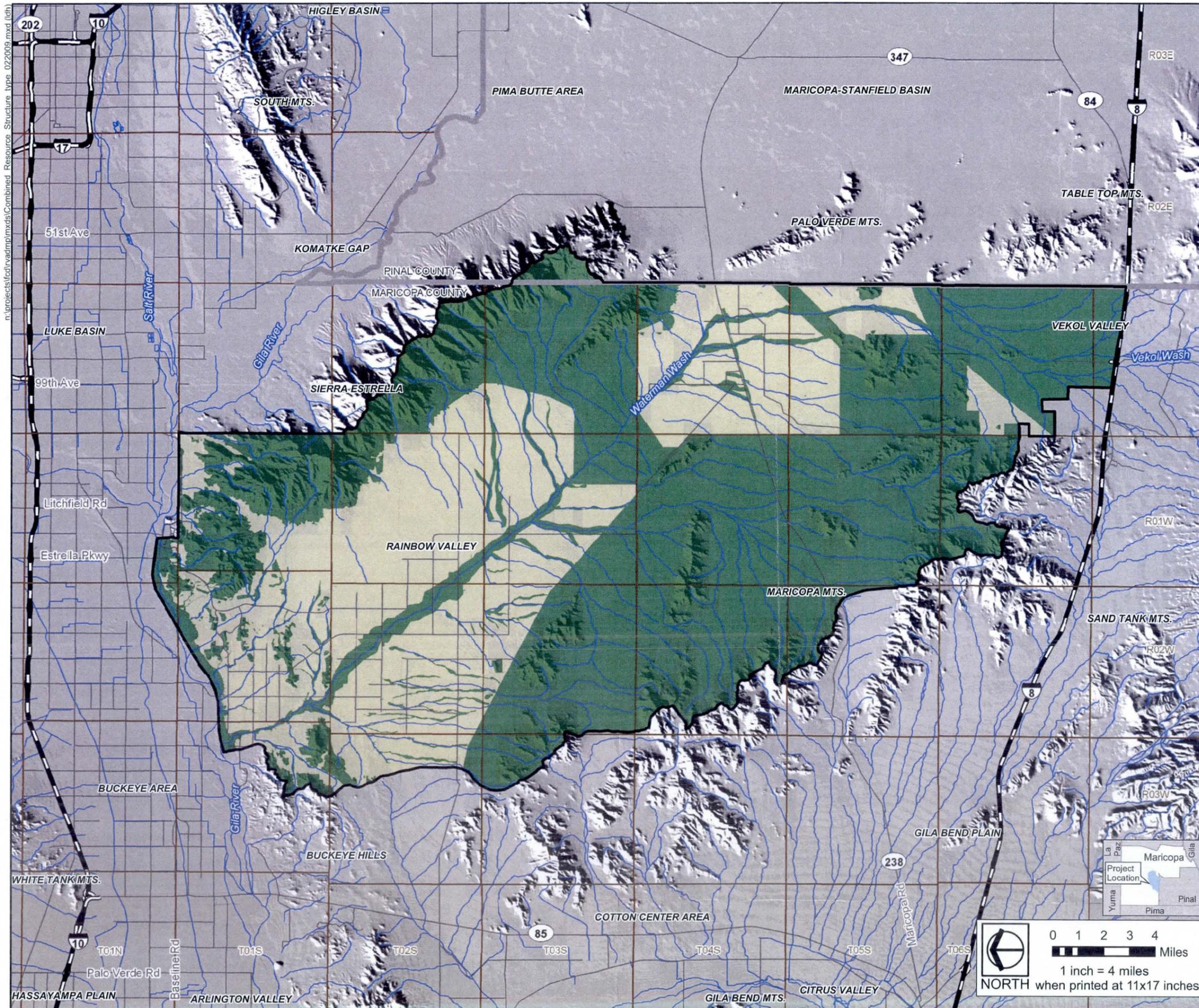
Data Sources

- Maricopa Association of Governments
MAG Desert Spaces, 2000
- Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
- Open Space Resources Structure Types Compatibility Ratings Matrix, 2008
- Open Space Resources Map, 2008
- City of Goodyear
Land Use Plan, 2008

Rainbow Valley
Area Drainage Master Plan
Combined Resource
Structure Types Compatibility



Figure 9-20



Project Features

Combined Structure Types Compatibility

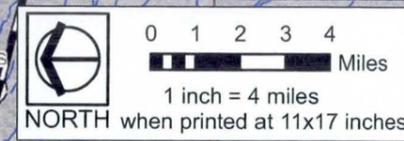
- Compatibility Class 1
- Other - Refer to individual resource flood protection structure type compatibility maps for flood protection planning

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

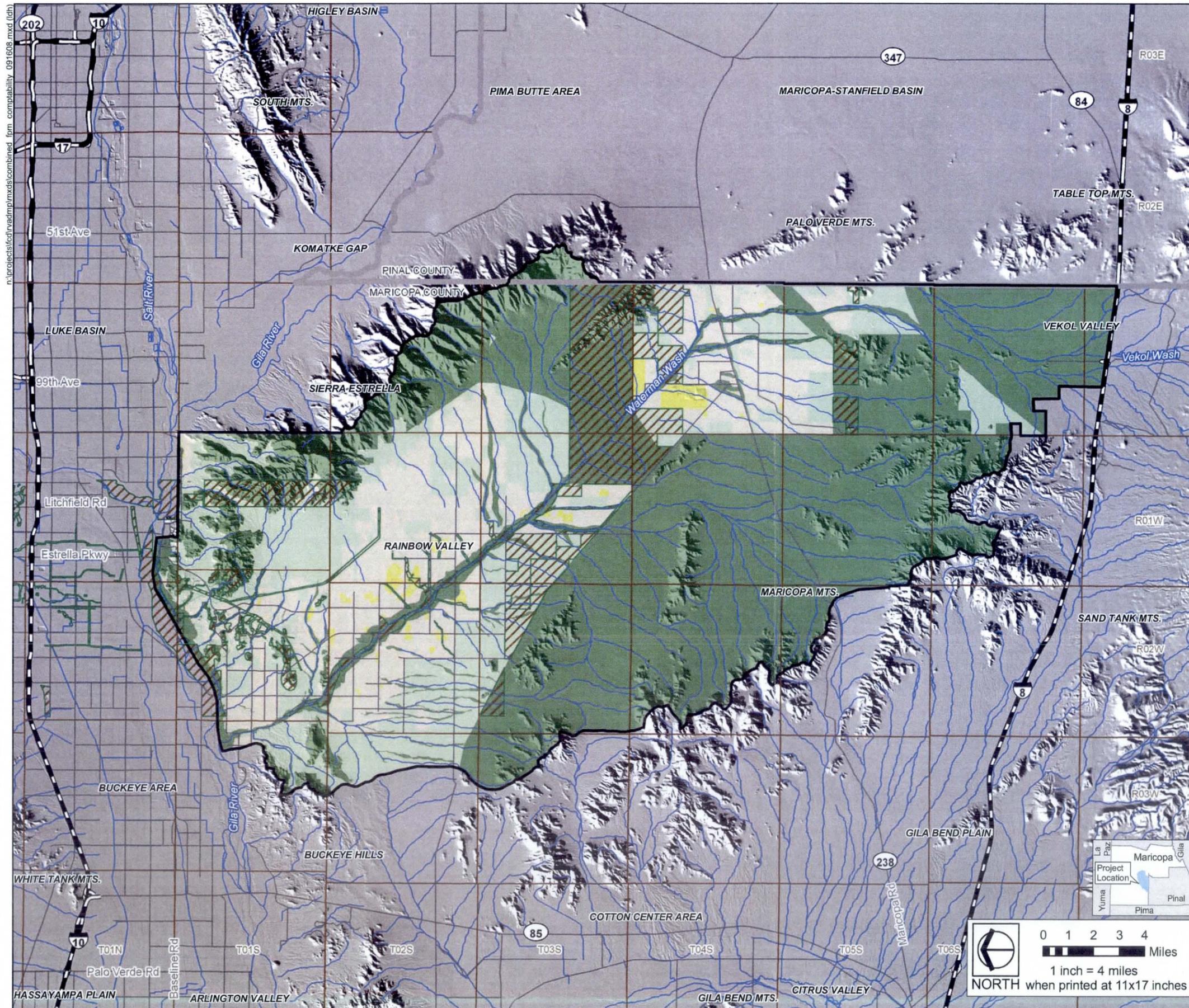
Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
 Landscape Character Units Structure Types Compatibility Map, 2008
 Parks & Recreation Resources Structure Types Compatibility Map, 2008
 Open Space Resources Structure Types Compatibility Map, 2008
 URS Corporation
 Flood Protection Structure Types Compatibility, 2009
 City of Goodyear Land Use Plan, 2008



Rainbow Valley
Area Drainage Master Plan
Combined Resource
Flood Protection Methods Compatibility



Figure 9-21



Project Features

Combined Flood Protection Methods Compatibility

- Compatibility Class 1
- Compatibility Class 2
- Compatibility Class 3
- Compatibility Class 4

Other Designations

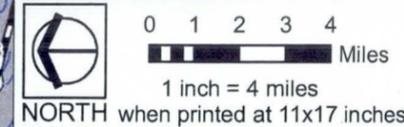
- City of Goodyear Open Space

Reference Features

- County Boundary
- Rainbow Valley ADMP Boundary
- Township and Range Boundary
- Interstate Highway/Freeway
- Major Road
- River/Stream

Data Sources

- Flood Control District of Maricopa County Landscape Inventory & Analysis (LIA), 2008
- Landscape Character Units Flood Protection Methods Map, 2008
- Parks & Recreation Resources Flood Protection Methods Map, 2008
- Open Space Resources Flood Protection Methods Map, 2008
- URS Corporation
- Flood Protection Methods Compatibility, 2009
- City of Goodyear Land Use Plan, 2008



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10.0 REFERENCES

- Anderson, T.W., G.W. Freethey, and P. Tucci. 1992. *Geohydrology and Water Resources of Alluvial Basins in South-Central Arizona and Parts of Adjacent States*. USGS Professional Paper 1406-B, 67 p. May.
- Anning, D.W., N.J. Bauch, S.J. Gerner, M.E. Flynn, S.N. Hamlin, S.J. Moore, D.H. Schaefer, S.K. Anderholm, and L.E. Spangler. 2007. *Dissolved solids in basin-fill aquifers and streams in the Southwestern United States*. USGS Scientific Investigations Report 2006-5315. 168 p.
- Avondale, City of. 2008. *Avondale Now!* (newsletter). Avondale, Arizona: City of Avondale, Development Services. Fall 2008.
- _____. 2002. *General Plan*. Avondale, Arizona: City of Avondale. Available at <http://www.avondale.org/documents/Codes%20&%20Ordinances/General%20Plan/3092-GeneralPlan.pdf> (accessed February 2, 2009).
- Arizona Department of Water Resources. 2008. ADWR Office of Assured Water Supply. OAWS database, and assured and adequate water supply program pending application status.
- _____. 1994. *Arizona water resources assessment, volume II, hydrologic summary*. August.
- Bates, Robert Latimer, and Julia A. Jackson. 1984. *Dictionary of Geological Terms*. Garden City, New York: Anchor Press / Doubleday.
- Beier, P., E. Garding, and D. Majka. 2008. *Arizona Missing Linkages: Gila Bend – Sierra Estrella Linkage Design*. Report to Arizona Game and Fish Department. School of Forestry, Northern Arizona University.
- The Birds of North America (A. Poole, Ed.). 2007. Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online, <http://bna.birds.cornell.edu/bna>.
- Black & Veatch. 2008. *Water Resources, Integrated Master Plan, City of Goodyear, June 2008*. pp. 4-1 – 4-27.
- Brennan, T.C., and A.T. Holycross. 2006. *A Field Guide to Amphibians and Reptiles in Arizona*. Phoenix, Arizona: Arizona Game and Fish Department.

Buckeye, Town of. 2008. Adopted. Town of Buckeye, 2007 General Plan Update. January 18.

Conway, B.D. 2008. *Areas of land subsidence in the Rainbow Valley Sub-Basin based on ADWR EnviSat time-series InSAR data 01/22/2007 to 02/11/2008*: ADWR Hydrology Division Map. Retrieved from:
http://www.azwater.gov/DWR/Content/Find_by_Program/Hydrology/files/InSAR_PDF/.

Corman, Troy E., and Cathryn Wise-Gervais, eds. 2005. *Arizona Breeding Bird Atlas*. Albuquerque, New Mexico: University of New Mexico Press.

Cunningham, D., E. Dewitt, G. Hazel, S.J. Reynolds, and J.E. Spencer. 1987. *Geologic map of the Maricopa Mountains, central Arizona*. AZGS Open File Report 87-4, AZGS, Tucson. 1 sheet, scale 1:62500.

DMJM Harris/AECOM. 2008. Interstate 8 and Interstate 10 Hidden Valley Transportation Framework Study, Working Paper No. 3, Existing and Future Conditions, Prepared for the Maricopa Association of Governments. September.

Engineering and Environmental Consultants, Inc. (EEC). 2006. *Waterman Wash and Tributaries Floodplain Delineation Study*. Vol. 1 of 5. Phoenix, Arizona: EEC. FCD 2002C024. March.

Federal Emergency Management Agency (FEMA). 2002. Guidance for Alluvial Fan Flooding Analyses and Mapping. Appendix G in *Guidelines and Specifications for Flood Hazard Mapping Partners*. February.

Flood Control District of Maricopa County. 2009. *Hydrology*. Vol. I of the *Drainage Design Manual for Maricopa County, Arizona* (draft). Phoenix, Arizona: Flood Control District of Maricopa County. January. Available at <http://www.fcd.maricopa.gov/Pub/Manualsdownloads/Hydrology%20Design%20Manual.pdf> (accessed January 29, 2009).

_____. 2003. *The Preliminary Landscape Character Assessment for Maricopa County*.

Goodyear, City of. 2008. City of Goodyear Land Use Plan (map). April. Available at <http://www.ci.goodyear.az.us/DocumentView.asp?DID=4018> (accessed February 18, 2009).

_____. 2007a. *Integrated Master Plan*.

- _____. 2007b. *Sonoran Valley Planning Area Amendment*. Submitted by RBF Consulting. Goodyear, Arizona: City of Goodyear.
- _____. 2003. *Goodyear General Plan 2003-2013*. Goodyear, Arizona: Community Development Department, Planning and Zoning. Available at <http://www.ci.goodyear.az.us/index.aspx?NID=2173> (accessed February 2, 2009).
- Hjalmarson, H.W. 2003. *Piedmont Flood Hazard Assessment for Flood Plain Management for Maricopa County, Arizona*. Prepared for the Flood Control District of Maricopa County, Arizona.
- Hoffmeister, D.F. 1986. *Mammals of Arizona*. University of Arizona Press, 602pp.
- Maricopa Association of Governments (MAG). 2009. *I-8/I-10 Hidden Valley Transportation Framework Study, Preliminary Framework Recommendation (draft)*. Phoenix, Arizona: Maricopa Association of Governments. February 4.
- _____. 2000. Desert Spaces, Environmentally Sensitive Development Areas (ESDA), Policies & Design Guidelines.
- _____. 1995. MAG Desert Spaces Plan, with map revision for Management Approaches, April 2003.
- Maricopa County. 2002. *Maricopa County Comprehensive Plan: Eye to the Future 2020*. Phoenix, Arizona: Planning and Zoning Commission of Maricopa County.
- Mauz, K. 2004. Sonoran Desert study. *Journal of the Arizona-Nevada Academy of Science* 36(2):95-102.
- Miller, John Frederick, Ralph H. Frederick, and R. J. Tracey. 1973. *Arizona*. Vol. 3 in the *Precipitation-Frequency Atlas of the Western United States*. 2nd ed. Silver Spring, Maryland: U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Weather Service.
- Openheimer, J.M., and J.S. Sumner. 1980. Regional geophysics assessment of southwest alluvial basins: University of Arizona, final report for USGS contract 14-08-001-18228, 50p.
- RBF Consulting. 2008. *Conceptual Corridor Study for Waterman Wash*. Phoenix, Arizona; RBF Consulting. February 25.

_____. 2008. Preliminary Final Draft, Waterman Wash City of Goodyear, Conceptual Corridor Study, Prepared for the City of Goodyear. February 25.

Rascona, S.J. 2005. Maps Showing Groundwater Conditionals in the Phoenix Active Management Area, Maricopa, Pinal and Yavapai Counties, Arizona – November 2002-February 2003. ADWR HMS No. 35. February.

Reynolds, S.J., and S.J. Skotnicki. 1993. Geologic Map of the Phoenix South 30' x 60' Quadrangle, Central Arizona, AZGS OFR-93-18, scale 1:100,000.

Richard, S.M., T.C. Shipman, L.C. Greene, and R.C. Harris. 2007. Estimated Depth to Bedrock in Arizona. AZGS Digital Geologic Map (DGM) 52, v 1.0.

Rodgers, James B. 2008. *An Archeological Resource Overview of the Rainbow Valley Area Drainage master Plan Region of South-Central Maricopa County, Arizona*. Contract Archeological Series 08-3. Phoenix, Arizona: Scientific Archeological Services.

Ruediger and Lloyd. 2003.

Skotnicki, S.J. 2002. Geologic Map and Report for the Buckeye 7.5' Quadrangle, Maricopa County, Arizona, v. 1.0. AZGS DGM-15.

Stulik, R.S. 1982. Maps Showing Ground-water Conditions in the Waterman Wash Area, Maricopa and Pinal Counties, Arizona – 1982. ADWR HMS No. 8.

URS Corporation (URS). 2009. *Cultural resource Assessment for the Rainbow Valley Area Drainage Master Plan, Maricopa County, Arizona* (draft). Phoenix, Arizona: URS. December 16.

_____. 2008a. *Initial Hydrology Memorandum*. Submitted to the Flood Control District of Maricopa County. Phoenix, Arizona: URS. October.

_____. 2008b. Technical Memorandum from Burke Lokey, Flood Control District of Maricopa County, to Elliot Silverston, URS, Regarding the Results of the Vekol Valley Breakout Evaluation. October 1.

U.S. Geological Survey (USGS) National Gap Analysis Program. 2004. Provisional Digital Landcover Map for the Southwestern United States. Version 1.0. Logan, Utah: RS/GIS Laboratory, College of Natural Resources, Utah State University.

11.0 DATA COLLECTION LOG



Table 11-1 Data Collection Log

File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Policy for the Aesthetic Treatment of Landscaping of Flood Control Projects North Valley Existing Facilities Landscape Aesthetics and Multi-Use Opportunities Assessment	Hard copy	N/A	N/A	5/1/2008	Lokey	N/A	Hardcopy located in bottom drawer near Elliot's office	N/A
West Valley Existing Facilities Landscape Aesthetics and Multi-Use Opportunities Assessment	Hard copy	N/A	N/A	5/1/2008	Lokey	N/A	Hardcopy located in bottom drawer near Elliot's office	N/A
Aesthetic & Multi-use Design Guidelines for Flood Control Basins and Channels Report	Hard copy	N/A	N/A	5/1/2008	Lokey	N/A	Hardcopy located in bottom drawer near Elliot's office	N/A
Additional documentation containing descriptions and photos examples of flood protection structure types, methods and landscape design themes as needed for the study	Hard copy	N/A	N/A	5/1/2008	Lokey	N/A	Hardcopy located in bottom drawer near Elliot's office	N/A
A check list for evaluating Impacts to wildlife Movement Corridors 1952. Beier, Paul, and Low, Steve, in Wildlife Society Bulletin (20:434-44-)	Hard copy	N/A	N/A	5/1/2008	Lokey	N/A	Hardcopy located in bottom drawer near Elliot's office	N/A
MAG Open Space Plan	Hard copy	N/A	N/A	5/1/2008	Lokey	N/A	Hardcopy located in bottom drawer near Elliot's office	N/A
1FOOT_MrSIDs	SID	No	SDW	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\Aerials\0607_Orthos\	912 MrSid images. In increments of 5 -	No - covers old RVADMP boundary
1FOOT_MrSIDs	SDW	No	SDW	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\Aerials\0607_Orthos\	912 SDW files	N/A
1FOOT_MrSIDs	SID	No	SDW	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\Aerials\0708_Orthos	407 MrSid images	No - many missing
1FOOT_MrSIDs	SDW	No	SDW	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\Aerials\0708_Orthos	407 SDW images	N/A
A126_908FloodConditionsAlongSaltRiver_MaricopaCounty_Arizona.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents	Document on flood conditions along the Salt River in Maricopa County from 1959	N/A
TrailPlan.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents	Maricopa County Regional Trail System Plan (Adopted 16-2004)	N/A
Flood Control Structure Types Rev 12-02-07.doc	DOC	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment	(2nd digital copy received) Document by D. Holcomb. Flood Control Structure Types Preliminary Identification for Use in Landscape Compatibility Analyses for Planning Studies	N/A
Flood Control Structure Types Rev 12-02-07.doc	DOC	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment	Document by D. Holcomb. Flood Control Structure Types Preliminary Identification for Use in Landscape Compatibility Analyses for Planning Studies	N/A
1 Landscape Character Types 250000.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	Landscape Character type county overview. 1:250K	N/A
2 Landscape Character Subtypes 250000.mxd	MXD	N/A	N/A	5/2/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	Landscape Character sub-type county overview. 1:250K	N/A
10 Landscape Variety Class 250000.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	Landscape variety class county overview. 1:250K	N/A
12 Open Space Resources 250000.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	open space resources county overview. 1:250K	N/A
14 Parks & Recreation Resources 250000.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	Parks & open space Resources 1:250K	N/A
15 Parks and Recreation Compatibility 250000.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	Parks & recreation resources Flood protection methods Compatibility 1:250K	N/A
23 Travelways Visual Sensitivity 250000.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\2007_and_2008_mxd\County_Wide	Primary Travelways Visual Sensitivity Levels 1:250K	N/A
streams.lyr	layer	No	N/A	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Symbol for streams.shp	No - clipped to county
char_type	coverage	No	No	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Region line is not built	No - clipped to county
studyarea	coverage	No	No	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Study area boundary	Yes
Lakes.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Includes NW Maricopa County + Rosevelt Lake	N/A

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
New_202.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Part of SR 202	N/A
panels.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Used in landscape maps in legened (mini data frames)	Yes
recreation_trails.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Attributed trails in Maricopa County with some outliers	No - clipped to county
stream_labels.shp	SHP	No	No	5/2/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Statewide. Has mile marks and some names	Yes
streams.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Clipped to Maricop county and Santan Mountains	No - clipped to county
travelways.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Arterial roads clipped to Maricopa County with a few outliers	Yes (clipped to county)
cnty	coverage	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Maricopa County boundary	N/A
counties	coverage	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Arizona counties (all)	Yes
panels	coverage	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Used in landscape maps in legened (mini data frames)	Yes
250road_labels.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Same as Arterial1.shp but without highways	No
arterial.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Arterial Roads in Maricopa County and extending into adjoining counties.	Yes
arterial1.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Arterial roads clipped to Maricopa Count (except for some higways). Similar to 250road_labels.hp	No
canal_label.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Canals in Maricopa county	No - outside project area
counties_polygon	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly County boundary (all)	Yes
demcon_200ft.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Elevation Contours 200 ft interval	Yes
hs_100ft	grid	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Hillshade. Clipped box includes Maricopa county +17 miles. 100ft pixels	Yes
hs_100ft_c	grid	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Hillshade. Clipped to Maricopa County. 100ft pixels	No - clipped to county
hscnty_50ft_c	grid	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Hillshade. Clipped to Maricopa County but stops along T. 07 S. 50ft pixels	No - clipped to county
maricopa.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Maricopa County boundary	N/A
maricopa_santan_mountains.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Maricopa County and Santan Mtns	N/A
Maricopa_Streams_Polygons.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Poly Streams in Maricopa county & santan Mountains	No - clipped to county
MaricopaTrails.shp	SHP	No	Yes 2	5/2/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Line Clipped to Maricopa County with a few outliers	Yes

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
hillshade2	grid	No	Yes 3	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base	Hillshade. Covers Arizona. 250ft pixels	Yes
Structure Types and Scale Sub-Classes Conversion Table	XLS	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Excel_Tables	1 tab. Landscape Table 2 - Structure Types and Scale Sub-Classes Conversion Table	N/A
Flood_Protection_Methods_Compatibility_Ratings_Matrix_2008.xls	XLS	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Excel_Tables	3 tabs. Landscape_Character_Units (Landscape Character Flood Protection Methods Compatibility), Parks & Recreation (Parks & Recreation Resources Flood Protection Methods Compatibility), and Open_Space (Open Space Resources Flood Protection Methods Compatibility)	N/A
MAG_Reclass_Table.xls	XLS	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Excel_Tables	3 tabs. LUCODE 2005 DETAIL (DRAFT MAG Land Use Classification 2005), and LDC 2005 for mapping, and Sheet1 (same/similar to LDC 2005 form mapping tab)	N/A
Structure_Types_Compatibility_Ratings_Matrix.xls	XLS	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Excel_Tables	4 tabs. Sheet2 (combines other 3 tabs), Landscape_Character_Units (Landscape Character Compatibility Ratings For Structure Types), Parks & Recreation (Parks & Recreation Resources Compatibility Ratings For Structure Types) and Open_Space (Open Space Resources Compatibility Ratings For Structure Types)	N/A
char_type_in.shp	layer	Yes	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Line. Clipped to Maricop County. Does not intersect project boundary	N/A
lnf_in_full.lyr	layer	Yes	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Line.	N/A
ex_metarea	coverage	Yes	No	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. This data set delineates the Existing Phoenix Metropolitan area.	N/A
az_char_type	coverage	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Statewide	Yes
char_subtype	coverage	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns	Yes
ex_settings	coverage	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns. Very Detailed. Delineates the Existing Cultural Settings within Maricopa County based on a Reclassification of the MAG EXLU04	No - clipped to county
fut_metarea	coverage	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Document on flood conditions along the Salt River in Maricopa County from 1959.	Yes
char_physdiv07.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns. Physical setting boundaries	Yes
char_subtype.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
char_type.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
char_type_in.lyr	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Line. Clipped to Maricop County. Does not intersect project boundary	N/A
ex_comp1.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
ex_comp1ospr.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
ex_lcu.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
ex_ospr.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
fcd_lvc.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes

Table 11-1 Data Collection Log

File Name	Format	Metadata	_prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
fcd_vsl_minus_Erase.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County with a hole and few outliers	Yes
fut_comp1.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	Yes
fut_comp1ospr.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	Yes
fut_ospr.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	Yes
tnf.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Tonto National Forest (TNF) clipped to Maricopa boundary	N/A
tnf_carto.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Tonto National Forest clipped to Maricopa boundary	N/A
tnf_vsl_plus.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Tonto National Forest clipped to Maricopa boundary	N/A
floodplainfcd.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	Yes
floodplainfcd_w_changes.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	Yes
floodplainfema.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	No
floodplainfema_w_changes.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Clipped to Maricopa County	Yes
Future_LC_Units.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
Figure_Settings.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
GilaFloodProneMC_Clip.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Projection incorrect. (Shows up in Utah)	Yes
Physical_Settings_Stream_Polygons.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Maricopa County and Santan Mtns.	Yes
tnf_poly_full.shp	SHP	Yes	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Poly. Projection incorrect. (Shows up in Utah)	N/A
tnf_in_full.shp	SHP	Yes	Yes 4	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final	Line. Entire TNF boundary	N/A
open_spaces_with_BLM_floodplains_merged.lyr	layer	N/A	N/A	5/4/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Statewide	Yes
open_spaces_with_BLM.shp	SHP	No	No	5/3/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Statewide	Yes
recreation_open_spaces.shp	SHP	No	No	5/6/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Statewide	Yes
recreation_with_BLM.shp	SHP	No	No	5/7/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Statewide	Yes
open_spaces_with_BLM_floodplains_merged.shp	SHP	No	Yes 2	5/5/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Statewide	Yes

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Tonto_open_spaces_with_BLM.shp	SHP	No	Yes 2	5/7/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Full TNF boundary	N/A
Tonto_Recreation_with_BLM.shp	SHP	No	Yes 2	5/8/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\open space	Poly. Full TNF boundary	N/A
Rainbow_Valley_Planned_Cultural_Settings.shp	SHP	No	Yes 2	5/2/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\final\Rainbow_Valley	Poly. Extent is Maricopa County plus some areas in Pinal	Yes
nor_dxf	coverage	No	Yes 5	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Legend	Poly. North Arrow (projected shows up in Sonora)	N/A
Combined_Flood_protection_methods_compatibility.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Composite_Parks_&_Open_Space_Inventory_Units_Structure_Types_Compatibility_Merge.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Future_Landscape_Character_Cultural_settings.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Future_Landscape_Character_Structure_Types_Compatibility_Sub_Classes.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Future_Landscape_Character_Units.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Future_Landscape_Character_Units_Compatibility.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Future_Landuse_Map.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Landscape_Character_Physical_Settings.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Open_Space_Resources.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Open_Space_Resources_FPM_Compatibility.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Open_Space_Structure_Type_Compatibility.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Parks_&_Recreation_Resources.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Parks_&_Recreation_Resources_FPM_Compatibility.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Parks_&_Recreation_Structure_Types_Compatibility.mxd	MXD	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds\Rainbow_Valley	Map shows Rainbow Valley Area Only	N/A
Acreage_Cultural_Settings.dbf	DBF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Acre table	N/A
Summary_of_LCU.dbf	DBF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	DBF table (feature count)	N/A
Recreation_Open_Spaces_Inventory_clip.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly. Clipped to project Area	Yes
Recreation_Resources_Clip.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly. Clipped to project Area	Yes

Table 11-1 Data Collection Log

File Name	Format	Metadata	pr file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Structure_Type_Comp_Recreation.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Structure_Type_Comp_Recreation_MERGE.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
LC_Units_Clip.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Phycial_Settings_Clip.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area. Shapafilename probably s/b Physical_Settings_clip.shp	Yes
Streams_Clip	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Line Clipped to project Area	No
ALRIS_Rainbow_Valley_Clip.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Line Clipped to project area	No
clip.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Rainbow Valley Area clip box.	Yes
Cultural_Settings_Clip.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Femaifloodplains_Clip_RV.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
floodplaintfd_clip_RV.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
LC_Ulints_Rainbow_Valley.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
LC_Units_Structure_Compatibility_Merge.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Open_Space_Resources_Floodplains_clip.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Open_Space_Resources_Floodplain_Structure_Merge.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Open_Space_Resources_Floodplains_Structure_Type.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Physical_Settings_with_Buffer_Washes.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
RV_ADMP_Cultural_Settings_Clip_4_Acreage.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
Stream_Polygons.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\Rainbow_Valley_Clip	Poly Clipped to project Area	Yes
hs_100ft	hillshade	No	Yes 1	5/12/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source	Grid Maricopa County Box 100 ft pixels	Yes
hs_100ft_c	hillshade	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source	Grid Northern Maricopa County 100 ft pixel	No - clipped to county
hscnty_50ft_c	hillshade	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source	Grid Northern Maricopa County 50 ft pixel	No - clipped to county
ags_physiogra.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shapes	Poly Statewide	Yes

Table 11-1 Data Collection Log

File Name	Format	Metadata	pr file	Date Received	Sant By	Network Location	Notes	Extent Covers Proj Area
canals.shp	SHP	No	No	5/3/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line A couple features are corrupt. Countywide with some outliers	Yes
dams.shp	SHP	No	No	5/5/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Northern half of Maricopa County and a bit in Pinal	N/A
hydro.shp	SHP	No	No	5/7/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Statewide	Yes
lake.shp	SHP	No	No	5/8/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Poly NW Maricopa County	N/A (no lakes in RVADMP)
cnty_50ft.shp	SHP	No	Yes 1	5/4/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Countywide 50 ft contours	Yes
demcon_200ft.shp	SHP	No	Yes 1	5/6/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Clipped box around Maricopa County 200 ft contours	Yes
street.shp	SHP	No	Yes 1	5/10/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Central Arizona	Yes
trails_all_parts_public.shp	SHP	No	Yes 1	5/11/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Maricopa County	Yes
arterial.shp	SHP	No	Yes 2	5/2/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Line Maricopa County with some outliers	Yes
Santan_Mountains.shp	SHP	No	Yes 2	5/9/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes	Poly	N/A
ALRIS_indian.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes\Landuse_Map_Sources	Poly Statewide	Yes
stateInd.shp	SHP	Yes	Yes 6	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_C\haracter_Assessment\source\shapes\Landuse_Map_Sources	Poly Statewide	Yes
Appendix A Linkage Data Sheet.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 2 pages	N/A
Appendix B Workshop Participants.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 4 pages	N/A
Arizona's Wildlife Linkages Assessment.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 22 pages	N/A
Arizona's Wildlife Linkages Map version1.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 map	N/A
references.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 8 pages	N/A
Section I Introduction.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 4 pages	N/A
Section II Arizona Wildlife Linkages Workgroup.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 2 pages	N/A
Section III Arizona's Missing Linkages Workshop.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 8 pages	N/A
Section IV Arizona's Wildlife Linkages Mapping.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 2 pages	N/A
Section V Arizona's Wildlife Linkages Prioritization.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 4 pages	N/A
Section VII Potential Linkage Zones.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 106 pages	N/A
Section VIII Riparian Habitat Linkage Zones.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 20 pages	N/A

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Section IX Future Directions.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 4 pages	N/A
Section X Connectivity Related Projects.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 4 pages	N/A
Section XI Contributor's Connectivity Efforts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 4 pages	N/A
Section XII Sources for Connectivity Resolution.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006	11x17 18 pages	N/A
Figure 6-1 Arizona's Wildlife Linkages.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-2 Arizona's Wildlife Linkages Across Habitat Blocks.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-3 Arizona's Fracture Zones.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-4 Arizona's Biotic Communities.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-5 Landownership.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-6 Tribal Nations.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-7 USDA Forest Service.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-8 Department of Defense.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-9 Arizona's Highway System with County Boundaries.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-10 ADOT Engineering Districts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-11 ADOT Maintenance Districts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-12 ADOT Natural Resources Management Group.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-13 Arizona Game and Fish Department.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-14 Bureau of Land Management Districts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-15 Bureau of Land Management Field Offices.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-16 Congressional Districts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-17 Council of Governments.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-18 Federal Highway Administration Engineering Districts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A
Figure 6-19 Legislative Districts.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP ICSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11X17 Map	N/A

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Section VI Arizona's Wildlife Linkages.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\Arizona Wildlife Linkages Assessment 2006\Section VI	11x17 1 page pamphlet	N/A
elriobase hyd.zip	ZIP	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	Zip containing misc data	N/A
elriobase1det.zip	ZIP	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	Zip containing misc data	N/A
elrioscenarios.zip	ZIP	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	Zip containing misc data	N/A
Appendix D EI Rio Hydrographs.xls	XLS	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	19 Hydrographs (19 tabs)	N/A
Alternative Sediment Analysis Master.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	177 pages	N/A
Appendix B All 55 wells.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	327 pages	N/A
Appendix C GW elev.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	104 pages	N/A
Appendix D EI Rio Hydrographs.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	10 pages	N/A
Book 1 Sediment Master.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	350 pages	N/A
CONCEPT_arial.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	1 sheet, 100x36	N/A
Data Collection.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	100 pages	N/A
EI Rio GW Final wfigures.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	120 pages	N/A
EI Rio Overview Document	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	38 pages	N/A
Environmental Resources.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	333 pages	N/A
Executive Summary.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	2 pages	N/A
Final Cover.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	1 page	N/A
Final Report - For 4-17-06 - Final.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	224 pages	N/A
H&H Memos.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	112 pages	N/A
Planning Analysis.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	42 pages	N/A
figure&.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan	Report Figures. Figure2-1 - Figure2-4; Figure3-1 - Figure3-4; Figure4-1 - Figure4-4; Figure5-1 - Figure5-4; Figure6-1 - Figure6-4; Figure7&8; Figure9&10; Figure11; Figure12-1 - Figure12-4; Figure13; Figure 14	N/A
ehz_final.shp	SHP	Yes	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan\EIRio_LMAR\GIS\IEHZ	Poly. Clipped to north of project area	N/A
active_*.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan\EIRio_LMAR\GIS\Historical	Line 15 shapefiles. * refers to date - 1937, 1949, 1958, 1964, 1971, 1977-1979, 1983, 1985, 1986, 1992, 1993, 1997, 2002	N/A
compound_*.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan\EIRio_LMAR\GIS\Historical	Line 15 shapefiles. * refers to date - 1937, 1949, 1958, 1964, 1971, 1977-1979, 1983, 1985, 1986, 1992, 1993, 1997, 2002	N/A
thalweg_*.shp	SHP	No	Yes 3	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan\EIRio_LMAR\GIS\Historical	Line 15 shapefiles. * refers to date - 1937, 1949, 1958, 1964, 1971, 1977-1979, 1983, 1985, 1986, 1992, 1993, 1997, 2002	N/A
Appendix Companion Book.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\EI Rio Watercourse Master Plan\EIRio_LMAR\report	11x17 151 pages EI Rio Watercourse Master Plan Lateral Migration Analysis Report Appendix Companion Book	N/A

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Ei Rio LMAR final.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\EI Rio LMAR\report	8.5x11 163 pages EI Rio Watercourse Master Plan Lateral Migration Analysis Report	N/A
boundarybuckeyelines.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. Partial boundary of buckeye	N/A
boundarygoodyearavondale.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. Goodyear, Avondale boundaries	N/A
buck_fire_reveg.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. NW of project boundary	N/A
bwcd_features.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. NE of project boundary	N/A
corridor.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. NW of project boundary	N/A
educationpod.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Point. NE of project boundary	N/A
emptyacres.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. NW of project boundary	N/A
estrella_trails.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. NE along project boundary	N/A
estrellpark070903.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. NE along project boundary	N/A
final oa.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. North of project boundary	N/A
king base.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. North project area.	N/A
king ranch features	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. North project area.	N/A
king ranch points.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Point. North project area.	N/A
king ranch trails.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. North project area.	N/A
leveemerge.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. North of project area.	N/A
levtrail.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. North of project area.	N/A
randd.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. NE of project boundary.	N/A
riverlooptrail.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. NW of project boundary.	N/A
roadclip_polyline.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. North project area.	N/A
streams.hp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. NW of project boundary.	N/A
vistas.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Line. NNE project area.	N/A
femapolys.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\GIS_Data	Poly. North of project boundary.	N/A
Book 2 of 3	directory	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\Plates\	8 PDFs. Book 2 of 3 (8.5x11, 1pg) and Plate 1-1 - Plate 1-7 (each plate 36x42)	N/A
Book 3 of 3	directory	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\Plates\	15 PDFs. Book 3 of 3 (8.5x11, 1pg) and Plate 2-1 - Plate 2-7; Plate 3-1 - Plate 3-5, and Plate 4-1 - Plate 4-2 (each plate 36x42)	N/A
Alternatives Evaluation Recovered2 060415.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\Report	PDF. EI Rio Watercourse Master Plan. Alternative Evaluation Report Book 1 of 3	N/A
Mod_FEMA levee.*	HEC RAS	N/A	Yes 7	5/1/2008	Lokey	S:\WRES\FCDMCI\RVADMP\ICSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Alternatives\Structural Alternative 1	HEC RAS files. File extension F01, G01, O01, P01, PRJ, RO1	N/A

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Chnl_FldwyLevee.*	HEC RAS	N/A	Yes 7	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Alternatives\Structural Alternative 2	HEC RAS files File extension F01, G01, G02, O01, O01, P01, P02, PRJ, RO1, R02	N/A
2000fdwy_corr.*	HEC RAS	N/A	Yes 7	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Alternatives\Structural Alternative 3	HEC RAS files File extension F01, G01, G02, O01, O01, P01, P02, PRJ, RO1, R02, REP	N/A
erwmp.*	HEC RAS	No	Yes 7	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Base	HEC RAS files File extension F01, G01, G02, O01, O01, P01, P02, PRJ, RO1, R02	N/A
erwmp_rec_*.doc	DOC	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Recommended with King Ranch Levee	4 HEC RAS reports, where * = 1-4	N/A
erwmp_rec_*.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Recommended with King Ranch Levee	4 HEC RAS reports, where * = 1-4	N/A
erwmp_rec_KR.*	HEC RAS	No	Yes 7	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\EI Rio Watercourse Master Plan\Report\HEC RAS Files\Alternative Evaluation Report\Recommended with King Ranch Levee	HEC RAS files File extension F01, G01, G02, G03, G04, h01, O01, O02, O03, O04, P01, P02, P03, P04, PRJ, RO1, R02, R03, R04	N/A
landownership	SHP	No	No	5/1/2008	Feldman	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20071113	Poly Clipped to project boundary	N/A
projectboundary	SHP	No	No	5/1/2008	Feldman	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20071113	Poly The project Boundary	N/A
apex.shp	SHP	No	Yes 1	5/1/2008	Feldman	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20071113	Point Hydrologic points of concentration. No attributes. Clipped to project area	N/A
parcelsclipped.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20071114	Poly Clipped to project area	N/A
fdt.dbf	DBF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Floodway Data Table	N/A
aerials2007.dxf.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Tiles of aerials for entire county	Yes
fc_d_projects.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Line Along waterways north of proj boundary	N/A
mag_desertspaces.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Extends north and south of project area	No - missing area outside maricopa county
parcels.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Clipped to project area	No
rainbow_valley_admp.shp	SHP	No	No	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly The project Boundary	No
Bike_Routes.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Line Clipped to project Area	N/A
County_Parks.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Estrella Mtn Regional Park	N/A
ctrl-1005.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Point Northern part of project area NGVD29	N/A covers a previous FCDMC project boundary
ctrl-1030.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Point Northern part of project area NGVD29	N/A covers a previous FCDMC project boundary
ctrl-1084.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Point Northern part of project area NGVD29	N/A covers a previous FCDMC project boundary
ctrl-1180.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Point Northern part of project area NGVD29&NAVD88	N/A covers a previous FCDMC project boundary
ctrl-1260.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Point Northern part of project area NAVD88	N/A covers a previous FCDMC project boundary
ctrl-2400.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Point Northern part of project area NGVD29	N/A covers a previous FCDMC project boundary
golf.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly	N/A
Parks.shp	SHP	No	Yes 1	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Two parks within project boundary	N/A
agrct-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly outside project boundary	N/A
alris_gapveg.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Clipped to OLD project Area	No
alris_natveg.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\CSD\FromFCDMC\20080502\shp	Poly Clipped to OLD project Area	No

Table 11-1 Data Collection Log

File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
alris_own.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Clipped to OLD project Area	No
alris_riparia.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Gila River area only	N/A
alris_streams.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Clipped to OLD project Area	No
Bridge-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
Bridge-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
Bridge-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
Bridge-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
Bridge-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
Bridge-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
Bridge-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Northern part of project area	N/A covers a previous FCDMC project boundary
cartoln-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-1115.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. CAD features. Clipped to area	N/A covers a previous FCDMC project boundary
cartoln-2000.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
cartopt-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. Northern part of project area	N/A covers a previous FCDMC project boundary
cartopt-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. Northern part of project area	N/A covers a previous FCDMC project boundary
cartopt-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. Northern part of project area	N/A covers a previous FCDMC project boundary
cnl-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
cnl-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
cnl-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
cnl-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
cnl-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
cnl-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cad canals clipped to area	N/A covers a previous FCDMC project boundary
ctrlpss.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Clipped to OLD project area	No
culvert-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Clipped to project Area	N/A covers a previous FCDMC project boundary
culvert-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Clipped to project Area	N/A covers a previous FCDMC project boundary
culvert-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Clipped to project Area	N/A covers a previous FCDMC project boundary
dmbsn-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. N of project boundary	N/A covers a previous FCDMC project boundary
dmbsn-1020.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. SW of project boundary	N/A covers a previous FCDMC project boundary
dmbsn-1084.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. NE of project boundary	N/A covers a previous FCDMC project boundary
dmbsn-1221.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Intersects Project Boundary	N/A covers a previous FCDMC project boundary
dmbsn-2400.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. NW of project boundary	N/A covers a previous FCDMC project boundary
dmprthin-1221.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Within project boundary	N/A covers a previous FCDMC project boundary

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
dmp1hpt-1221.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. Within project boundary	N/A covers a previous FCDMC project boundary
elvln-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NGVD29	N/A covers a previous FCDMC project boundary
elvln-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NGVD29	N/A covers a previous FCDMC project boundary
elvln-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NGVD29	N/A covers a previous FCDMC project boundary
elvln-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NGVD29	N/A covers a previous FCDMC project boundary
elvln-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NAVD88	N/A covers a previous FCDMC project boundary
elvln-1208.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NAVD88	N/A covers a previous FCDMC project boundary
elvln-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NAVD88	N/A covers a previous FCDMC project boundary
elvln-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NAVD88	N/A covers a previous FCDMC project boundary
elvln-2000.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Contour lines. NGVD29	N/A covers a previous FCDMC project boundary
elvpt-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NGVD29	N/A covers a previous FCDMC project boundary
elvpt-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NGVD29	N/A covers a previous FCDMC project boundary
elvpt-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NGVD29	N/A covers a previous FCDMC project boundary
elvpt-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NGVD29	N/A covers a previous FCDMC project boundary
elvpt-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NAVD88	N/A covers a previous FCDMC project boundary
elvpt-1208.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NAVD88	N/A covers a previous FCDMC project boundary
elvpt-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NAVD88	N/A covers a previous FCDMC project boundary
elvpt-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NAVD88	N/A covers a previous FCDMC project boundary
elvpt-2400.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NGVD29	N/A covers a previous FCDMC project boundary
elvpt-2001.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Elevation Points. NGVD29	N/A covers a previous FCDMC project boundary
flightdate2007idx.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Countywide	Yes
fpctfcd-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. FCD control point. NGVD29	N/A covers a previous FCDMC project boundary
fpctfcd-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. FCD control point. NGVD29	N/A covers a previous FCDMC project boundary
fpctfcd-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. FCD control point. NGVD29	N/A covers a previous FCDMC project boundary
fpctfcd-1084.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. FCD control point. NGVD29	N/A covers a previous FCDMC project boundary
fpctfcd-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. FCD control point. NGVD29 & NAVD88	N/A covers a previous FCDMC project boundary
fpctfcd-2400.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point. FCD control point. NGVD29	N/A covers a previous FCDMC project boundary
fpstrfelv.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cross sections (Gila and Waterman)	N/A
fpxfema.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Cross sections (Gila and Waterman)	N/A
fpznfcd-1221.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. 100-yr Floodplain and floodway	N/A covers a previous FCDMC project boundary
fpznfcd-1269.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. 100-yr Floodplain and floodway	N/A covers a previous FCDMC project boundary
fpznfama.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Clipped to project area	No
indy.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Point.	No
lake.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly.	No
mag_future_landuse.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Clipped to project Area	No
mag_genplan.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Poly. Clipped to project area	No
MaricpaTrails.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2\shp	Line. Countywide with a bit outside Maricopa County	Yes

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
river-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Along Gila NE of proj boundary	N/A covers a previous FCDMC project boundary
river-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Along Gila full length of project boundary	N/A covers a previous FCDMC project boundary
river-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Along Gila small area NE of proj boundary	N/A covers a previous FCDMC project boundary
river-1208.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Clipped to project Area	N/A covers a previous FCDMC project boundary
river-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Waterman Wash and tribs within proj boundary	N/A covers a previous FCDMC project boundary
river-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Along Gila small area N of proj boundary	N/A covers a previous FCDMC project boundary
river-2000.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Along Salt River small area NE of proj boundary	N/A covers a previous FCDMC project boundary
rr-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Railroad north of project boundary	N/A covers a previous FCDMC project boundary
rr-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Railroad north of project boundary	N/A covers a previous FCDMC project boundary
rr-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Railroad north of project boundary	N/A covers a previous FCDMC project boundary
rr-126-.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Railroad north of project boundary	N/A covers a previous FCDMC project boundary
scs_soils.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Poly Clipped to project area	No
sections.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Poly Clipped to Maricopa County TRS sections	No
sports.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Poly Phoenix Intl. Raceway (PIR)	N/A
stnetes.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line All/most roads clipped to old project area	No
strct-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures N proj boundary	N/A covers a previous FCDMC project boundary
strct-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures NE of proj boundary	N/A covers a previous FCDMC project boundary
strct-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures in the NE proj area	N/A covers a previous FCDMC project boundary
strct-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures NE of proj boundary	N/A covers a previous FCDMC project boundary
strct-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures NW of proj boundary	N/A covers a previous FCDMC project boundary
strct-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures N proj boundary	N/A covers a previous FCDMC project boundary
strct-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures within project boundary	N/A covers a previous FCDMC project boundary
strct-2000.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures in the NE proj area	N/A covers a previous FCDMC project boundary
strtdll-1003.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Streets N proj boundary	N/A covers a previous FCDMC project boundary
strtdll-1005.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Streets NE of proj boundary	N/A covers a previous FCDMC project boundary
strtdll-1030.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures in the NE proj area	N/A covers a previous FCDMC project boundary
strtdll-1034.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Streets NE of proj boundary	N/A covers a previous FCDMC project boundary
strtdll-1180.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Streets NW of proj boundary	N/A covers a previous FCDMC project boundary
strtdll-1226.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Streets N proj boundary	N/A covers a previous FCDMC project boundary
strtdll-1260.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Streets within project boundary	N/A covers a previous FCDMC project boundary
strtdll-2000.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Structures in the NE proj area	N/A covers a previous FCDMC project boundary
supervis.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Poly Maricopa County county supervisor districts	No
swifrn.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Line Named streams in project area	No
twm_mg.shp	SHP	No	Yes 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008050 2.shp	Poly Clipped to Maricopa County Township and Range	No
fd_centerline.shp	SHP	No	Yes 1a	5/12/2008	Waskowsky	S:\WRES\FCDMC\RVADMP ICSD\FromFCDMC\2008051 2	Line Transwestern pipeline alignment through Rainbow Valley. Projection is listed as NAD83 Arizona State Planes, Central Zone, Intl Foot. Appears to be in correct location in ArcView3.x	Yes
Waterman.zip	ZIP	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP ICSD\Models\HEC-1	Zip containing HEC-1 data and printable datafor Waterman project	N/A

Table 11-1 Data Collection Log

File Name	Format	Metadata	_prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
FCDMC Piedmont Manual April 2003 Draft.pdf	PDF	N/A	N/A	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Models\Piedmont Assessment Manual April 2003 Draft	Users Manual	N/A
dtm directory	LF & PF	N/A	Unk	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ITerrain	3D point (*.prj) and line (*.lrf) files. Files listed by FCDMC project number and location. Project Numbers include 1005, 1030, 1180, and 1226.	No covers several previous FCDMC project boundary
ARCINFO directory	GEN	N/A	Unk	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ITerrain\10FOOT_DTM	3D files in text format. File names "b.gen" & "d.gen" are for lines and "p.gen" is for points. where "r" matches location to parcels\slipped.shp. In increments of 15 "r" = 510685-510865; 525685-525865; 540685-540865; 555685-555865; 570685-570865; 585685-585865; 600685-600865; 615685-615865	
MICROSTATION directory	BRE, DAT, DRN	N/A	Unk	5/2/2008	Lokey	S:\WRES\FCDMC\RVADMP\ITerrain\10FOOT_DTM	3D files. Files names "bre", "dat", and "drm". Masspoints and breaklines. In increments of 15, "r" = 510685-510865; 525685-525865; 540685-540865; 555685-555865; 570685-570865; 585685-585865; 600685-600865; 615685-615865	
GRIDASCII directory	ASC	N/A	Unk	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ITerrain\10FOOT_DTM	3D files. Apparently Masspoints. *.asc. In increments of 15, "r" = 510685-510865; 525685-525865; 540685-540865; 555685-555865; 570685-570865; 585685-585865; 600685-600865; 615685-615867	
AUTOCAD directory	DWG	N/A	Yes 1 or 2	5/1/2008	Lokey	S:\WRES\FCDMC\RVADMP\ITerrain\10FOOT_DTM	AutoCAD 3D files. Masspoints and breaklines. Called "r.dwg" where "r" in increments of 15, "r" = 510685-510865; 525685-525865; 540685-540865; 555685-555865; 570685-570865; 585685-585865; 600685-600865; 615685-615865	
Rainbow_Valley_Archaeology_Lines.shp	SHP	No	Yes 2	5/19/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080519	Line	No T3S, R3W; T4S, R2W; T5S, R2W, T5S, R1W T6S, R1W not received - not sure if no data or delivery mistake
Rainbow_Valley_Archaeology_Polygons.shp	SHP	No	Yes 2	5/19/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080519	Poly	No T3S, R3W; T4S, R2W; T5S, R2W, T5S, R1W T6S, R1W not received - not sure if no data or delivery mistake
A510_014_001WatermanWashandTributariesFloodplainDelineationStudyAppendix_A_D_3_Book2of5_Final.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	395 pages. FDS book 1 of 5 (Introduction, FEMA Forms and ADWR Abstracts, Survey and Mapping Info, Hydrology, Hydraulics, Erosion and Sediment Transport, Draft FIS Report Data, Figures, Tables)	N/A
A510_014_002WatermanWash_and_TributariesFloodplainDelineationStudyAppendix_A_D_3_Book2of5_Final.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	1764 pages. FDS book 2 of 5 (Appendix A - D3; References, General Documents and Correspondence, Survey field notes, Hydrologic Analysis Supporting Documentation)	N/A
A510_014_003WatermanWashandTributariesFloodplainDelineationStudy_Appendix_D_3_D_6_Book3of5_Final.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	3068 pages. FDS book 3 of 5 (Appendix D3-D6; Hydrologic Analysis Supporting Documentation)	N/A
A510_014_004WatermanWashandTributariesFloodplainDelineationStudy_AppendixEandF_Book4of5_Final.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	1556 pages. FDS Book 4 of 5 (Appendix E-F; Hydraulic Analysis Supporting Documentation, Erosion and Sediment Transport Analysis Supporting Documentation)	N/A
A510_014_005WatermanWash_and_FloodplainDelineationStudy_Exhibits_and_Maps_Book5of5_Final.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	33 Pages. FDS book 5 of 5 (Exhibits and Maps; 6 Exhibits (general maps); Watershed Hydrology Maps (10 sheets); HEC-1 Schematic Maps (14 Sheets))	N/A
A510_014_006WatermanWashFDSUpdateLetterofMapRevision.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	146 pages. Waterman Wash LOMR (Introduction, FEMA Forms, Survey and Mapping Information, Hydrology, Hydraulics, Erosion and Sediment Transport, Draft FIS Report Data, Figures, Tables)	N/A
1510_902Ground_WaterConditions_in_theWatermanWashArea_Maricopa_and_PinalCounties_Arizona.pdf	PDF	N/A	N/A	5/16/2008	Lokey	S:\WRES\FCDMC\RVADMP\ICSDI\Documents\20080516	30 Pages. By USGS, 1968 (Introduction, Groundwater, Chemical quality of groundwater, Volume of recoverable, Summary and conclusions, References cited, Appendix-Basic data, Figures, & Tables	N/A
GIS Data for the Rainbow Valley ADMS Project Area in ARC/INFO e00 Format	DVD	N/A	N/A	5/16/2008	Feldman	On DVD	e00 files - Same as data stored on LAN S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080502shp	
GIS Data for the Rainbow Valley ADMS Project Area in DXF Format	DVD	N/A	N/A	5/16/2008	Feldman	On DVD	DXF files - Same as data stored on LAN S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080502shp	
dtm directory	LF & PF	N/A	Unk	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ITerrain\20080522		
0607_Orthos	SID	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\Aerials\20080522	1008 1-ft MrSid images (received on 2 disks)	YES
0607_Orthos	SDW	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\Aerials\20080522	1008 SDW Files for MrSid images (received on 2 disks)	YES
ARCINFO	Directory	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ITerrain\20080522\10ft_DT	334 Arcinfo GEN files	
AUTOCAD	Directory	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ITerrain\20080522\10ft_DT	144 AutoCAD DXF	
GRIDASCII	Directory	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ITerrain\20080522\10ft_DT	112 ASC files	
MICROSTATION	Directory	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ITerrain\20080522\10ft_DT	111 BRE, 112 DAT, 112 DRN files	
aerials2007idx.shp				5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522shp	MrSid aerial index	Yes
dtm2001idx.shp				5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522shp	Index of 10-ft DTM data.	Yes
e00	Directory	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522e00	130 e00 files (match SHP listing)	Yes
DXF	Directory	N/A	N/A	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522dxf	118 DXF files (mostly matches SHP listing)	Yes
aerials2007idx.shp	SHP	No	No	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522shp	Poly. Extends outside of Maricopa County	Yes
agrdlr-1003.shp	SHP	No	Yes 1	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522shp	Poly. North of project boundary	Yes
alris_gspveg.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\20080522shp	Poly. Covers project area in Maricopa County only	No

Table 11-1 Data Collection Log

File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
alris_gfveg.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area	Yes
alris_natveg.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area	Yes
alris_own.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area	Yes
alris_riparia.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly North of project boundary	N/A
city.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Maricopa county plus Peoria in Yavapai County and Queen Creek in Pinal. Excludes unincorporated project area in Pinal county	No
ctrlplss.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly (TRS) Covers project area	Yes
drmsn-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Drainage Basins for FCDMC projects 1003, 1020, 1084, 1221, 2400	Yes
dtn2000idx.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Coverst Project Area	Yes
flightdate2007idx.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Coverst Project Area	Yes
fpzrfcd-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Floodplains for FCDMC projects 1221, 1269	Yes
fpzrfema.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
lake.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly	N/A
MAG_desertspaces.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
MAG_Development.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
MAG_Development_Subdiv.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
MAG_Development_Sublanduse.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
mag_future_landuse.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
mag_genplan.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
mag_landuse.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
parcels.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly	N/A
Rainbow_Valey_ADMP.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Correct project boundary	Yes
scs_soils.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Correct project boundary	Yes
sections.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
supervis.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
twm_mg.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Poly Covers project area in Maricopa County only	No
alris_streams.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Covers Project area	Yes
bridge-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Bridges for FCDMC projects 1003, 1020, 1030, 1180, 1226, 1260	N/A
cartoln-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Ctrloln for FCDMC projects 1003, 1005, 1030, 1034, 1115, 1180, 1226, 2000	N/A
cnl-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Canal For FCDMC projects 1003, 1005, 1030, 1180, 1226, 2000	N/A
culvert-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Culverts for FCDMC projects 1003, 1180, 1226	N/A
drmpthln_1221.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Lines Drainages for FCDMC project 1221 covers old RVADMP project area	No
elvin-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Elevation Lines for FCDMC projects 1003, 1005, 1030, 1034, 1180, 1208, 1226, 1260, 2000	Yes
fcproj.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line	
fpserfv.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Along Gila and Waterman Wash	
fpxfema.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp		
river-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Streams for FCDMC projects 1005, 1030, 1034, 1208, 1226, 1260, 2000	N/A
rr-.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSDI\FromFCDMC\2008052\2shp	Line Railroads for FCDMC projects 1003, 1030, 1180, 1260	N/A

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File Name	Format	Metadata	prj file	Date Received	Sant By	Network Location	Notes	Extent Covers Proj Area
stnrefres.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Line Covers Project Area	Yes
strcl-* .shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Line Structures for FCDMC projects 1003, 1005, 1030, 1034, 1180, 1226, 1260, 2000	N/A
strdtl-*	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Line For FCDMC projects 1003, 1005, 1030, 1034, 1180, 1226, 1260, 2000	N/A
swrfn.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Line Gila River and Waterman Wash	N/A
cartopt-* .pt	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Point For FCDMC projects 1003, 1005, 1034	N/A
ctrl-* .shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Point For FCDMC projects 1005, 1030, 1084, 1180, 1260, 2400	N/A
dmphpt-1221.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Point Covers old RVADMP area	Yes
elvpt-* .shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Point Elevation data for FCDMC projects 1003, 1005, 1030, 1034, 1180, 1208, 1226, 1260, 2000, 2400	N/A
fpctfcd-* .shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Point Covers FCDMC projects 1006, 1030, 1034, 1084, 1180, 2400	N/A
indry.shp	SHP	No	Yes 2	5/22/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080529\2ishp	Points North of project boundary	N/A
2008_Rainbow_Valley_Landscape_Character_Assessment	DVD	N/A	N/A	5/29/2008	Feldman	On DVD	Not copied to LAN Same as - S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment	
hs_100ft	hillshade	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source	Duplicate	
hs_100ft_c	hillshade	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source	Duplicate	
hscnty_50ft_c	hillshade	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source	Duplicate	
ags_physiogra.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
canals.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
dams.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
hydro.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
lake.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
cnty_50ft.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
demcon_200ft.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
street.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
trails_all_parts_public.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
arterial.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
Santan_Mountains.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	
ALRIS_indian.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp	Duplicate of S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp	

Table 11-1 Data Collection Log

File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
stateInd.shp	SHP	Yes	Yes 6	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shapes\Landuse_Map_Sources	Duplicate of S:\WRES\FCDM\CIRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shapes\Landuse_Map_Sources	
MXD directory	directory	N/A	N/A	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update	34 MXDs: at 1:250000 scale	
Legends directory	directory	N/A	N/A	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update	Legend tables/text. 7 PDFs, 11 JPGs, 8 PNGs	
nor.dxf	coverage	No	No	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\Legend	North Arrow coverage	
az_char_type	coverage	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly. Excludes project are in pinal county	
char_subtype	coverage	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
ex_metarea	coverage	Yes	No	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
ex_settings	coverage	Yes	Yes 2	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly. Excludes project are in Pinal county	
fut_metarea	coverage	Yes	No	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
char_physdiv07.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
char_subtype	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
char_type_In_lyr	layer	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Line. North of Project Area. Layer file	
chart_type_In.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Line. North of Project Area	
ex_comp1.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
ex_comp1ospr.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
ex_lcu.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
ex_ospr.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
fcd_lvc.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
fcd_vsl_minus_Erase.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
fut_comp1.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
fut_comp1ospr.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
fut_ospr.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
Future_LC_Units.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
Future_Settings.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
Future_Settings_Clip.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly. Excludes project are in Pinal county	
GilaFloodProneMC_Clip.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly. Miss Projected. Show up in Canada	not in correct location
Physical_Settings_Stream_Polygons.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDM\CIRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	

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File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
tnf.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly Tonto National Forest area	
tnf_carto.shp	layer	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly Tonto National Forest area	
tnf_in_full.lyr	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Line	not in correct location
tnf_in_full.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Line	not in correct location
tnf_poly_full.shp	SHP	Yes	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly Miss Projected. Show up in Canada	not in correct location
tnf_vsi_plus.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final	Poly	
open_spaces_with_BLM_floodplains_merged.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space	Poly	
recreation_with_BLM.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space	Poly	
Tonto_open_spaces_with_BLM.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space	Poly Outside project area	
Tonto_Recreation_with_BLM.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space	Poly Outside project area	
Combine_FPM.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Flood_Protection_Methods_Compatibility	Poly	
Future_Units_FPM_merged.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Flood_Protection_Methods_Compatibility	Poly	
Open_Spaces_FPM_merged.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Flood_Protection_Methods_Compatibility	Poly	
Recreation_FPM_merged.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Flood_Protection_Methods_Compatibility	Poly	
combine_Structure_Comp.lyr	layer	No	No	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	
combine_Structure_Comp.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	
Existing_Combine_Structure_Comp.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	
Existing_Unit_STCOMP_merged.shp	SHP	Yes	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	
Future_Unit_STCOMP_merged.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	
Open_Space_Unit_STCOMP_merged.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	

Table 11-1 Data Collection Log

File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Recreation_Unit_STCOMP_merged.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\final\open space\Combined\Structure_Type_Compatibility	Poly	
Excel	directory	N/A	N/A	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update	2 Excel spreadsheets - Cultural Setting Reclassification.xls and Database Overview.xls	
County_Wide_PDFs	directory	N/A	N/A	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\County_Wide_PDFs	16 Countywide PDF maps at 1:250000 scale, print size 55x36	
chart_type	coverage	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line Needs to be built	
cnty	coverage	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly Maricopa County boundary	
counties	coverage	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly	
panels	coverage	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly	
studyarea	coverage	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly	
hillshade2	hillshade	No	Yes 3	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Hillshade	
hs_100ft	hillshade	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Hillshade	
hs_100ft_c	hillshade	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Hillshade Maricopa County only	
hscnty_50ft_c	hillshade	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Hillshade Maricopa County only	
250road_labels.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
arterial.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
arterial1.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
canal_labels	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
counties_polygon.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly	
demcon_200ft.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
Lakes.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly	
maricopa.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly Maricopa County boundary	
maricopa_santan_mountains.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly Maricopa county only	
Maricopa_Streams_Polygons.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly Maricopa county only	
MaricopaTrails.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
MaricopaTrails_Buffer.shp	SHP	No	Yes 2	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly Maricopa county only	
New_202.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line Outside project area	
panels.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Poly 1:250000 panels	
recreation_trails.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line Maricopa County only	

Table 11-1 Data Collection Log								
File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
stream_labels.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
streams.lyr	layer	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
streams.shp	SHP	No	Yes 1	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
travelways.shp	SHP	No	No	5/29/2008	Feldman	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	Line	
apex.shp	SHP	No	Yes 1	6/4/2008	Gross	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080604	Point	
GIS Checking Programs	directory	N/A	N/A	6/3/2008	Dennis (FCD)	S:\WRES\FCDMC\RVADMP\ICSD\Documents\	From FCDMC. Do NOT call with questions	
Data	directory	N/A	N/A	6/4/2008	Dennis (FCD)	\\hfile2\staticdata\WRES\FCDMC\RVADMP\ICSD\Documents\Survey Standards	District Survey Docs. Standards 2008 (1 DOC, 1 TXT)	
Sketches	directory	N/A	N/A	6/4/2008	Dennis (FCD)	\\hfile2\staticdata\WRES\FCDMC\RVADMP\ICSD\Documents\Survey Standards	District Survey Docs. Standards 2008 (11 JPGs)	
Photos	directory	N/A	N/A	6/5/2008	Dennis (FCD)	\\hfile2\staticdata\WRES\FCDMC\RVADMP\ICSD\Documents\Survey Standards	District Survey Docs. Standards 2008 (25 JPGs)	
RVADMP Schedule ExistCond.pdf	PDF	N/A	N/A	5/11/2008	B. Fry (Fuller)	S:\WRES\FCDMC\RVADMP	PDF of exiting conditions schedule	
NOAA14AsciiGridFiles.zip	Zip	N/A	N/A	7/3/2008	Glenn Card 3 (FCD)	S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080703	GridASCII files for NOAA 14 (one grid file for 100-year 24-hr and one grid file for 100-year 6-hr) for Rainbow Valley ADMS watershed	
GilaBendMtns-SonoranDesertNM-SierraEstrella_LinkageDesign (2).pdf	PDF	N/A	N/A	7/17/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080717	109 page document. Beier, P., E. Garding, and D. Majka. 2008. Arizona Missing Linkages: Gila Bend - Sierra Estrella Linkage Design. Report to Arizona Game and Fish Department. School of Forestry, Northern Arizona University.	
Sunset Point Acceration Project UPRR.pdf	PDF	N/A	N/A	8/4/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080804	321 pages. Figures and photos of existing and proposed culverts	
FCDMC 2007 West Valley Deliverable 5	directory	N/A	N/A	7/8/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080708	Deliverable 5 IGA FCD 2005A005 IGA ADWR No 2005-25781.pdf, 6 rasters of the SAR, GWSI data	
MCFCDD_West_Valley_2006	directory	N/A	N/A	7/8/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080708	Deliverable 3 IGA ADWR No 2005-25781 GA.pdf, 10 rasters, AZ_Hardrock.shp, documtns supporting the rasters	
RVADMP Stakeholder involvement strategy debbi.rtf	RTF	N/A	N/A	8/18/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080818	Rainbow valley area drainage master plan stakeholder involvement plan	
022008 DCR.pdf	PDF	N/A	N/A	8/18/2008	B. Frye	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080818	BUCKEYE AREA DRAINAGE MASTER PLAN FCD 2004CO58 DATA COLLECTION REPORT	
streams.shp	SHP	No	Yes 8	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Received 3 times previously - S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base S:\WRES\FCDMC\RVADMP\ICSD\FromFCDMC\20080502\shp	
streams.lyr	layer	N/A	Yes 8	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Received 3 times previous (see above)	
canal.shp	SHP	No	No	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Not projected- aligns with ags_physiogra.shp	
arterial.shp	SHP	No	Yes 1	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Duplicate of 4 previously received datasets - S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\source\shp S:\WRES\FCDMC\RVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\base S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\source\shp S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080529\2008_LIA_Update\2008_LIA_Update\base	
trails_all_parts_public.shp	SHP	No	Yes 1	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Received 2 times previously	
MaricopaTrails.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Received 2 times previously	
ALRIS_indian.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Received 2 times previously	
ags_physiogra.shp	SHP	No	No	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Not projected- aligns with canal.shp	
maricopa.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	County boundary received more than 5 times	
panels	coverage	No	Yes 1	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\ICSD\Documents\20080821\2008_LIA_Update\Base	Received 5 times previously - not needed for RVADMP	

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
nor_dxf	coverage	No	No	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Base	Received 2 times previously	
hscnty_50ft_c	grid	No	Yes 1	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Base	Received 4 times	
hs_100ft_c	grid	No	Yes 1	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Base	Received 4 times	
hs_100ft	grid	No	Yes 1	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Base	Received 4 times	
clip.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Received once previously	
Existing_LCUs_ADMF.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Existing_LCUs_Clip.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Futura_Combined_FPM_clip	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Futura_Combined_Structure_Clip	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Futura_FPM_Compatibility_Clip	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Future_Land_Use_2008_clip	SHP	No	No	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Future_LCUs_Clip	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Future_ST_SubClass_Compatibility_Clip	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Open_Space_Resources_Floodplains_Clip.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
Physical_Settings_clip	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	Not previously received with this name	
rainbow_valley_admp.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip	received twice previously	
Recreation_Resources_Clip.shp	SHP	No	No	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip		
recreation_with_BLM.shp	SHP	No	No	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Clip		
Santan_Mtn.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files	Received 4 times previously under different names	
Regional_Parks.shp	SHP	No	Yes 1	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files		
Future_Metro_Cultural_S.shp	SHP	No	No	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files	Fills in gap in Future_Cultural_Settings.shp (below)	
Future_Cultural_Settings.shp	SHP	No	No	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files	contains future lu data	
Existing_Cultural_Settings.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files		
Exis_Metro_Cultural_Settings.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files	Fills in gap in Existing_Cultural_Settings.shp (above)	
Combined_Parks_Opens_Space_ST_COMP.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files		
Combined_Parks_Opens_Space_FPM_COMP.shp	SHP	No	Yes 2	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\Extra_Shape_Files		
Future_LCUs.lyr	layer	N/A	N/A	8/21/2008	B Lokey	S:\WRES\FCDM\CIRVADMP\CSD\Documents\20080821\2008_LIA_Update\layers	symbology file for future land use landscape characture units	

Table 11-1 Data Collection Log								
File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Existing_LCUs.lyr	layer	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\layers	symbology file for existing land use landscape character units	
ST_Combined2.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update	matrix?	
COMP.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
FPM_Combined.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
FUTURE_COMP.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
Future_FPM_Combined_Matrix.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
FUTURE_Structure2.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
Future_Structure_Combined_Matrix.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
FUTURE_Stuc_Comp.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
Struc_Comp.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
Structure2.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
Sum_Output.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
Sum_Output2.dbf	DBF	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Excell_M	atrix	
MXD directory	directory	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\MXDs	15 Maps with updated data (I think)	
PDF directory	directory	N/A	N/A	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\PDFs	14 PDFs	
Combined_FPM.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Combined_FPM_Dissolve.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Combined_ST_COMP.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Combined_ST_COMP_Dissolve1.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Existing_Cultural_Settings_Metro.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Existing_landuse_2004.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Existing_LCUs.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Existing_ST_SubClass_Compatibility.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Existing_FPM_Compatibility.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_Combined_FPM.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_Combined_Structure_Comp.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_Combined_Structure_Comp_Dissolve.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_Cultural_Settings_Metro.shp	SHP	No	No	8/21/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	

Table 11-1 Data Collection Log

File Name	Format	Metadata	.prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
Future_FPM_Compatibility.shop	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_Land_Use_2008.sph	SHP	No	No	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_LCUs.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Future_ST_SubClass_Compatibility.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Open_Space_FPM_merged.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Open_Space_STCOMP_merged.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Physical_Settings_Stream_Polygons.shp	SHP	No	Yes 2	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Recreation_FPM_merged.shp	SHP	No	No	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
Recreation_STCOMP_merged.shp	SHP	No	No	8/21/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\20080821\2008_LIA_Update\Final	Not previously received with this name	
clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Existing_LCUs_ADMP.SHP	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Existing_LCUs_clip.SHP	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_Combined_FPM_clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_Combined_FPM_Clip	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_Combined_Structure.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_FPM_Combatibility_clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_Land_Use_2008_Clip.shp	SHP	No	No	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_LCUs_ADMP.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_LCUs_clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Future_ST_SubClass_Compatibility_Clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Open_Space_Resources_floodplains_clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Physical_Settings_Clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
rainbow_valley_admp.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Recreation_Resources_Clip.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMCRVADMP\ICSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		

Table 11-1 Data Collection Log

File Name	Format	Metadata	prj file	Date Received	Sent By	Network Location	Notes	Extent Covers Proj Area
recreation_with_BLM.shp	SHP	No	Yes -2	8/27/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\clip		
Directory	MXD	N/A	N/A	8/27/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\mxds	15 MXDs	
Directory	PDFs	N/A	N/A	8/27/2008	B. Lokey	S:\WRES\FCDMC\RVADMP\CSD\Documents\2008_Rainbow_Valley_Landscape_Character_Assessment\PDFs	14 PDFs	
Directory	PDFS	N/A	N/A	10/8/2008	Newland Communities	S:\WRES\FCDMC\RVADMP\CSD\FromDevelopers\Newland_Communities_20081008\LOMR	LOMRs of Estralla Mtn Ranch (1 document, 5 maps)	
General Plan Amendment Book.pdf	PDF	N/A	N/A	10/15/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081015	Estrella Region II Major General Plan Amendment Dated 5-1-07, 8-6-07, 9-14-08	
Directory	Misc	N/A	N/A	10/15/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081015\Waterman Wash Concept Plan - City of Goodyear\Report and PDFs	Waterman Wash Concept Plan - City of Goodyear Report and PDFs - 1 word doc, 21 PDFs	
fpbln.shp	SHP	No	No	10/15/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081015\Waterman Wash Concept Plan - City of Goodyear\Drainage Information	Rainbow Valley baselines	
fpxfcd.shp	SHP	No	No	10/15/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081015\Waterman Wash Concept Plan - City of Goodyear\Drainage Information	Rainbow Vally cross-sections	
fpzncd.shp	SHP	No	No	10/15/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081015\Waterman Wash Concept Plan - City of Goodyear\Drainage Information	Rainbow Valley floodplains	
Engineer Files	misc	N/A	N/A	10/15/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081015\Waterman Wash Concept Plan - City of Goodyear\Drainage Information	Waterman.f01, Waterman.g01, Waterman.O01, Waterman.p01, waterman.ro1, waterman.prj, H2debug.out, WWREV.FDW	
Railroad	Directory	N/A	N/A	10/28/2008	A Aman UPRR/ D Razavian OAC Consulting	S:\WRES\FCDMC\RVADMP\CSD\Documents\20081028\Railroad	UPRR docuemtns - photos the bridge survey, engineer files of structures, document on replacment structure recommendations (from august 2006)	
Soils Data Tables	Access	Yes	N/A	12/18/2008	Downloaded from NRCS	S:\WRES\FCDMC\RVADMP\CSD\FromNRCS\20081218	Three sets of Databases of NRCS tabular to join to Soils data from FCDMC, if needed. (BC)	
Rainbow Valley linkages_fr.pdf	PDF	N/A	N/A	1/14/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\FromAzGF	PDF of the updated wildlife corridor planned by Arizona Game and Fish for the Rainbow Valley Study Area. This revised planned corridor reflects comments that applied to routing the corridor in such as manner that it took the underlying land use into account.	
GilaEstrella_MaximizeBLM.shp	SHP	No	Yes 10	1/14/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\FromAzGF	updated GIS information that I received from the District for the Rainbow Valley Study Area. This reflects their change to show the preferred comridor in a location that utilizes the BLM lands rather than the previous version that had conflicts with the underlying land uses	
GilaEstrella_SouthernBighorn.shp	SHP	No	Yes 10	1/14/2008	J Griffin	S:\WRES\FCDMC\RVADMP\CSD\FromAzGF	updated GIS information that I received from the District for the Rainbow Valley Study Area. This reflects their change to show the preferred comridor in a location that utilizes the BLM lands rather than the previous version that had conflicts with the underlying land uses	

.prj Values PRJ Name

- 1 NAD_1983_StatePlain_Arizona_Central_FIPS_0202_IntlFeet
 - 1a NAD83 Arizona State Planes, Central Zone, Intl Foot
 - 2 NAD_1983_HARN_StatePlain_Arizona_Central_FIPS_0202_IntlFeet
 - 3 WGS_1984_UTM_Zone_12N
 - 4 Clarke_1866_UTM_Zone_12N
 - 5 GCS_Clarke_1866
 - 6 NAD_1983_HARN_UTM_Zone_12N
 - 7 PRJ File in HEC RAS does not define projection
 - 8 NAD_1983_StatePlain_Arizona_Central_FIPS_0202_Feet
 - 9 GCS_North_American_1983
 - 10 NAD_1983_UTM_Zone_12N
- SDW SDW attached

Notes

- Clipped to project Boundary clipped to project boundary. No data outside project boundary
- Clipped to projec area clipped to a rectangular area that encompasses project boundary

RAINBOW VALLEY
Reference Drainage Reports
2008

Number:	Project Title:	QS#	HTE#
1	Cotton Lane Half Street Interim	104	
2	King Ranch	104	
3	King Ranch Phase I Infrastructure	104	
4	King Ranch Phase 1 Unit 1	104	
5	King Ranch Unit 3 Parcel 5	104	
6	EMR Monument Entry Drainage Study	116	06-3685
7	EMR Parcel 52	124	99-1251
8	EMR Parcel 54	124	
9	EMR Parcel 68	124	
10	EMR Parcel 70	124	00-0397
11	EMR Parcel 71	124	02-0490
12	EMR Parcel 72	124	
13	EMR Parcel 74	124	01-0302
14	EMR San Gabriel Drive Phase 1 & Corgett Wash	124	99-3196
15	EMR Parcels 7.2, 7.3, 7.6, 7.7, 7.8, 7.9, 7.10, 9.2, 9.3 (Prelim.)	125	
16	EMR Parcel 73	125	
17	EMR Parcel 75	125	
18	EMR Parcel 76	125	
19	EMR Recreation Center	125	
20	Mountain Ranch Market Place @ Estrella (Pkwy/Elliot)Prelim.	125	08-0842
21	Parcel 57 at Estrella (Amended)	125	
22	EMR parcels 5.1, 5.3, 5.5 (Prelim.)	134	
23	Palisades @ EMR	134	05-2587
24	EMR Parcel 5.9	134	
25	EMR Sidewinder Dr & W. Evening Star Drive	144	
26	EMR Coronado Village Parcel 7.2	144	
27	EMR Coronado Village Parcel 7.3	144	
28	EMR Coronado Village Parcel 7.7	144	
29	EMR Coronado Village Parcel 7.8	144	
30	EMR Coronado Village Parcel 7.9	144	05-6692
31	EMR Coronado Village Parcel 7.10	144	05-4386
32	EMR Coronado Village Parcel 9.2	144	05-4387
33	EMR Coronado Village Parcel 9.3	144	05-7104
34	EMR Parcel 95	144	
35	EMR Parcel 96	144	03-0841
36	EMR Parcel 97	144	05-6196
37	EMR Parcel 98	144	05-6197
38	EMR Parcel 99	144	
39	EMR Parcel 100A	144	
40	EMR Parcel 100B	144	
41	EMR Golf Village Parcel 195	144	99-1900
42	EMR Golf Village Parcel 196-A	144	00-2835
43	EMR Golf Village Parcel 196-B	144	99-2423
44	EMR Golf Village Parcel 201	144	99-3388
45	EMR Golf Village Community	144	99-0235
46	EMR San Gabriel Drive Phase II	144	00-3847
47	EMR Westar Drive, Phases 2 and 3	144	
48	Montecito Phase 3	144	
49	Estrella Parkway Extension	145	
50	EMR Estrella Parkway - Phase 3-S & SE Portion (Vol. 1 of 2)	145	
51	EMR Estrella Parkway - Phase 3-S & SE Portion (Vol. 2 of 2)	145	
52	EMR Golf Village Westar DR & Golf Club Drive	145	99-2583
53	EMR Community Park Phase 1	145	07-0723
54	EMR Parcel 7.4 Park Site	145	06-4958
55	Buckeye H.S.	145	
56	EMR Province - Phase 1, parcel 2- Model Complex	146	
57	Portion of Montecito, Phase 3 @ Estrella (Prelim.)	153	
58	EMR Phase 2 Collector RDS - Calistoga Dr.	154	06-3022
59	EMR Phase 2 Parcel 7.14	154	06-3025
60	EMR Phase 2 Parcel 9.4	154	06-3019
61	EMR Parcel 9.8	154	
62	EMR Phase 2 Parcel 9.26	154	06-3024
63	EMR Coronado Village - Infrastructure	154	
64	EMR Coronado Village - PH.2 Parcels 7.14,9.26,9.4,9.5,9.6 (Prelim.)	154	
65	EMR Montecito Village S. 182nd Dr. & E. Calistoga Dr.	154	06-4709
66	Terrasante	163	
67	EMR Province - Phase 1A Community Center	164	
68	EMR Province - Phase 1A POD I	164	
69	EMR Province - Phase 1B POD II	164	
70	EMR Province	164	
71	EMR Province - Loop Road	164	
72	EMR Coronado Village Phase 2 - Willis Road	164	06-4398
73	Rainbow Valley	184	
74	Madiera (master Planned Community) Conceptual Master Dr	235	



APPENDIX A

WILDLIFE IN THE RAINBOW VALLEY STUDY AREA

Appendix A
Wildlife in the Rainbow Valley Study Area

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriparian	Mesquite Bosque	Agriculture	Developed	Industrial
Lowland burrowing treefrog <i>Smilisca fodiens</i>		◆								
Western narrow-mouthed toad <i>Gastrophryne olivacea</i>		◆								
Rio Grande leopard frog <i>Rana berlandieri</i>					◆			◆		
American bullfrog <i>Rana catesbeianus</i>					◆			◆		
Sonoran Desert toad <i>Bufo alvarius</i>	◆		◆					◆		
Great Plains Toad <i>Bufo cognatus</i>	◆							◆		
Red-spotted toad <i>Bufo punctatus</i>	◆	◆	◆	◆	◆	◆	◆	◆		
Woodhouse's Toad <i>Bufo woodhousii</i>					◆			◆		
Couch's spadefoot toad <i>Scaphiopus couchii</i>	◆									
Pond slider <i>Trachemys scripta</i>			◆							
Arizona Mud Turtle <i>Kinosternon arizonense</i>		◆								
Sonora Mud turtle <i>Kinosternon sonoriense</i>					◆					
Desert tortoise <i>Gopherus agassizii</i>			◆	◆						
Spiny softshell <i>Apalone spinifera</i>					◆					
Mediterranean geko <i>Hemidactylus turcicus</i>									◆	
Western banded gecko <i>Coleonyx variegatus</i>	◆		◆	◆	◆	◆	◆			
Gila monster <i>Heloderma suspectum</i>			◆	◆						
Sonoran collared lizard <i>Crotaphytus nebrius</i>			◆	◆						
Long-nosed leopard lizard <i>Gambelia wislizenii</i>	◆		◆							
Desert iguana <i>Dipsosaurus dorsalis</i>	◆									

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriparian	Mesquite Bosque	Agriculture	Developed	Industrial
Common chuckwalla <i>Sauromales ater</i>			◆	◆						
Zebra-tailed lizard <i>Callisaurus draconoides</i>	◆		◆							
Goode's horned lizard <i>Phrynosoma goodei</i>	◆									
Regal horned lizard <i>Phrynosoma solare</i>	◆		◆							
Desert spiny lizard <i>Sceloporus magister</i>	◆		◆							
Long-tailed brush lizard <i>Urosaurus graciosus</i>	◆		◆							
Ornate tree lizard <i>Urosaurus ornatus</i>	◆		◆	◆	◆	◆	◆			
Common side-blotched lizard <i>Uta stansburiana</i>	◆		◆	◆	◆	◆	◆			
Tiger whiptail <i>Aspidoscelis tigris</i>	◆		◆	◆	◆	◆	◆			
Red-backed whiptail <i>Aspidoscelis xanthonota</i>			◆	◆						
Desert night lizard <i>Xantusia vigilis</i>				◆						
Mexican rosy boa <i>Charina trivirgata trivirgata</i>			◆	◆						
Glossy snake <i>Arizona elegans</i>	◆									
Variable sandsnake <i>Chilomeniscus stramineus</i>			◆			◆				
Western shovel-nosed snake <i>Chionactis occipitalis</i>	◆									
Desert night snake <i>Hypsiglena chlorophaea</i>	◆		◆	◆	◆	◆	◆			
Common kingsnake <i>Lampropeltis getula</i>					◆			◆		
Sonoran whipsnake <i>Masticophis bilineatus</i>			◆	◆						
Coachwhip <i>Masticophis flagellum</i>	◆		◆	◆	◆	◆	◆			
Saddle leaf-nosed snake <i>Phyllorhynchus browni</i>			◆	◆						
Spotted leaf-nosed snake <i>Phyllorhynchus decurtatus</i>	◆		◆							
Gopher or bull snake <i>Pituophis catenifer</i>	◆		◆		◆	◆	◆			

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Long-nosed snake <i>Rhinocheilus lecontei</i>	◆		◆							
Western patch-nosed snake <i>Salvadora hexalepis</i>	◆		◆	◆	◆	◆	◆			
Groundsnake <i>Sonora semiannulata</i>	◆		◆	◆	◆	◆	◆			
Checkered gartersnake <i>Thamnophis marcianus</i>	◆		◆		◆		◆			
Western lyresnake <i>Trimorphodon lambda</i>			◆							
Sonoran coral snake <i>Micruroides euryxanthus</i>			◆			◆				
Western threadsnake <i>Leptotyphlops humilis</i>	◆		◆							
Western diamond-backed rattlesnake <i>Crotalus atrox</i>	◆		◆	◆						
Sidewinder <i>Crotalus cerastes</i>	◆									
Speckled rattlesnake <i>Crotalus mitchellii</i>			◆	◆						
Black-tailed rattlesnake <i>Crotalus molossus</i>			◆	◆						
Mojave rattlesnake <i>Crotalus scutulatus</i>	◆									
tiger rattlesnake <i>Crotalus tigris</i>			◆	◆						
Desert shrew <i>Notiosorex crawfordi</i>	◆		◆	◆	◆	◆				
California leaf-nosed bat <i>Macrotus californicus</i>	◆		◆	◆						
Lesser long-nosed bat <i>Leptonycteris yerbabuenae</i>			◆	◆						
Yuma myotis <i>Myotis yumanensis</i>				◆	◆					
Cave myotis <i>Myotis velifer</i>			◆	◆	◆					
California myotis <i>Myotis californicus</i>			◆	◆	◆					
Western pipistrelle <i>Parastrellus hesperus</i>			◆	◆	◆					
Big brown bat <i>Eptesicus fuscus</i>				◆	◆					

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Western red bat <i>Lasiurus blossevillii</i>					◆					
Western yellow bat <i>Lasiurus xanthinus</i>					◆				◆	
Townsend's big-eared bat <i>Corynorhinus townsendii</i>				◆	◆					
Pallid bat <i>Antrozous pallidus</i>	◆		◆	◆	◆					
Brazilian free-tailed bat <i>Tadarida brasiliensis</i>	◆			◆	◆					
Big free-tailed bat <i>Nyctinomops macrotis</i>				◆	◆					
Pocketed free-tailed bat <i>Nyctinomops femorosaccus</i>				◆	◆					
Western mastiff bat <i>Eumops perotis californicus</i>				◆	◆					
Desert cottontail <i>Sylvilagus audubonii</i>	◆		◆	◆	◆	◆	◆			
Antelope jackrabbit (possible) <i>Lepus alleni</i>		◆								
Black-tailed jackrabbit <i>Lepus californicus</i>	◆		◆							
Harris's antelope ground squirrel <i>Ammospermophilus harrisi</i>	◆		◆							
Rock squirrel <i>Spermophilus variegatus</i>			◆	◆						
Round-tailed ground squirrel <i>Spermophilus tereticaudus</i>	◆									
Botta's pocket gopher <i>Thomomys bottae</i>	◆		◆							
Little pocket mouse <i>Perognathus longimembris</i>	◆									
Arizona pocket mouse <i>Perognathus amplus</i>	◆									
Silky pocket mouse <i>Perognathus flavus</i>		◆								
Bailey's pocket mouse <i>Chaetodipus baileyi</i>			◆	◆						
Rock pocket mouse <i>Chaetodipus intermedius</i>				◆						
Sonoran Desert pocket mouse <i>Chaetodipus penicillatus</i>	◆									
Merriam's kangaroo rat <i>Dipodomys merriami</i>	◆		◆							

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Veol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Desert kangaroo rat <i>Dipodomys deserti</i>	◆									
Western harvest mouse <i>Reithrodontomys megalotis</i>		◆			◆	◆	◆			
Cactus mouse <i>Peromyscus eremicus</i>	◆		◆	◆	◆	◆				
Mesquite mouse <i>Peromyscus merriami</i>		◆					◆			
Deer mouse <i>Peromyscus maniculatus</i>	◆		◆	◆	◆	◆				
Southern grasshopper mouse <i>Onychomys torridus</i>	◆									
Arizona cotton rat <i>Sigmodon arizonae</i>					◆		◆			
White-throated woodrat <i>Neotoma albigula</i>			◆	◆						
Arizona woodrat <i>Neotoma devia</i>	◆		◆							
Porcupine <i>Erethizon dorsatum</i>					◆	◆				
Coyote <i>Canis latrans</i>	◆		◆	◆	◆	◆	◆	◆		
Kit fox <i>Vulpes macrotis</i>	◆									
Gray fox <i>Urocyon cinereoargenteus</i>			◆	◆						
Raccoon <i>Procyon lotor</i>					◆				◆	
Ringtail <i>Bassariscus astutus</i>				◆						
Badger <i>Taxidea taxus</i>	◆		◆							
Western spotted skunk <i>Spilogale gracilis</i>				◆						
Striped skunk <i>Mephitis mephitis</i>					◆			◆		
Jaguar <i>Panthera onca (extirpated)</i>				◆						
Mountain lion <i>Puma concolor</i>			◆	◆						
Bobcat <i>Lynx rufus</i>			◆	◆						
Collared peccary <i>Pecari tajacu</i>	◆		◆	◆	◆	◆				

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Lower Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriparian	Mesquite Bosque	Agriculture	Developed	Industrial
Mule deer <i>Odocoileus hemionus</i>	◆		◆	◆	◆	◆	◆	◆		
Bighorn sheep <i>Ovis canadensis</i>				◆						
Least bittern <i>Ixobrychus exilis</i>					◆					
American bittern <i>Botaurus lentiginosus</i>					◆					
Black-crowned night heron <i>Nycticorax nycticorax</i>					◆					
Green heron <i>Butorides striatus</i>					◆					
Cattle egret <i>Bubulcus ibis</i>					◆			◆		
Snowy egret <i>Egretta thula</i>					◆					
Great egret <i>Ardea alba</i>					◆					
Great blue heron <i>Ardea herodias</i>					◆					
Canada goose <i>Branta canadensis</i>					◆					
Mallard <i>Anas platyrhynchos</i>					◆					
Gadwall <i>Anas strepera</i>					◆					
Green-winged teal <i>Anas crecca</i>					◆					
American wigeon <i>Anas americana</i>										
Northern pintail <i>Anas acuta</i>					◆					
Northern shoveler <i>Anas clypeata</i>					◆					
Cinnamon teal <i>Anas cyanoptera</i>					◆					
Ruddy duck <i>Oxura jamaicensis</i>					◆					
Fulvous whistling duck <i>Dendrocygna bicolor</i>					◆					
Black-bellied whistling duck <i>Dendrocygna autumnalis</i>					◆					
Canvasback <i>Aythya valisineria</i>					◆					

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Yekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Redhead <i>Aythya americana</i>					◆					
Ring-necked duck <i>Aythya collaris</i>					◆					
Lesser scaup <i>Aythya affinis</i>					◆					
Common goldeneye <i>Bucephala clangula</i>					◆					
Bufflehead <i>Bucephala albeola</i>					◆					
Pied-billed grebe <i>Podilymbus podiceps</i>					◆					
Common merganser <i>Mergus merganser</i>					◆					
Yuma clapper rail <i>Rallus longirostris yumanensis</i>					◆					
Virginia rail <i>Rallus limicola</i>					◆					
Sora <i>Porzana carolina</i>					◆					
Common moorhen <i>Gallinula chloropus</i>					◆					
American coot <i>Fulica americana</i>					◆					
American avocet <i>Recurvirostra americana</i>					◆					
Black-necked stilt <i>Himantopus mexicanus</i>					◆					
Snowy plover <i>Charadrius alexandrinus</i>					◆					
Killdeer <i>Charadrius vociferus</i>					◆			◆	◆	
Spotted sandpiper <i>Actitis macularia</i>					◆					
Long-billed dowitcher <i>Limnodromus scolopaceus</i>					◆					
Wilson's snipe <i>Gallinago delicata</i>					◆					
Least sandpiper <i>Calidris minutilla</i>					◆					
Ring-billed gull <i>Larus delawarensis</i>					◆					
Glaucus gull <i>Larus hyperboreus</i>					◆					

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Turkey vulture <i>Cathartes aura</i>	◆		◆	◆	◆	◆	◆	◆		
Golden eagle <i>Aquila chrysaetos</i>	◆		◆	◆						
Northern harrier <i>Circus cyaneus</i>					◆			◆		
Sharp-shinned hawk <i>Accipiter striatus</i>					◆			◆	◆	
Cooper's hawk <i>Accipiter cooperii</i>					◆			◆	◆	
Red-tailed hawk <i>Buteo jamaicensis</i>	◆		◆	◆	◆		◆	◆		
Rough-legged hawk (winter) <i>Buteo lagopus</i>					◆			◆		
Ferruginous hawk (winter) <i>Buteo regalis</i>					◆			◆		
Harris's hawk <i>Parabuteo unicinctus</i>			◆	◆						
American kestrel <i>Falco sparverius</i>	◆		◆	◆	◆	◆	◆	◆		
Merlin (winter) <i>Falco columbarius</i>					◆					
Prairie falcon <i>Falco mexicanus</i>	◆			◆						
Peregrine falcon <i>Falco peregrinus</i>				◆	◆					
Gambel's quail <i>Callipepla gambelii</i>			◆			◆				
Rock pigeon <i>Columba livia</i>									◆	◆
Mourning dove <i>Zenadia macroura</i>	◆		◆	◆	◆	◆	◆	◆	◆	
White-winged dove <i>Zenadia asiatica</i>	◆		◆	◆	◆	◆	◆	◆		
Common ground-dove <i>Columbina passerina</i>					◆			◆	◆	
Inca dove <i>Columbina inca</i>									◆	
Yellow-billed cuckoo <i>Coccyzus americanus</i>					◆		◆			
Greater roadrunner <i>Geococcyx californianus</i>	◆		◆	◆	◆	◆	◆			
Barn owl <i>Tyto alba</i>	◆		◆	◆	◆	◆	◆	◆		

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Western screech owl <i>Megascops kennicottii</i>			◆	◆		◆				
Ferruginous pygmy-owl <i>Glaucidium brasilianum</i>			◆	◆		◆				
Great horned owl <i>Bubo virginianus</i>	◆		◆	◆		◆				
Elf owl <i>Micrathene whitneyi</i>			◆	◆		◆				
Burrowing owl <i>Athene cunicularia</i>	◆									
Long-eared owl <i>Asio otus</i>					◆			◆		
Common poorwill <i>Phalaenoptilus nuttallii</i>			◆	◆						
Lesser nighthawk <i>Chordeiles acutipennis</i>	◆		◆	◆	◆	◆	◆			
White-throated swift <i>Aeronautes saxatalis</i>	◆		◆	◆	◆					
Black-chinned hummingbird <i>Archilochus alexandri</i>					◆	◆				
Anna's hummingbird <i>Calypte anna</i>					◆				◆	
Costa's hummingbird <i>Calypte costae</i>			◆	◆		◆				
Belted kingfisher <i>Ceryle alcyon</i>					◆					
Gila woodpecker <i>Melanerpes uropygialis</i>	◆		◆	◆		◆	◆		◆	
Gilded flicker <i>Colaptes auratus</i>			◆	◆		◆				
Ladder-backed woodpecker <i>Picoides scalaris</i>			◆	◆		◆				
Western kingbird <i>Tyrannus verticalis</i>	◆		◆	◆		◆		◆	◆	
Brown-crested flycatcher <i>Myiarchus tyrannulus</i>					◆		◆	◆		
Ash-throated flycatcher <i>Myiarchus cinerascens</i>	◆		◆	◆	◆	◆	◆	◆	◆	
Black phoebe <i>Sayornis nigricans</i>					◆					
Say's phoebe <i>Sayornis saya</i>	◆		◆	◆		◆	◆	◆		
Vermilion flycatcher <i>Pyrocephalus rubinus</i>					◆	◆				

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Willow flycatcher <i>Empidonax trillii</i>					◆					
Loggerhead shrike <i>Lanius ludovicianus</i>	◆		◆	◆	◆	◆	◆	◆		
Bell's vireo <i>Vireo bellii</i>					◆	◆				
Common raven <i>Corvus corax</i>	◆		◆	◆	◆	◆	◆	◆	◆	
Horned lark <i>Eremophila alpestris</i>	◆									
Violet-green swallow <i>Tachycineta thalassina</i>					◆			◆		
Northern rough-winged swallow <i>Stelgidopterys serripennis</i>					◆	◆				
Cliff swallow <i>Hirundo pyrrhonota</i>					◆			◆		
Verdin <i>Auriparus flaviceps</i>	◆		◆	◆	◆	◆	◆			
Bewick's wren <i>Thryomanes bewickii</i>					◆	◆				
Canyon wren <i>Catherpes mexicanus</i>				◆						
Rock wren <i>Salpinctes obsoletus</i>			◆	◆		◆				
Cactus wren <i>Campylorhynchus brunneicapillus</i>			◆	◆		◆				
House wren <i>Troglodytes aedon</i>					◆					
Black-tailed gnatcatcher <i>Polioptila melanura</i>			◆	◆		◆				
Blue-gray gnatcatcher <i>Polioptila caerulea</i>					◆	◆				
Ruby-crowned kinglet <i>Regulus calendula</i>					◆	◆				
Western bluebird <i>Sialia mexicana</i>					◆	◆				
Mountain bluebird <i>Sialia currucoides</i>					◆			◆		
American robin <i>Turdus migratorius</i>					◆				◆	
Northern mockingbird <i>Mimus polyglottos</i>	◆		◆	◆	◆	◆	◆	◆	◆	

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Sage thrasher <i>Oreoscoptes montanus</i>			◆							
Curve-billed thrasher <i>Toxostoma curvirostre</i>			◆	◆		◆				
Bendire's thrasher <i>Toxostoma bendirei</i>	◆		◆							
Crissal thrasher <i>Toxostoma crissale</i>			◆			◆				
Leconte's thrasher <i>Toxostoma lecontei</i>	◆									
Phainopepla <i>Phainopepla nitens</i>			◆	◆		◆				
European starling <i>Sturnus vulgaris</i>								◆	◆	◆
Orange-crowned warbler <i>Overmivora celata</i>					◆					
Black-throated Gray Warbler <i>Dendroica nigrescens</i>					◆		◆			
Lucy's warbler <i>Vermivora luciae</i>					◆	◆				
Yellow warbler <i>Dendroica petechia</i>					◆					
Common yellowthroat <i>Geothlypis trichas</i>					◆					
Yellow-breasted chat <i>Icteria virens</i>					◆					
Summer tanager <i>Piranga rubra</i>					◆					
Abert's towhee <i>Pipilo aberti</i>					◆	◆				
Canyon towhee <i>Pipilo fuscus</i>			◆	◆		◆				
Green-tailed towhee <i>Pipilo chlorurus</i>					◆			◆		
Rufous-winged sparrow <i>Aimophila carpalis</i>		◆								
Cassin's sparrow <i>Aimophila cassinii</i>		◆								
Rufous-crowned sparrow <i>Aimophila ruficeps</i>		◆								
Chipping sparrow <i>Spizella passerina</i>					◆			◆		
Brewer's sparrow <i>Spizella breweri</i>	◆									

Common Name Scientific Name	Valley Lower Sonoran Desertscrub	Vekol Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriapian	Mesquite Bosque	Agriculture	Developed	Industrial
Black-chinned sparrow (winter) <i>Spizella atrogularis</i>	◆		◆							
Vesper sparrow <i>Pooecetes gramineus</i>	◆	◆						◆		
Black-throated sparrow <i>Amphispiza bilineata</i>	◆		◆	◆	◆	◆	◆			
Sage sparrow <i>Amphispiza belli</i>	◆		◆							
Savannah sparrow <i>Passerculus sandwichensis</i>					◆			◆		
Song sparrow <i>Melospiza melodia</i>					◆					
Lincoln's sparrow <i>Melospiza lincolni</i>					◆			◆		
White-crowned sparrow <i>Zonotrichia leucophrys</i>	◆		◆	◆	◆	◆	◆	◆	◆	
Dark-eyed junco (winter) <i>Junco hyemalis</i>					◆			◆	◆	
Northern cardinal <i>Cardinalis cardinalis</i>			◆	◆	◆	◆				
Pyrrhuloxia <i>Cardinalis sinuatus</i>			◆	◆		◆				
Blue grosbeak <i>Guiraca caerulea</i>					◆	◆				
Varied bunting <i>Passerina versicolor</i>		◆								
Red-winged blackbird <i>Agelaius phoeniceus</i>					◆			◆		
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>					◆			◆		
Western meadowlark <i>Sturnella neglecta</i>					◆			◆		
Brewer's blackbird (winter) <i>Euphagus cyanocephalus</i>								◆	◆	◆
Brown-headed cowbird <i>Molothrus ater</i>					◆			◆	◆	
Bronzed cowbird <i>Molothrus aeneus</i>					◆			◆	◆	
Great-tailed grackle <i>Quiscalus mexicanus</i>								◆	◆	◆
Hooded oriole <i>Icterus cucullatus</i>					◆	◆				
Bullock's oriole <i>Icterus bullockii</i>					◆					

Common Name <i>Scientific Name</i>	Valley Lower Sonoran Desertscrub	Lower Valley Lower Sonoran Desertscrub	Bajada Upper Sonoran Desertscrub	Mountain Upper Sonoran and other habitats	Riparian	Xeroriparian	Mesquite Bosque	Agriculture	Developed	Industrial
Scott's oriole <i>Icterus parisorum</i>			◆	◆		◆				
House finch <i>Carpodacus mexicanus</i>	◆		◆	◆	◆	◆	◆	◆	◆	◆
Lesser goldfinch <i>Carduelis psaltria</i>					◆	◆				
Lawrence's goldfinch <i>Carduelis lawrencei</i>					◆			◆		
American goldfinch <i>Carduelis tristis</i>					◆			◆	◆	
House sparrow <i>Passer domesticus</i>								◆	◆	◆



APPENDIX B

MAJOR LAND HOLDINGS AND LANDOWNERS

Appendix B

Major Land Holdings and Landowners

1. Ace PSP LLC
2. Airport and Ocotillo LLC
3. Antelope Peak Investments LLC
4. State of Arizona
5. State of Arizona Department of Health Services
6. Bhandhusavee Rumbha Trust
7. Block Donald B Trust
8. Bob Lueck Farms LLC
9. Bright Living Trust
10. C & S Rainbow LLC
11. Chandler Heights & Cotton Lane LLC 12, CY
Desert Land LLC
12. Edwards Nadine R Trust
13. Engle/Sunbelt LLC
14. Fahey William D/Jeanne A Trust
15. Flood Control District of Maricopa County
16. Ghaswala D/N TR/Cherry Properties LLC 18,
GMW Enterprises Inc
17. Governor Gila River Indian Community Etal
Trust
18. HE Capital KR LLC
19. Homestead Properties II LLC
20. Jam Praveen Trust/TOTRR Inc.
21. Johnson Otis Trust/Charlie Mae/Beulah/Etal
22. Kaben LLC
23. Langley Vekol Valley LLC
24. Lost Horse Peak LLC
25. Lufthansa German Airlines
26. LVL/Buckeye LLC
27. Madeira Maricopa LLC
28. Maricopa County Highway Department
29. Maricopa County
30. Maricopa County Parks and Recreation
31. Morandi Randall Trust/Etal
32. Narrahill LLC
33. New River Sod Company of Arizona 36, NIX
Project II Partnership
34. NNP III EMR 3 LLC
35. NNP III Estrella Mountain Ranch LLC
36. Patterson Derby LLC
37. Phoenix Speedway Corporation
38. Polsenberg D F/Adrienne O/DH Financial/Etal
39. Pravorne Gary M TR/Barry 0 Trust
40. Queen Creek Road Farms 260 LLC
41. Rainbow 276 Arizona LLC
42. Rainbow I LLC/B Bar G Farms Limited Partners
46, Rainbow Valley Investment Group
43. Richard Behrens Buckeye LLC
44. RMG - VEF Chandler Heights LLC
45. Sahnan Sabeen Kamai/Sandeep Kaur/Sunil Dave
46. Schumacher Terry M Trust
47. Sierra Blanca Investments LLC
48. Sonoran Monument Holdings II LLC
49. Sonoran Monument Holdings LLC
50. Sonoran Valley Property LLC
51. Sonoran Valley Property LLC/Etal
52. Stewart Title and Trust of Phoenix Inc. Trust
53. Sun MP LLC
54. Triple Siete LLC
55. Tuthill and Germann LLC
56. Tuthill and Ocotillo LLC
57. United States of America
58. Villages At Estrella Mountain Ranch
Community 63, Waste Management of Arizona
Inc.
59. Willinger Family Partnership
60. Wrublik Childrens Holding LLC



APPENDIX C

**PHOTOGRAPHIC EXAMPLES OF
FUTURE LANDSCAPE CHARACTER UNITS**

Future Landscape Character Units

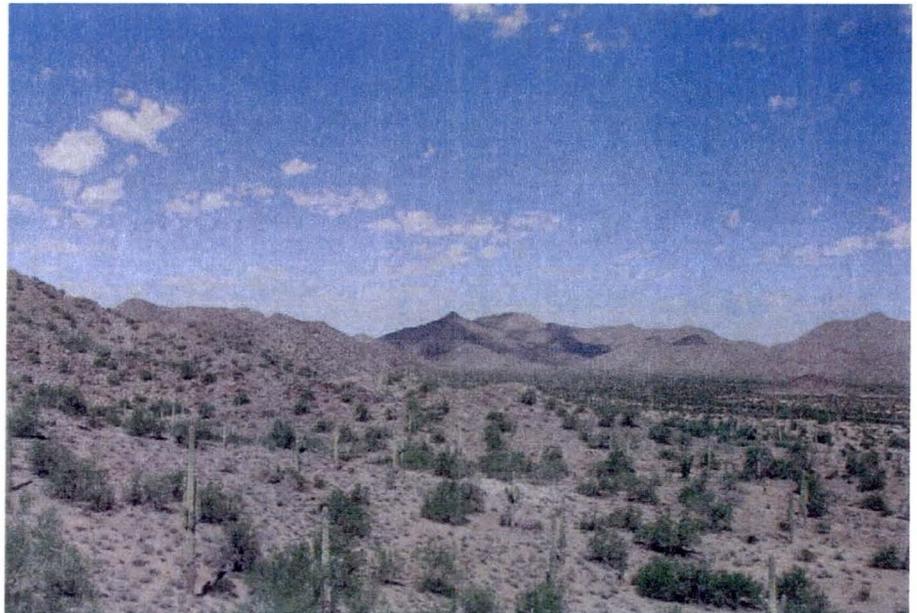
Sonoran Desert Landscape Character Type Units

Sonoran Mountain Lands Landscape Character Units

Natural Mountains

The Natural Mountains landscape character unit within the Rainbow Valley study area is expected to comprise approximately 45,585 acres, or 13.8 percent, of the study area in the future condition.

Examples of this unit include the Sierra-Estrella Mountains, which form the eastern border of the study area, and the Maricopa Mountain Range that form the west and south boundaries of the study area.



Rural Mountains

The Rural Mountains landscape character unit within the Rainbow Valley study area is expected to comprise approximately 250 acres, or 0.08 percent, of the study area in the future condition.

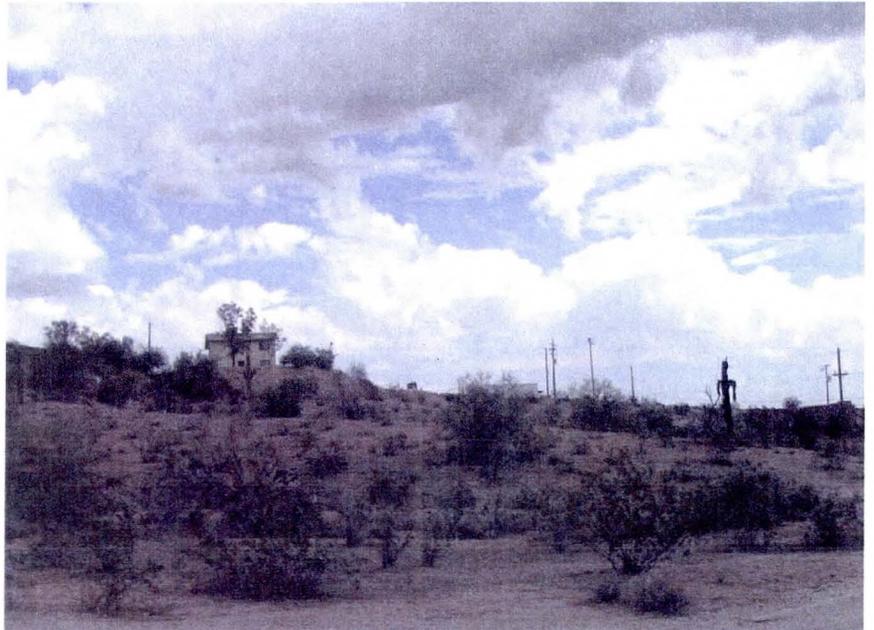
Examples of this unit include the large area just east of the Butterfield Station Landfill. Most other occurrences in the study area are associated with small areas where land ownership associated with rural development is found at the base of the mountains.



Rural Foothills

The Rural Foothills Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 538 acres, or 0.16 percent, of the study area in the future condition.

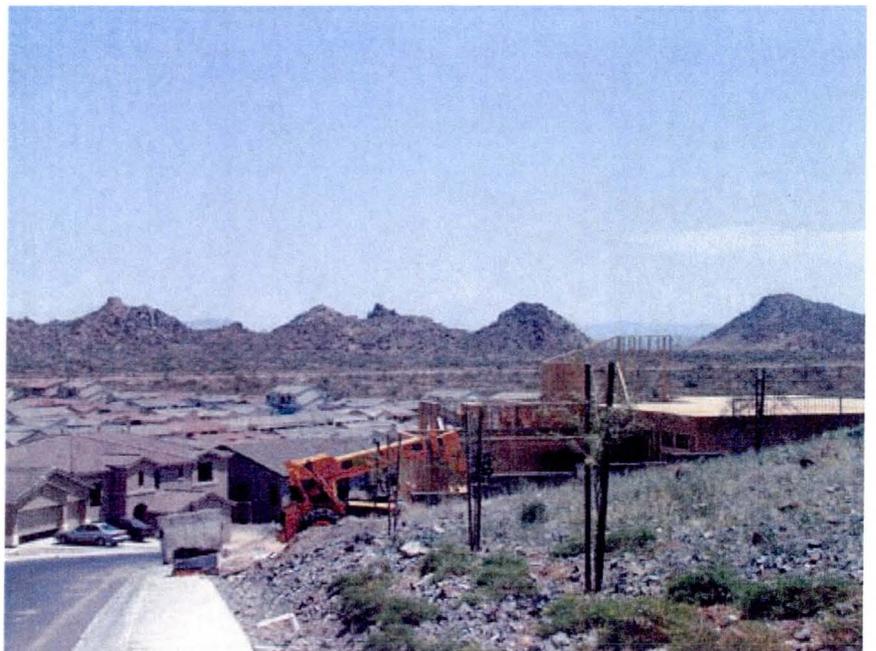
Examples of this unit are predicted to occur in the Town of Buckeye in the Buckeye Hills, in areas being planned by the Estrella Development in the northern area of the study area, as well as a small number of scattered occurrences throughout the Foothills Physical Setting.



Suburban Foothills

The Suburban Foothills Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 1,170 acres, or 0.35 percent, of the study area in the future condition.

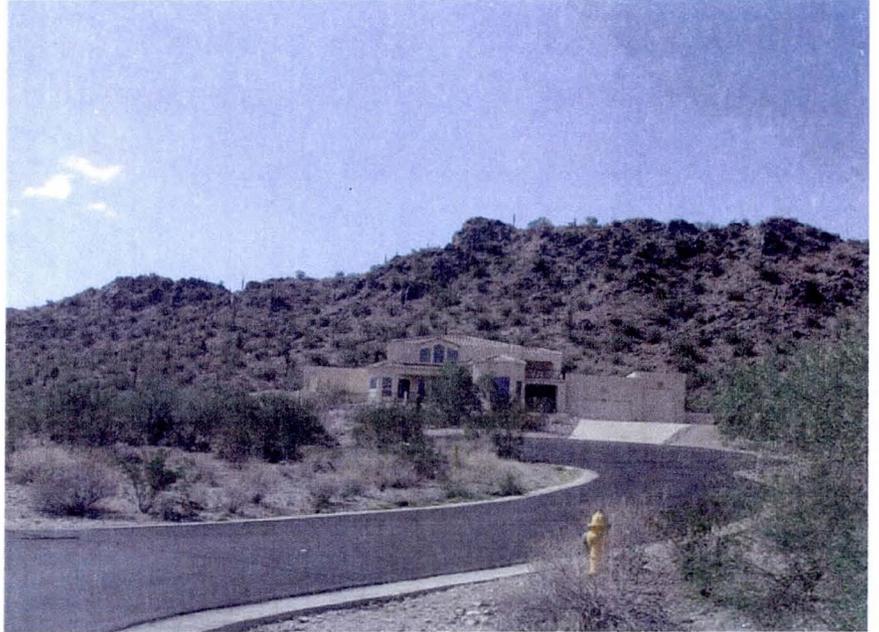
The primary expected occurrences of this unit are predicted to occur in areas being planned by the Estrella Development in the northern area of the study area, as well as a small number of scattered developments throughout the Foothills Physical Setting.



Suburban Mountains

The Suburban Mountains landscape character unit within the Rainbow Valley study area is expected to comprise approximately 358 acres, or 0.11 percent, of the study area in the future condition.

Examples of this unit are primarily associated with the future development around the Estrella Development and PIR, both located in the north-east corner of the RVADMP Study Area.



Urban Mountains

The application of the Urban Cultural Setting to the Mountain Physical Setting, though identified in the mapping process, is highly unlikely to produce a Landscape Character Unit that would differ from either the Natural Mountains or Suburban Mountains in visual character. This landscape character unit is usually produced as a result of landownership data in the less steep physical settings of the bajada continuing onto the higher elevations of the mountain lands. An existing example of this occurs in the study area at the PIR where a significant urban structure and its associated development lie at the base of the northern slopes of the Sierra-Estrella Mountains. This existing occurrence is the only one predicted in the future condition through the scenery resource analysis process. The visual character of the Natural or Suburban Mountains should be considered the most context sensitive when planning or designing facilities in this area.



Industrial Mountains

The Industrial Mountains landscape character unit within the Rainbow Valley study area is expected to comprise approximately 2 acres, or less than 0.01 percent, of the study area in the future condition.

This single occurrence is associated with an existing gravel mining operation in the Buckeye Hills that encroaches up the foothills into the mountains.



Natural Foothills

The Natural Foothills Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 5,617 acres, or 1.7 percent, of the study area in the future condition.

Examples of this unit are found in the Estrella Mountain Regional Park, at the higher elevations of the scattered foothills throughout the study area, and within the Sonoran Desert National Monument along the base of the Maricopa Mountains.



Urban Foothills

The Urban Foothills Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 109 acres, or 0.03 percent, of the study area in the future condition.

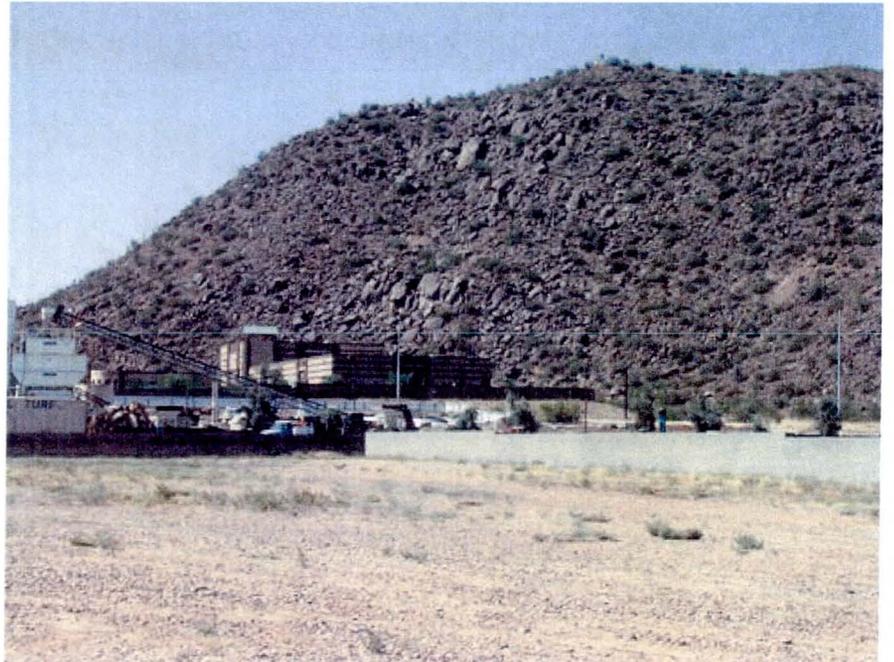
The primary occurrences of this unit are predicted to be associated with the downtown core areas being planned by the Estrella Development in the northern area of the study area and as part of PIR.



Industrial Foothills

The Industrial Foothills Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 7 acres, or less than 0.01 percent, of the study area in the future condition.

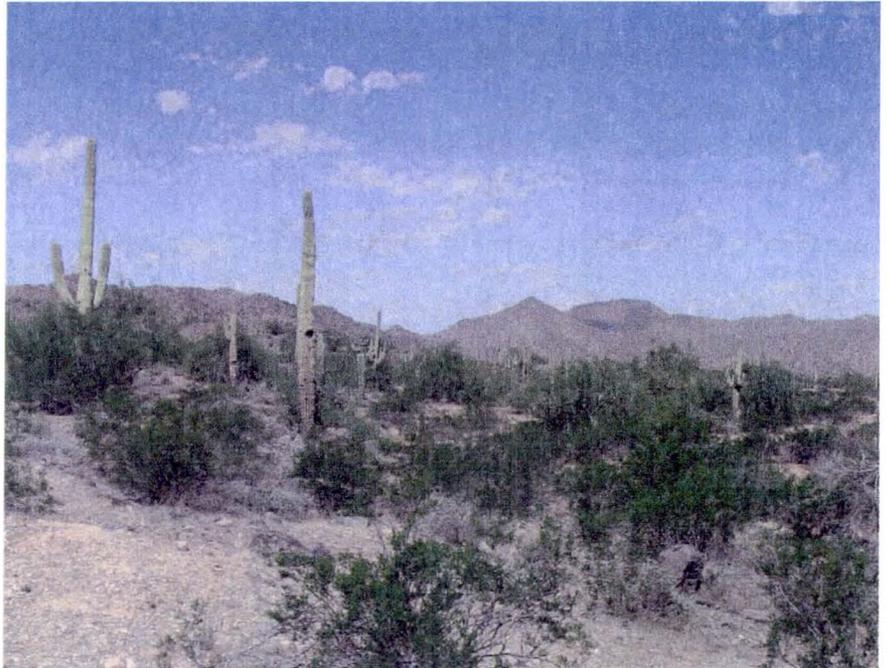
This single occurrence is associated with an existing gravel mining operation in the Buckeye Hills that encroaches up the foothills into the mountains.



Natural Upper Bajada

The Natural Upper Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 51,494 acres, or 15.6 percent, of the study area in the future condition.

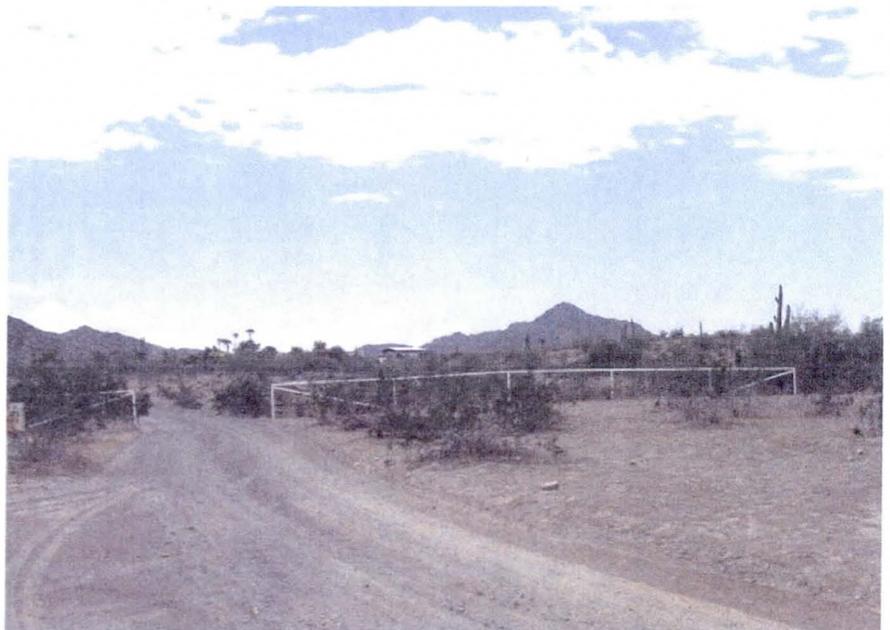
Examples of this unit are found in the Estrella Mountain Regional Park and within the Sonoran Desert National Monument along the base of the Maricopa Mountains. The large distribution of this landscape character unit in the future condition is associated with the protected status of the many wilderness areas, the county park, and the national monument. This protection prevents many areas from being developed that otherwise may be.



Rural Upper Bajada

The Rural Upper Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 3,554 acres, or 1.08 percent, of the study area in the future condition.

The largest examples of this unit are predicted to occur near the Town of Buckeye adjacent to the Buckeye Hills, but scattered occurrences can be found throughout the study area.



Suburban Upper Bajada

The Suburban Upper Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 4,756 acres, or 1.44 percent, of the study area in the future condition.

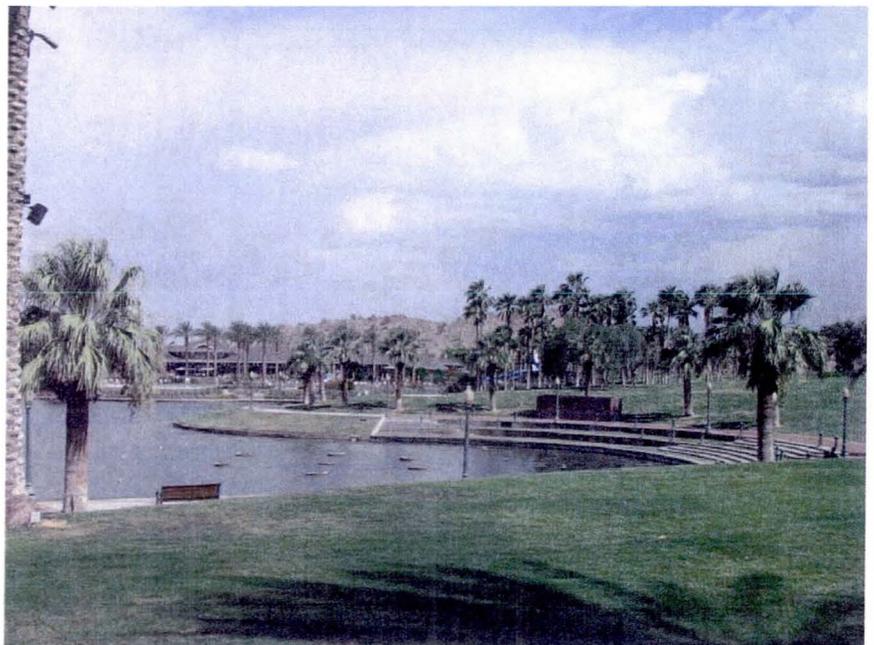
The primary expected occurrences of this unit are predicted in areas being planned by the Estrella Development in the northern area of the study area, adjacent to the already developed Upper Bajada found in the Estrella Development. Other predicted occurrences can be found associated with developments throughout the study area along the upper elevations above the valley floor. These future developments form a corridor that follows the Waterman Wash alignment.



Urban Upper Bajada

The Urban Upper Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 963 acres, or 0.29 percent, of the study area in the future condition.

The primary expected occurrences of this unit are in areas being planned by the Estrella Development in the northern portions of the study area, adjacent to the already developed Upper Bajada found in the Estrella Development. The remaining areas of urban development are associated with the PIR.



Industrial Upper Bajada

The Industrial Upper Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 19 acres, or less than 0.01 percent, of the study area in the future condition.

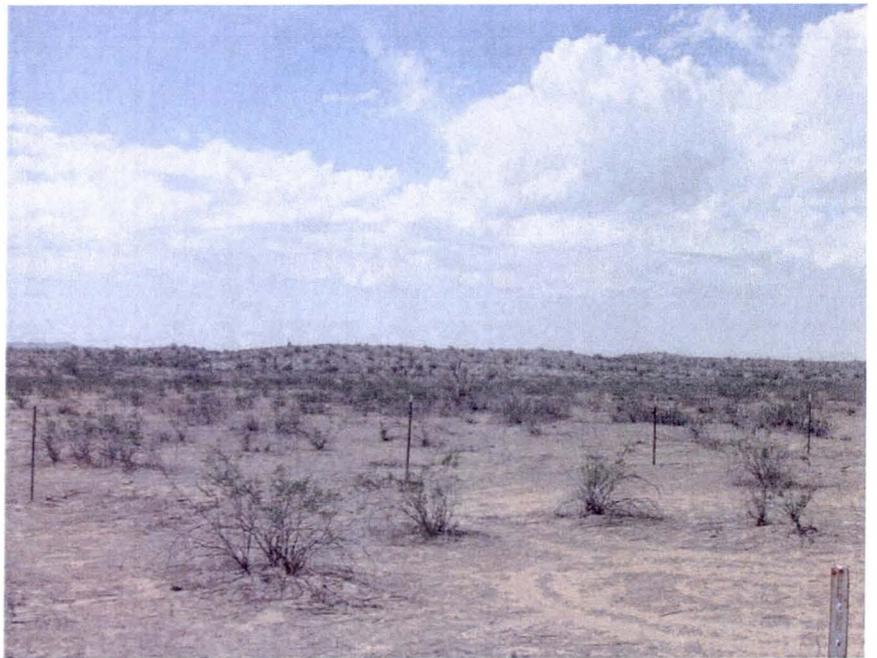
This single occurrence is associated with an existing gravel mining operation in the Buckeye Hills that encroaches up the foothills into the mountains.



Natural Lower Bajada

The Natural Lower Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 36,797 acres, or 11.2 percent, of the study area in the future condition.

Examples of this unit are found in the Estrella Mountain Regional Park, the Sierra-Estrella Wilderness Area, and within the Sonoran Desert National Monument along the base of the Maricopa Mountains. Like the Natural Upper Bajada, much of the distribution of this landscape character unit in the future condition is associated with the protected status of the many wilderness areas, the county park, and the national monument. This protection prevents many areas from being developed that otherwise may be.



Rural Lower Bajada

The Rural Lower Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 10,623 acres, or 3.22 percent, of the study area in the future condition.

The largest examples of this unit are predicted to occur near the Town of Buckeye adjacent to the Buckeye Hills and within the Vekol Valley, but scattered occurrences can be found throughout the study area.



Suburban Lower Bajada

The Suburban Lower Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 7,797 acres, or 2.36 percent, of the study area in the future condition.

The primary expected occurrences of this unit are in areas being planned by the Estrella Development in the northern area of the study area, adjacent to the already developed Upper Bajada found in the Estrella Mountain Ranch Development. Other predicted occurrences can be found associated with Montage Holdings' Amaranth development, near the Butterfield Station Landfill, as well as other developments throughout the study area adjacent to the valley floor. These future developments form a corridor that follows the Waterman Wash alignment.



Urban Lower Bajada

The Urban Lower Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 471 acres, or 0.14 percent, of the study area in the future condition.

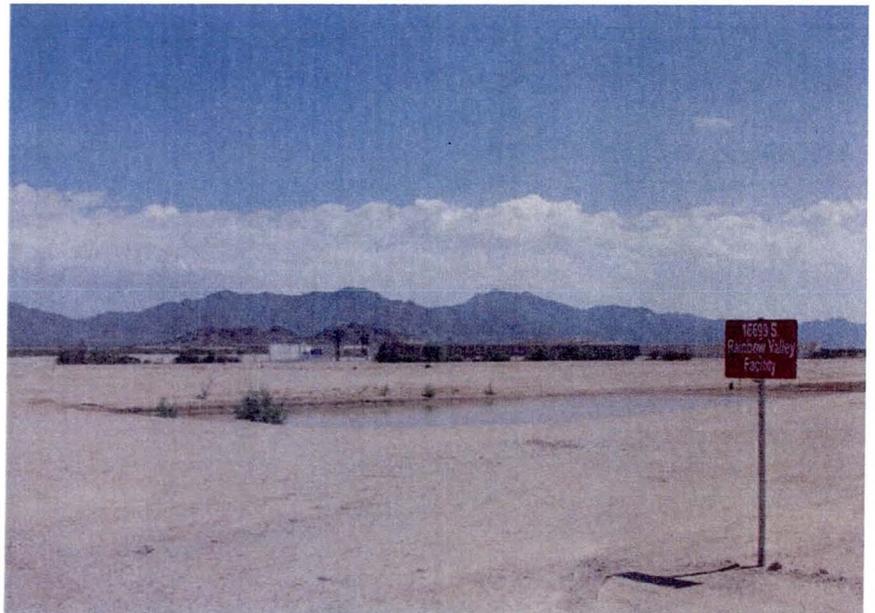
The primary expected occurrences of this unit are in areas being planned by the Estrella Development in the northern portions of the study area, adjacent to the already developed Upper Bajada found in the Estrella Development.



Industrial Lower Bajada

The Industrial Lower Bajada Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 34 acres, or 0.01 percent, of the study area in the future condition.

The one known single occurrence is associated with a water treatment facility south of the City of Goodyear.



Natural Arroyo

The Natural Arroyo Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 3,376 acres, or 1.02 percent, of the study area in the future condition.

Examples of this unit are found throughout the Estrella Mountain Regional Park, within the Sonoran Desert National Monument along the base of the Maricopa Mountains, and in the many small tributaries that make their way through the bajada downstream towards Waterman Wash. Many of these arroyos are located within the county park, the wilderness areas, as well as the higher

elevations of the Sonoran Desert National Monument. Arroyos outside of these protected areas typically show significant disturbance from Off-Highway Vehicle (OHV) users.



Rural Arroyo

The Rural Arroyo Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 390 acres, or 0.12 percent, of the study area in the future condition.

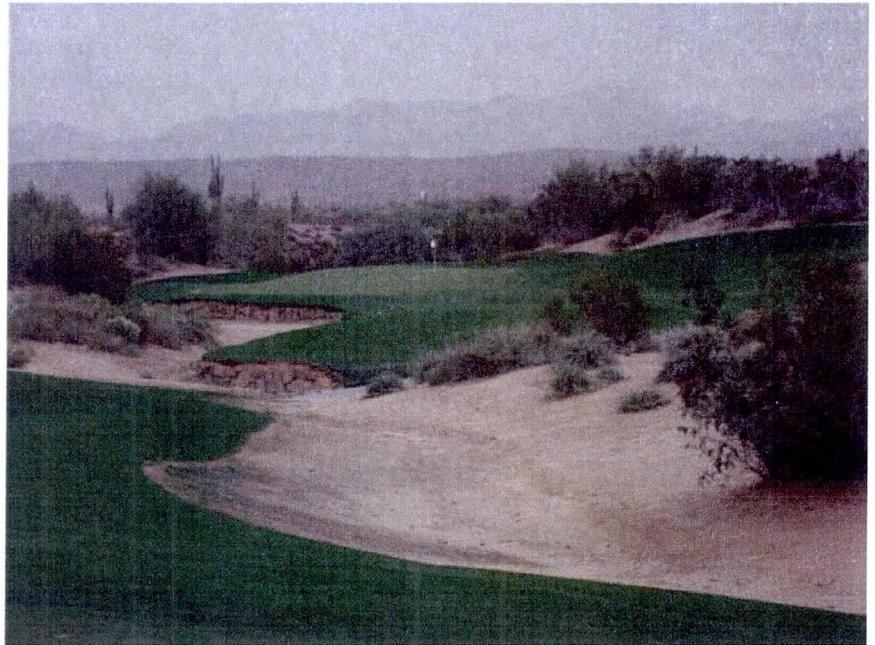
Examples of this unit are found throughout the study area anywhere there is rural development next to an arroyo in the Sonoran Mountain Lands Landscape Character Sub-Type.



Suburban Arroyo

The Suburban Arroyo Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 321 acres, or 0.10 percent, of the study area in the future condition.

Examples of this unit are found throughout the study area anywhere there is suburban development next to an arroyo in the Sonoran Mountain Lands Landscape Character Sub-Type.



Urban Arroyo

The Urban Arroyo Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 38 acres, or 0.01 percent, of the study area in the future condition.

Examples of this unit are typically associated with urban development along arroyos in the Upper- and Lower Bajada Landscape Character Types. In most cases, the Urban Arroyo is similar to the Natural and Suburban Arroyo in terms of visual elements due to the arroyo being preserved to minimize impacts to the drainage. The Urban Arroyo can be found throughout the study area anywhere there is urban development next to an arroyo in the Sonoran Mountain Lands Landscape Character Sub-Type.

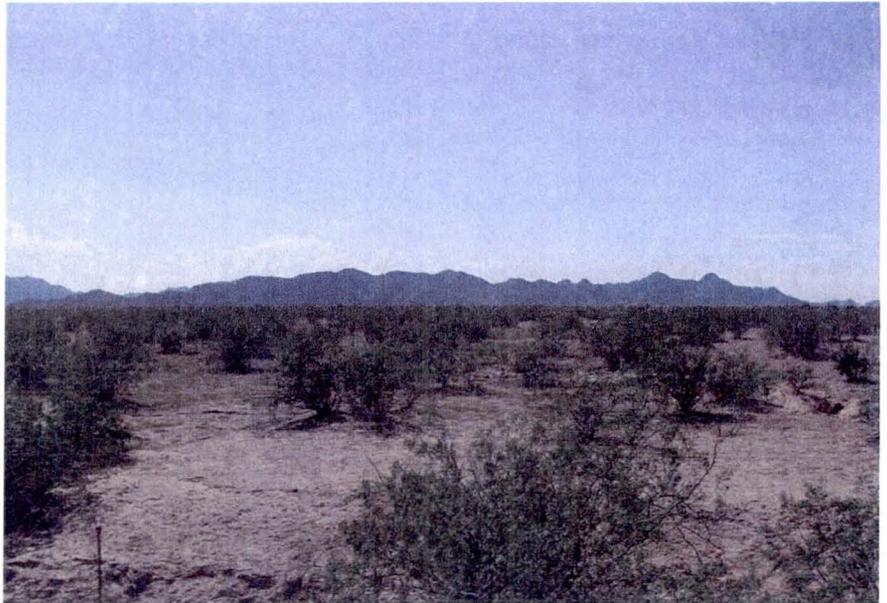


Sonoran Valley Lands Landscape Character Units

Natural Valley Plains

The Natural Valley Plains Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 77,499 acres, or 23.49 percent, of the study area in the future condition.

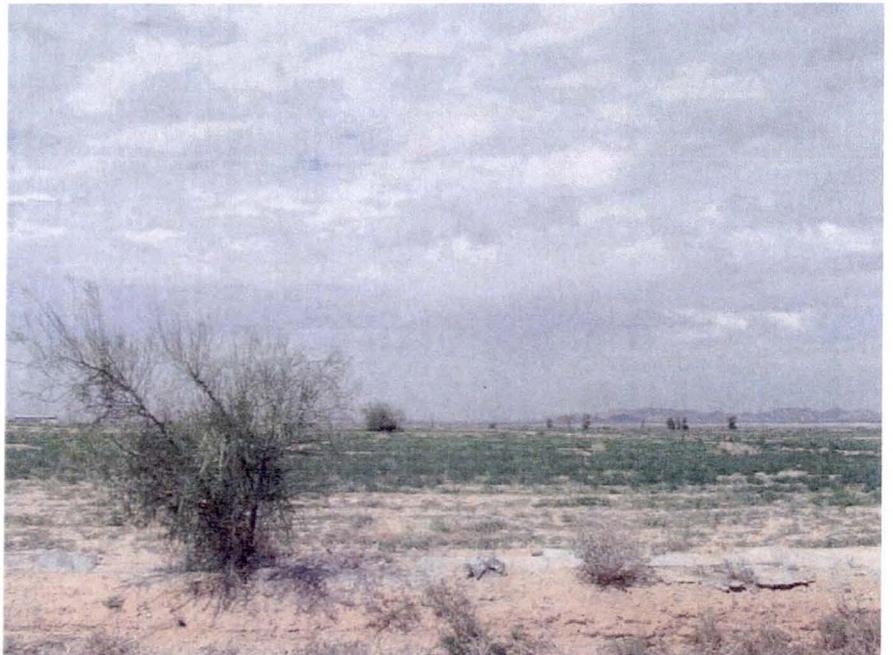
The major examples of this unit are found within the Sonoran Desert National Monument along the base of the Maricopa Mountains. The other large contiguous area of undeveloped valley plains is predicted to occur between the Amaranth and Estrella Developments along Waterman Wash in the center of the study area, connecting the Sonoran Desert National Monument to the Sierra Estrella Mountains. Other, smaller areas of Natural Valley Plains are predicted to be located along the fringe of the various planned developments.



Rural Valley Plains

The Rural Valley Plains Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 23,717 acres, or 7.19 percent, of the study area in the future condition.

The major examples of this unit are located in the outlying areas of the Estrella Development, Amaranth, and the Cimerron Development in the Vekol Valley. These units can reflect a range of development from traditional farmland to areas with single family housing on large lots.



Suburban Valley Plains

The Suburban Valley Plains Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 38,895 acres, or 11.79 percent, of the study area in the future condition.

The major examples of this unit are associated with the planned Estrella and Amaranth Developments. These occur primarily along the valley floor adjacent to Waterman Wash, and form a rough north-west to south-east running corridor along the wash that extends south beyond Maricopa Road.



Urban Valley Plains

The Urban Valley Plains Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 4,676 acres, or 1.42 percent, of the study area in the future condition.

The major examples of this unit are associated with the planned commercial and social core areas of the Estrella and Amaranth Developments. These occur primarily in clusters along the valley floor adjacent to Waterman Wash, and form a rough north-west to south-east running corridor along the wash that extends south beyond Maricopa Road.



Industrial Valley Plains

The Industrial Valley Plains Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 2,080 acres, or 0.63 percent, of the study area in the future condition.

The major examples of this unit include the Butterfield Station Landfill, the Envirotech Industries tire recycling facility in the south-central portion of the study area north of Maricopa Road, and a small rural airport near the landfill.



Natural Valley Wash

The Natural Valley Wash Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 43 acres, or 0.01 percent, of the study area in the future condition.

The most prominent example of this unit is Waterman Wash, which forms the central drainage for the Rainbow Valley watershed, flowing from the south boundary of the study area north and draining into the Gila River near the Town of Buckeye. Though natural in character, Waterman Wash has many areas where OHV and other intrusive activities have modified the visual character associated with the Natural Valley Wash Landscape Character Unit to some extent. Other natural washes are found throughout the study area, primarily as tributaries of Waterman Wash. Many occur within the Sonoran Desert National Monument along the base of the Maricopa Mountains where they are currently protected from OHV intrusion.



Rural Valley Wash

The Rural Valley Wash Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 539 acres, or 0.16 percent, of the study area in the future condition.

Most examples of this unit occur when Waterman Wash, or more likely one of its tributary washes, crosses an area predicted as Rural Valley Plains. These areas can be found throughout the study area where the Rural Valley Plains Landscape Character Unit occurs.



Suburban Valley Wash

The Suburban Valley Wash Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 716 acres, or 0.22 percent, of the study area in the future condition.

Most examples of this unit occur when Waterman Wash, or one of its tributary washes, crosses an area predicted as Suburban Valley Plains. These areas are primarily associated where Waterman Wash crosses the Amaranth Development area. The City of Goodyear has designated the areas where Waterman Wash crosses the City's Planning Area as open space, resulting in Natural Valley Wash Landscape Character Units in those areas.



Urban Valley Wash

The Urban Valley Wash Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 37 acres, or 0.01 percent, of the study area in the future condition.

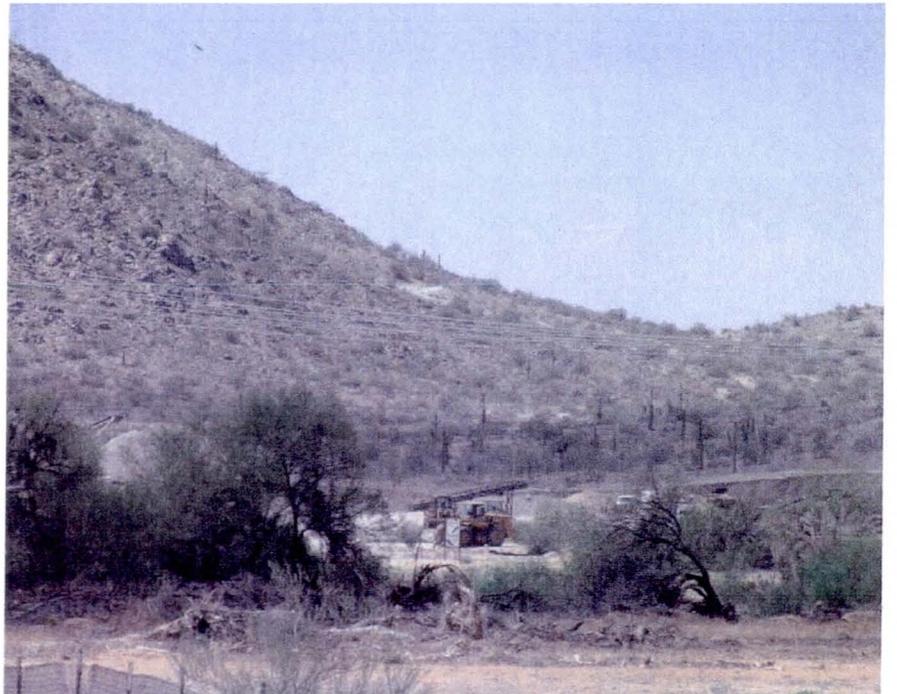
Examples of this unit may be found throughout the study area anywhere there is urban development next to a wash in the Sonoran Valley Lands Landscape Character Sub-Type.



Industrial Valley Wash

The Industrial Valley Wash Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 42.9 acres, or 0.01 percent, of the study area in the future condition.

Examples of this unit may be found throughout the study area anywhere there is industrial development next to a wash in the Sonoran Valley Lands Landscape Character Sub-Type. The one known example in the existing condition is associated with a gravel mining operation located at the base of Buckeye Hills that encroaches into a tributary wash to Waterman Wash. Other future examples are predicted to occur near Butterfield Station Landfill, as well as at the southwest corner of the airport where Waterman Wash crosses the entrance road.



Sonoran River Lands Landscape Character Units

Natural River Terrace

The Natural River Terrace Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 591.2 acres, or 0.18 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and occurs at intervals along the river between areas of predicted development.



Rural River Terrace

The Rural River Terrace Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 272.5 acres, or 0.08 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and will occur where rural development extends into the River Terrace Physical Setting.



Suburban River Terrace

The Suburban River Terrace Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 694 acres, or 0.21 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and will occur where suburban development associated with the Estrella Development and PIR extends into the River Terrace Physical Setting.



Urban River Terrace

The Urban River Terrace Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 91 acres, or 0.03 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and is predicted to occur where future urban development associated with PIR extends into the River Terrace Physical Setting.



Industrial River Terrace

The Industrial River Terrace Landscape Character Unit within the Rainbow Valley study area is expected to comprise less than 1 acre, or less than 0.01 percent, of the study area in the future condition.

Throughout Maricopa County, this landscape character unit is most commonly associated with gravel mining operations along the many rivers in the County. While only a small portion of this landscape character unit is predicted in the future associated with the Gila River, other unforeseen occurrences are likely to be associated with this type of modification to the Natural River Terrace.



Natural River Channel

The Natural River Channel Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 1,286 acres, or 0.39 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River along the north boundary of the RVADMP Study Area. Unlike many rivers in Maricopa County, the Gila River is a perennial river and contains flows year round, which greatly influences its visual character and distinguishes it from the ephemeral river lands. For this reason, when referring to the more detailed landscape character unit description in the appendixes, descriptions of meso-riparian, and occasionally hydro-riparian, waterways best describe this Landscape Character Unit as it exists within the study area.



Rural River Channel

The Rural River Channel Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 107 acres, or 0.03 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and will occur where rural development extends into the flood plains associated with the River Channel Physical Setting. Because of the risk of inundation, development in this Landscape Character Unit is typically minimal.



Suburban River Channel

The Suburban River Channel Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 172 acres, or 0.05 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and will occur where suburban development extends into the flood plains associated with the River Channel Physical Setting. Because of the risk of inundation, development in this Landscape Character Unit is typically minimal.



Urban River Channel

The Urban River Channel Landscape Character Unit within the Rainbow Valley study area is expected to comprise approximately 3 acres, or less than 0.01 percent, of the study area in the future condition.

This landscape character unit is associated with the Gila River, and is predicted to occur where future urban development associated with PIR extends into the floodplains associated with the River Channel Physical Setting.





APPENDIX D

FLOOD HAZARD AND EFFECTIVENESS ANALYSIS

APPENDIX D

Flood Hazard Context and Effectiveness Matrices

Flood Hazard Tables

Table 1: Numerical Flood Hazard Ratings

Flow Characteristics	Cultural Setting				
	Natural	Rural	Suburban	Urban	Industrial
Alluvial Fans	0	5	10	15	15
Sheet Flow/Disturbed Areas	0	2	4	6	6
Major Rivers and Tributaries	0	4	8	12	12
Stock Ponds	0	2	4	6	6
Piedmont Tributaries	0	3	6	9	9
Piedmont Distributary Flows	0	4	8	12	12
Mountain Slopes	0	1	2	3	3
FRS/Dams	0	5	10	15	15

Table 2: Flood Hazard Rank

Hazard Levels	Designation	Rank
Low	L	1
Medium	M	2-3
High	H	4-5

Table 1 is a composite of the multiplication of Table 3 Hazard Level Rank x Flood Potential Rank.

Table 3: Flood Hazard Level and Potential

Flow Characteristics	Hazard Level	
	Level	Rank
Alluvial Fans	H	5
Disturbed Areas	M	2
Sheet Flooding	M	2
Major Rivers and Tributaries	H	4
Stock Ponds	M	2
Piedmont Tributaries	M	3
Piedmont Distributary Flows	H	4
Mountain Slopes	L	1
FRS/Dams	H	5

Cultural Setting

Cultural Setting	Flood Potential	
	Rank	Rank
Natural	L	0
Rural	L	1
Suburban	M	2
Urban	H	3
Industrial	H	3

Range >= 0 to 15

	min	max
Low	0	4
Medium	5	10
High	11	15

Table 4: Flood Hazard Designation

Flow Characteristics	Cultural Setting					
	Natural	Rural	Suburban	Urban	Industrial	Industrial
Mountain Slopes	L	L	L	L	L	L
Stock Ponds	L	L	L	M	M	M
Sheet Flow/Disturbed Flow	L	L	L	M	M	M
Piedmont Tributaries	L	L	M	H	H	H
Piedmont Distributary Flows	L	L	M	H	H	H
Major Rivers and Tributaries	L	M	M	H	H	H
Alluvial Fans	L	M	M	H	H	H
FRS/Dams	L	M	M	H	H	H

Results from URS Team analysis (February 4, 2009)

- The Team decided that there is no difference in Rainbow Valley between disturbed areas and sheet flow areas relative to flood hazards.
- The Team decided that in mountain areas the only development could occur on mountain slopes and not in canyons so we look at flood hazards along mountain slopes only.
- The results of Table 4 are based on the numerical ratings in Table 1.

February 18, 2009

Effectiveness Tables

Structure Type

Structure Type	Methods					
	Non-St Class 1	Und Pipe Class 2	Chan-Lev Class 3 S/M/L	Convey Chan Class 4 S/M/L	Stor Basin Class 5 S/M/L	Dam Class 6 S/M/L
Alluvial Fan	E	I	E	E	E	E
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E
Sheet Flow/Disturbed Area	E	I	E	E	E	E
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E
Mountain Slopes	E	I	I	I	I	I
Natural	E	I	I	I	I	I
Rural	E	I	I	I	I	I
Suburban	E	I	I	I	I	I
Urban	E	I	I	I	I	I
Industrial	E	I	I	I	I	I
Major Rivers & Tribs	E	I	E	E	I	E
Natural	E	I	E	E	I	E
Rural	E	I	E	E	I	E
Suburban	E	I	E	E	I	E
Urban	E	I	E	E	I	E
Industrial	E	I	E	E	I	E
Stock Ponds	E	E	E	E	E	E
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
Piedmont Tributaries	E	E	E	E	E	E
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
Piedmont Distr Flow	E	I	E	E	E	E
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E

Structure Type	Methods					
	Non-Structural	Soft Structure	Semi-soft Structure	Hard w/Aesthetics	Semi Hard	Hard Structure
Alluvial Fan	E	I	E	E	E	E
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E
Sheet Flow/Disturbed Area	E	E	E	E	E	E
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
Mountain Slopes	E	I	I	E	I	E
Natural	E	I	I	E	I	E
Rural	E	I	I	E	I	E
Suburban	E	I	I	E	I	E
Urban	E	I	I	E	I	E
Industrial	E	I	I	E	I	E
Major Rivers & Tribs	E	E	E	E	E	E
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
Stock Ponds	E	E	E	E	E	E
Natural	E	E	E	E	E	E
Rural	E	E	E	E	E	E
Suburban	E	E	E	E	E	E
Urban	E	E	E	E	E	E
Industrial	E	E	E	E	E	E
Piedmont Tributaries	E	I	E	E	E	E
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E
Piedmont Distr Flow	E	I	E	E	E	E
Natural	E	I	E	E	E	E
Rural	E	I	E	E	E	E
Suburban	E	I	E	E	E	E
Urban	E	I	E	E	E	E
Industrial	E	I	E	E	E	E

I = Ineffective in providing flood protection in this cultural setting.
E = Effective in providing flood protection in this cultural setting.

We assumed that cultural setting was not significant when only evaluating flood protection and structure type.
Method effectiveness was influenced by cultural setting.