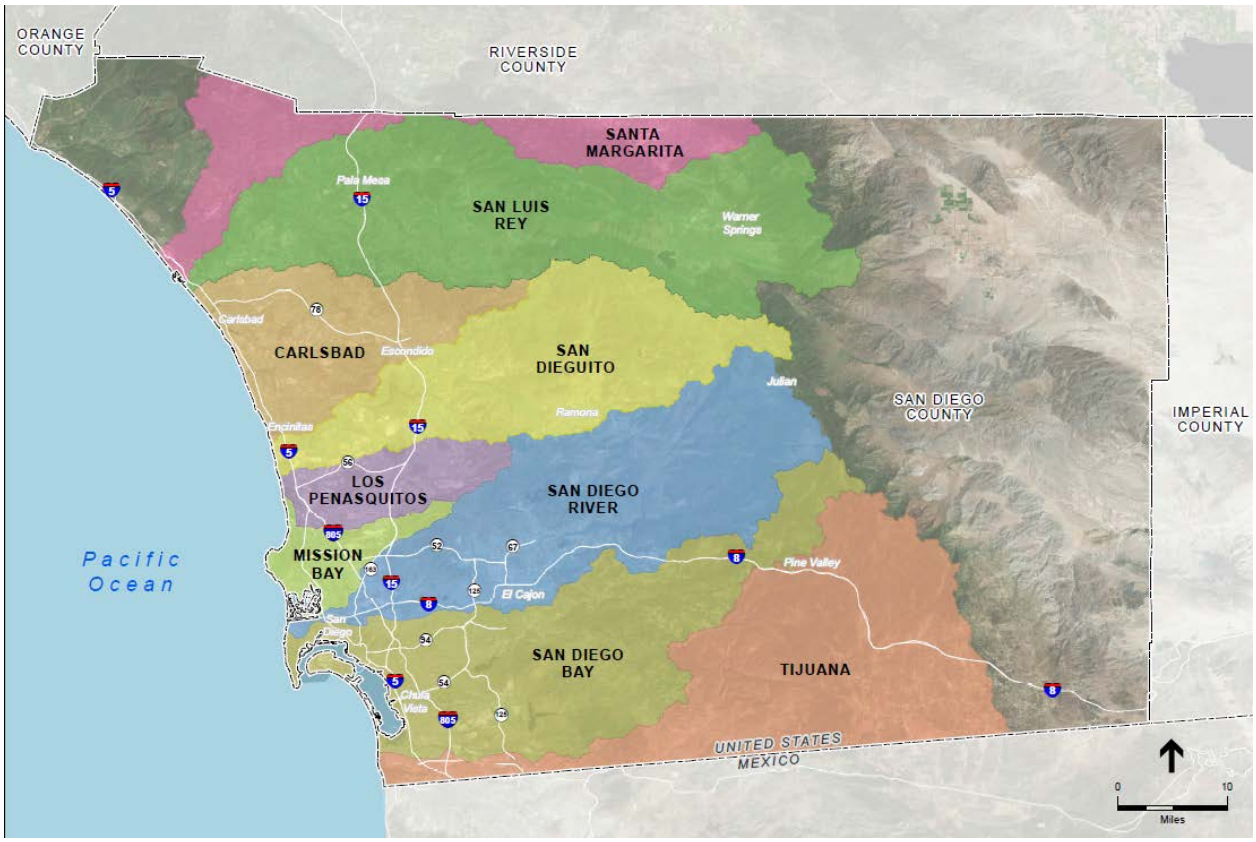
Final

San Diego Region Functionally Equivalent Storm Water Resource Plan

Prepared for
San Diego Region Copermittees
County of San Diego Public Works

June 2017

Funding Provided by
State Water Board Proposition 1 Water Planning Fund



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550 West C Street
Suite 750
San Diego, CA 92101
619.719.4200
www.esassoc.com

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EXECUTIVE SUMMARY

The San Diego Region Functionally Equivalent Storm Water Resource Plan (SWRP) has been prepared for the San Diego Region, which consists of nine Watershed Management Areas (WMAs) within San Diego County as defined by the County Municipal Storm Water Permit Order (R9-2013-0001), and contains the region's largest hydrologic units (HUs), which extend to Orange and Riverside Counties adjacent to the north and east, and into Mexico to the south. The WMAs are further composed of hydrologic areas and sub-areas that have been designated in the Municipal Storm Water Permit. All of the San Diego County WMAs drain from higher elevations in the east to coastal waters (e.g., lagoons, estuaries, bays) in the west. The upper portions of the larger WMAs are generally less populated and urbanized. As the region's rivers and creeks flow to the coastal areas, population and urbanization increase, with greater impervious surfaces and potential non-point source pollution. A greater number of State 303d listed impaired water bodies generally characterize the lower portions of the WMAs. The region's rivers and creeks are characterized by increased seasonal surface flow from rain events in the winter and spring months. During the dry season from April to September, base flows decrease significantly and rivers and creeks may become dry unless sufficient groundwater flows are present. In urbanized areas, dry-weather flows from seepage from landscape irrigation may occur. Non-storm water flows from the municipal separate storm sewer system are prohibited under the San Diego County Municipal Storm Water Permit.

Much work has been done by the San Diego Copermittees to date to define the water quality conditions in the San Diego WMAs through over ten years of monitoring and reporting. High priority water quality conditions have been defined in the Water Quality Improvement Plans (WQIPs) prepared by the Copermittees in accordance with the San Diego County Municipal Storm Water Permit. These high priority water quality conditions include fecal indicator bacteria in coastal waters and hydromodification in a number of WMAs. Additional priority water quality conditions are defined in the WQIPs. Interim and final water quality goals and the strategies and timelines to meet these goals are defined in the WQIPs for each WMA. This SWRP guides project sponsors to develop and submit projects that meet these goals and are consistent with the priorities, strategies, and timelines of the WQIPs.

A goal of the SWRP is to identify opportunities to enhance utilization of storm water as a resource. The San Diego Region has been successful in collecting and using storm water for water supply in reservoirs located in the upper elevations of several WMAs. Limited groundwater aquifers and low permeability soils have limited beneficial use of storm water in the lower more urbanized portions of the WMAs. Beneficial uses of collected storm water and dry weather flows are further assessed in the SWRP to address the goal of using storm water as a resource. This

analysis includes a public parcel assessment and a quantitative analysis of the opportunities for storm water capture and beneficial uses, including recharge into groundwater aquifers, irrigation, and diversion and treatment at an existing facility for potable use. The quantification of these opportunities was then used to assess and prioritize listed SWRP projects to assess the water supply benefit provided by these projects compared to the larger set of opportunities.

Watershed and regional plans have been developed that identify opportunities, strategies, and priority conditions and goals for water quality, water resources, flood management, community, and natural resource benefits within San Diego County. The San Diego Integrated Regional Water Management (IRWM) Plan is a regional plan that identifies water resource goals and priorities. The WQIPs, IRWM Plan, and other flood management, natural resource, and capital project plans form the basis for this SWRP.

The California State Legislature passed Senate Bill (SB) 985 requiring regions to develop SWRPs in order to receive grants for storm water and non-storm water runoff capture projects from any voter-approved bond after January 1, 2014, including the Proposition 1 bond act. The goal of a SWRP is to prioritize those storm-water-related projects that most effectively address the regional and watershed-based storm water water quality and beneficial use goals. This SWRP achieves this goal by guiding project sponsors to develop and submit projects that provide multiple benefits to maximize water supply, water quality, environmental, flood, and other community benefits, and are prioritized in existing watershed-based plans that have specific water quality and beneficial use goals for storm water and dry-weather flows. Project sponsors are further guided to develop quantitative measures to assess and demonstrate that projects meet these watershed-based goals. Storm water and dry-weather flow water quality and beneficial use projects (or projects that have these as key elements) applying for Proposition 1 grant funding must be listed in a SWRP.

The San Diego SWRP has been developed in accordance with the State Water Resources Control Board (SWRCB) SWRP Guidelines (Guidelines; December 15, 2015). Per these Guidelines, a plan can be based on existing planning documents and local ordinances as a “functionally equivalent Plan”. The San Diego SWRP is a functionally equivalent plan that uses existing regional and watershed plans, such as the WQIPs and IRWM Plan, and has been prepared in accordance with the requirements of California Water Code section 10560 et seq. The demonstration of compliance with the SWRP Guidelines is documented in the index of California Water Code requirements in the SWRP chapters that address the checklist and self-certification in Appendix A. This SWRP is a regional storm water planning document prepared in accordance with the SWRP Guidelines to encourage multi-benefit storm water, water quality, and beneficial use project development and to meet requirements for application of projects in the County of San Diego for state grant funding under Proposition 1 and other future funding opportunities.

The County of San Diego and the San Diego Municipal Separate Storm Sewer Systems (MS4) Copermittees have prepared this SWRP, which includes nine of the WMAs within the county. The SWRP approach allows for consistency across the region with project evaluation criteria, prioritization, metrics, and measurement methods described in the Guidelines. As this is a functionally equivalent SWRP that builds on existing regional and watershed plans, project

identification and development is completed through these other planning efforts. By bringing these plans together as part of this SWRP, this plan provides the tools for project sponsors to work regionally and on a watershed basis to better integrate projects that provide multiple benefits. This integration is achieved through the project integrated analysis and prioritization tools for listing in this SWRP, which are presented in Section 5 as flow charts and examples of project analysis and scoring, and in a checklist provided in Appendix E.

SWRP-listed projects will undergo an additional quantification analysis and prioritization for water quality and water supply benefits. This additional assessment compares the quantities that project sponsors provided for these benefits to the regional set of projects. An additional color scoring is provided for the storm water water quality benefit to further quantify and prioritize the listed projects. The prioritization for water quality projects provides a comparison of the level of benefit provided to the watershed goals and priorities presented in the current, applicable WQIP. For water supply projects, prioritization is based on a comparison of the storm water capture and use annual volumes with those of the larger set of opportunities identified and quantified through the public parcel assessment. This additional prioritization is incorporated into the SWRP Online Project Tracking and Integration (OPTI) system. The prioritization process can be accessed online through the IRWM OPTI system.[1]

To submit a project for inclusion in this SWRP, a project sponsor uses the three-step online SWRP project checklist. Project sponsors complete the checklist by responding to questions on project eligibility (step 1), project metrics (step 2), and watershed prioritization (step 3). More detailed discussion and examples of each of the steps and the scoring is provided in Chapter 5. The SWRP has been structured to ensure this plan remains current and provides an ongoing planning tool for the identification and development of multi-benefit projects that meet regional and watershed planning goals. Once the checklist is completed, an overall score will be generated, along with an additional color score based on the project quantities provided for projects with water quality and/or water supply as a main benefit, and the project will be listed in the SWRP project database. This can be done at any time. The project list will be continually updated as projects are identified and developed through existing watershed and regional planning documents, and added or updated using the online checklist tool. OPTI allows applicants to periodically update project information to improve the scoring and ranking of projects through greater multiple benefit integration and development of project quantitative measurements identified as project metrics. Updates can be made prior to grant solicitations by using the online system.

Additional tools to supplement existing regional and watershed plans are provided in the SWRP to identify and develop storm water capture and beneficial use opportunities through the public parcel assessment and mapping presented in Section 5.2 and Appendix H. Opportunities to consider multi-benefit stream and riparian habitat restoration and enhancement are provided in public parcel assessment and mapping tools in Appendix E. Worksheets that provide suggested

1 Available at http://irwm.rmcwater.com/sd/login.php.

methods and example calculations to determine the quantifiable measures of how a project will achieve the benefits are provided in Appendix G.

As grant solicitations through Proposition 1 are announced, project sponsors will need to check specific project eligibility and grant application requirements. The SWRP project checklist addresses the SWRP Guidelines, which cover storm water capture projects, the IRWM Program, and conservation projects with water quality elements. Additional project information is generally required in grant-specific applications. Submission of grant applications is the responsibility of the grant sponsor and is a separate effort from development of this SWRP.

The SWRP brings together regional planning on storm water management, and will be incorporated into the San Diego IRWM Plan to fulfill this need. The SWRP is integrated into the IRWM Plan through the adoption of the SWRP by the IRWM governing body (the San Diego Regional Water Management Group or RWMG). The online SWRP project checklist and listing tool is part of the IRWM regional project database. Calls for projects for future grant solicitations will be done through the IRWM outreach efforts.

CHAPTER 1
Introduction

1.1 Background – San Diego Region Functionally Equivalent Storm Water Resource Plan

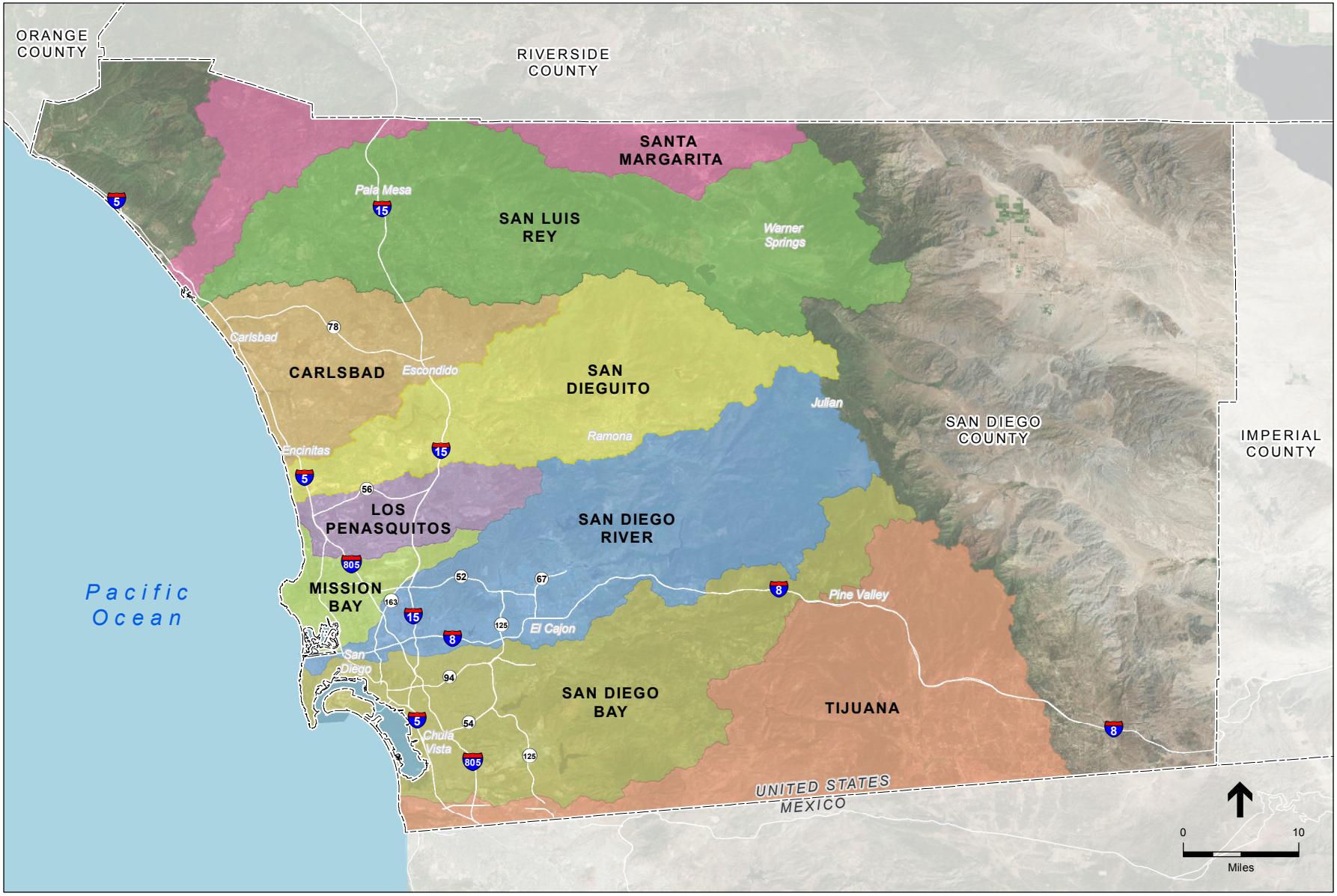
This Storm Water Resource Plan is based on the State Water Resources Control Board Guidelines adopted December 15, 2015.

http://www.waterboards.ca.gov/water_issues/programs/grants_loans/swgp/docs/prop1/swrp_finalguidelines_dec2015.pdf

On August 28, 2014, the California State Legislature passed SB 985, amending the Stormwater Resource Planning Act (Act). The Act requires regions to develop SWRPs in order to assist in developing multi-benefit storm water management solutions. The Act also requires public agencies to develop a SWRP in order to be eligible to receive grants for storm water and dry weather runoff capture projects from bond acts approved by voters after January 1, 2014. SWRPs are required to quantitatively list and prioritize projects designed to capture storm water for potential future use. Eligible projects must provide multiple benefits to maximize water supply, water quality, environmental, and other community benefits, as well as reduce the pollution storm water carries to receiving water bodies to assist agencies with compliance with applicable MS4 permits and Total Maximum Daily Loads (TMDLs).

SB 985 required the (SWRCB to promulgate guidance for compliance with the Act by July 1, 2016. The draft SWRP Guidelines were released for public comment and review in August 2015, and were brought to SWRCB for adoption in December 2015. The Guidelines serve as a blueprint for SWRCB and other bond-fund-dispensing agencies to use in determining whether an adequate SWRP has been prepared prior to the granting of funds for storm water and dry weather runoff capture projects. SWRCB adopted the Guidelines, which are the basis for the development of this SWRP, on December 15, 2015.

The County of San Diego and the San Diego MS4 Copermittees have prepared this SWRP, which includes nine of the WMAs within the county, shown in Figure 1-1. This SWRP approach allows for consistency across the region with project evaluation criteria, prioritization, metrics, and measurement methods for success described in the Guidelines. The SWRP includes WMA-specific sections that allow for presentation of watershed-specific information, determination of priority projects using the regional criteria and methods on a WMA level, and presentation of WMA-specific partners, community outreach efforts, and plan implementation and strategies.



SOURCE: ESRI, 2016; SanGIS, 2016

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Figure 1-1

Watershed Management Areas Covered Under the San Diego Region SWRP

1.2 Purpose and Objective of the SWRP

The purpose of this SWRP is to provide the tools and guidance to support the region in developing multi-benefit storm water or dry weather runoff projects to achieve watershed and regional planning goals. This SWRP provides eligible project sponsors the tools to submit multi-benefit projects for integrated analysis, prioritization, and listing in the SWRP, which will aid in regional planning and allow the projects to be eligible for grant funding under Proposition 1. These analysis and prioritization tools are not meant to exclude projects but rather to assist in developing projects that enhance utilization of storm water as a resource to achieve regional and watershed goals more effectively and to have a greater opportunity for funding. ***The objective of the SWRP is therefore to identify and prioritize projects to "bring to the top" those multi-benefit projects that can best meet the identified priorities and goals on a watershed basis, and which will also be more competitive for statewide grant funding.***

This SWRP is not a compliance plan. It is a planning document prepared in accordance with the SWRP Guidelines to be a valuable regional storm water planning document and to meet requirements for application of projects in the region for State grant funding under Proposition 1. The integrated analysis and prioritization tools (Chapter 5) follow the SWRP Guidelines.

1.3 Functional Equivalency Provided by Regional and Watershed Plans

Per the adopted Guidelines, a plan meeting the provisions of the California Water Code need not be referred to as a "Storm Water Resource Plan." An existing planning document or a collection of existing documents and local ordinances may be utilized as a "functionally equivalent Plan", including but not limited to watershed management plans, integrated resource plans, urban water management plans, green infrastructure plans, water quality improvement plans, salt and nutrient management plans, TMDL implementation plans, or similar plans that include storm water and dry weather runoff capture and use as a component of the watershed goals and objectives. The watershed approach is essential to integrate storm water management with other basic aspects of aquatic resource protection and overall water management, including flood control, water supply, and habitat conservation. If an individual planning document does not meet the standards of the California Water Code, a collection of local plans and ordinances and regional plans may constitute a functional equivalent, if the plans and ordinances collectively meet all of the requirements of California Water Code section 10560 et seq. (see Checklist and Self-Certification in Appendix A of the Guidelines).

Watershed and regional plans have been developed that identify opportunities, strategies, and priority conditions and goals for water quality, water resources, flood management, community, and natural resource benefits within San Diego County. These existing plans, shown in Figure 1-2, have been used to develop this functionally equivalent SWRP. Each of the regional and watershed plans addresses one or more of the five key benefits in accordance with the Guidelines: water quality, water resources, environment, flood risk, and community. Section 5.1 provides references and descriptions of these existing planning documents.

The documents used most extensively in this SWRP are the WQIPs developed by the San Diego County Copermittees for each WMA (see Reference Section for specific WMA WQIPs). The WQIPs identify the water quality priorities and strategies to meet water quality goals and compliance targets on a watershed basis. The WQIPs are used to address the SWRP Guidelines for Watershed Identification (Section VI.A) and Water Quality Compliance (Section V). Required watershed information is also based on the San Diego IRWM Plan (RWMG, 2013) and the Copermittees' Annual Monitoring Reports (Weston, 2009, 2010). Watershed Management Plans, where applicable, have also been used to develop this document. Jurisdictional planning documents for flood management, capital improvement projects, community development and recreational opportunities, and greenhouse gas/climate action plans also provide a foundation for this SWRP in identifying goals, strategies, and opportunities that can form the basis for multi-benefit projects. Section 5.1 describes each of these types of documents in further detail. Section 4.1 and Figure 4-1 show how the different plans are related.

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Figure 1-2
Functionally Equivalent SWRP –
Builds on Existing and Future Watershed and Regional Plans

1.4 Identification of Projects

Projects listed in the SWRP are developed and prioritized through existing regional and watershed-based plans that have defined water quality and water resource goals, strategies, and timelines. Key elements of these projects include storm water and dry weather flow water quality and beneficial use, as well as benefits that address flood, environmental, and community goals. A goal of the SWRP is to identify opportunities to enhance utilization of storm water as a resource. The San Diego Region has been successful in collecting and using storm water for water supply in reservoirs located in the upper elevations of several WMAs. In the lower, more urbanized portions of the WMAs, there tend to be limited groundwater aquifers and low permeability soils, which have less opportunity for beneficial use of storm water.

As this is a functionally equivalent SWRP that builds on existing regional and watershed plans, project identification and development is completed through existing and ongoing planning efforts and documents, such as WQIPs, the IRWM Plan, and others. Some related planning efforts and documents include the following:

- Regional best management practices (BMPs) and green infrastructure strategies and projects have been identified through the preparation of the WQIPs.
- The Watershed Management Area Analysis (WMAA; see Reference Section for specific WMA WMAAs) conducted for several watersheds in the region has further analyzed opportunities for multi-benefit water quality projects.
- The IRWM Plan has identified water resource goals and multi-benefit projects to address issues such as local water supply augmentation, water quality, flooding, and conservation.
- Flood risk management and master plans that have been developed in the region on a jurisdictional level provide identification of flood management projects that may also have multiple benefits.
- Regional and local conservation and restoration plans, including the Multi-Species Conservation Plan (MSCP) and Multiple Habitat Conservation Program (MHCP), have been developed to identify creek and wetland restoration and enhancement projects.
- Community planning documents, including master plans and jurisdictional Climate Action Plans, have identified opportunities for urban greening projects.

By bringing these plans together as part of this functionally equivalent SWRP, this plan provides the tools for project sponsors to work regionally and on a watershed basis to better integrate storm water projects that provide multiple benefits more effectively. This may include the integration of storm water water quality strategies with creek and wetland restoration projects to meet natural resource protection needs, flood management, and water quality goals identified in these watershed and regional plans. This integration is achieved through the project integrated analysis and prioritization tools for listing in this SWRP, presented in Chapter 5.

The goal of this SWRP is to provide tools and guidance for improved collaboration and integration between existing regional planning efforts and multi-benefit storm water and dry

weather flow water quality and beneficial use projects that are competitive for statewide funding. Figure 1-3 illustrates the regional and watershed plans that provide the project identification and prioritization process for the SWRP. For example, a storm water water quality project prioritized in a WQIP could provide greater watershed benefits by incorporating a prioritized community benefit that was identified in a community greening plan. As highlighted in the graphic, the main benefit area that is not fully addressed in existing plans is water supply provided by storm water and dry weather flow capture and beneficial use. The project identification and prioritization process for this main benefit is addressed in Section 5.2 through an assessment of public parcels and identification of storm water and dry weather flow capture and beneficial use opportunities.

The identification and analysis of projects under this SWRP are not driven by specific grant solicitations and calls for projects. Projects are identified through existing, updated, and future planning documents that have specific goals and timelines to meet watershed-based goals and implementation strategies. Projects that are assessed and listed on the SWRP online database (OPTI) can be updated to improve ranking through collaborative efforts between these plans to achieve additional and greater benefits. As projects are further developed through planning and design activities, updates to the projects can be made online to increase the project's ranking through the determination of project metrics that quantify the benefits achieved.

The SWRP Guidelines allow for submittal and listing of programmatic projects related to storm water and dry weather runoff. Programmatic projects may include multiple individual projects that have similar goals, elements, and benefits. Examples of programmatic projects include the implementation of a set of green street projects over several years within a high priority hydrologic area, which achieve similar water quality, flood management, and community benefits, and are identified in watershed management area WQIP implementation strategies. This type of green infrastructure project can be submitted as one programmatic project for inclusion on the SWRP list. Another example of a programmatic project is the implementation of a dry weather diversion for beneficial use to address water quality and habitat impact in a coastal lagoon along with measures in the watershed to reduce dry weather flows such as incentivizing turf replacement, installation of drip irrigation, and drought-tolerant landscaping for residential and commercial properties. This programmatic project has water quality and water resources as key elements, but also has multiple benefits that include water conservation and habitat restoration. A programmatic water quality and conservation project can be submitted though a single checklist for inclusion and scoring as a programmatic project on the SWRP project list.

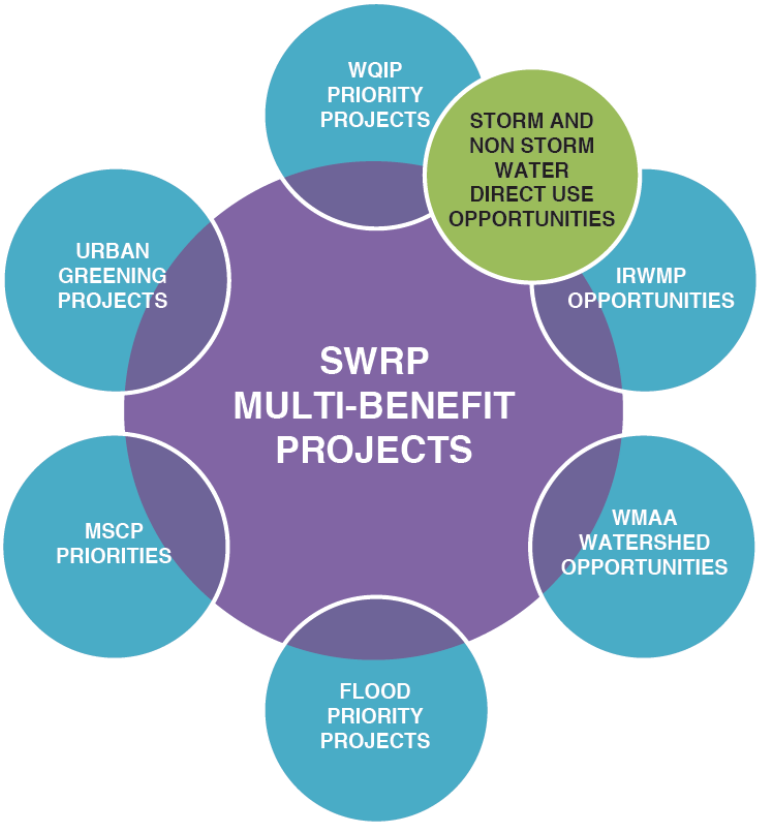

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Figure 1-3

Project Identification: Existing Watershed and Regional Plans for Storm Water and Dry Weather Flow Capture and Beneficial Use Opportunities

1.5 SWRP Project Listing and Grant Funding Opportunities

This SWRP has been structured to ensure it remains current and functions as an ongoing planning tool for the identification and development of multi-benefit projects. This is achieved by a process to identify, assess, prioritize, and list multi-benefit projects that can be updated through an online tool. This process is outlined in Figure 1-4, which shows that the current list of projects that have been assessed and prioritized in this SWRP is focused on projects for Rounds 1 and 2 of SWRCB storm water grant funding. (The Round 2 solicitation is expected in Spring 2018.) The project list will be continually updated using the online regional project integrated analysis and prioritization tool that is presented in more detail in Chapter 5.

As grant solicitations through Proposition 1 are announced, project sponsors will need to check specific project eligibility and grant application requirements. The SWRP project checklist specifically addresses the SWRP Guidelines, which covers storm water capture projects, IRWM projects, and conservation projects with water quality elements. Additional project information is

generally required in grant-specific applications. Submission of grant applications is the responsibility of the grant sponsor. The County of San Diego and Copermittees are not responsible for preparing specific grant applications or completing the online checklist for a project unless they are the project sponsor. The County of San Diego and Copermittees are also not responsible for selecting projects for inclusion on the SWRP list. Announcements for new grant solicitations and calls for projects will be done through the existing IRWM stakeholder process. Instructions will be provided in the calls for projects to complete the online SWRP project checklist that will score and list projects in the online project database[1]. The submittal of projects under this SWRP should not be driven by specific grant solicitations and calls for projects, rather through the existing, updated, and future planning documents, which have specific goals and timelines to meet watershed-based goals and implementation strategies. Projects cans be entered or updated in the SWRP online database at any time.

Proposition 1 funds for multi-benefit storm water projects will be available through two solicitations or "rounds" of funding. Approximately $80 million of Proposition 1 funds were available to fund implementation projects during the first solicitation (Round 1) and were awarded in December 2016. An additional approximately $86 million will be available to fund implementation projects during the second solicitation (Round 2) and will likely be solicited in Spring 2018. Preparation of this SWRP was initiated to identify and prioritize projects within the region for Rounds 1 and 2.

Other future funding opportunities include future rounds of SWRP funding for individual applicants, funding through the IRWM, and conservation agency funding for projects that have water quality or storm water capture elements.

As future projects (those not included in the Rounds 1 and 2 project list) are identified and developed through existing, updated, and new watershed and regional planning documents, the project sponsors will complete the project checklist using the online system. The projects will then undergo assessment, scoring, and inclusion in an updated project list. This SWRP is, therefore, adaptive to updates and modifications to watershed and regional goals in existing and new planning documents through the online process established for this SWRP.

This SWRP is integrated into the IRWM Plan through the adoption of the SWRP by the IRWM governing body (the RWMG). The online SWRP project checklist and listing tool is part of the IRWM regional project database. Calls for projects for future grant SWRP-related solicitations will be done through IRWM outreach efforts.

1 The database is available at http://irwm.rmcwater.com/sd/login.php.

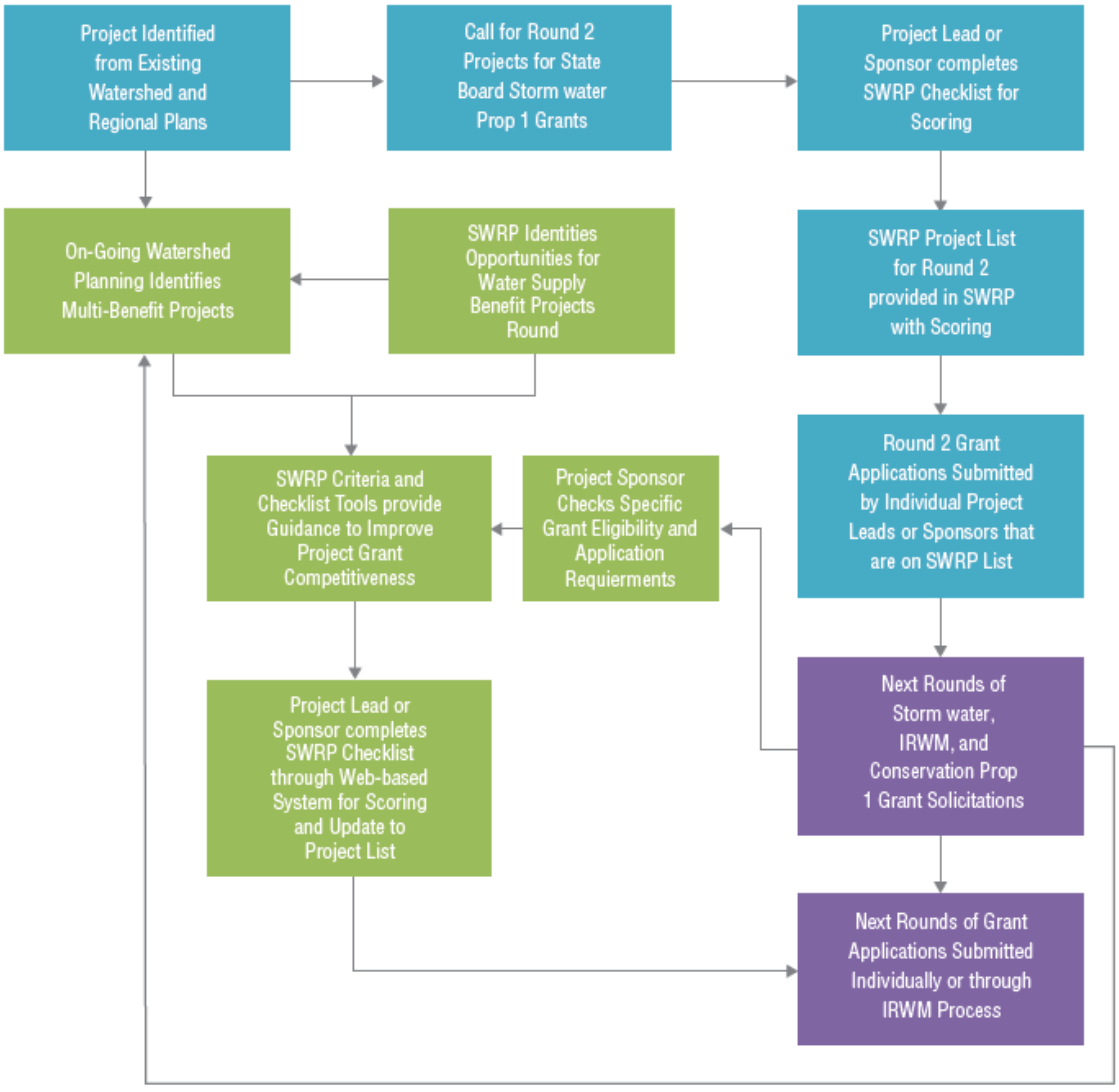

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Figure 1-4
Process for Current and Future Project Submittal for SWRP Listing and SWRP Checklist Updates

1.6 Consistency with other Plans and Policies (Section V: Standard Provisions)

Beyond the criteria and metrics of the prioritization process, project sponsors are responsible for ensuring that the projects submitted, assessed, scored, and listed in the SWRP using the online checklist comply with the applicable requirements of the following:

- Compliance with the California Environmental Quality Act,
- Consistency with applicable permits (e.g., National Pollutant Discharge Elimination System (NPDES) permits, waste discharge requirements, Areas of Special Biological Significance (ASBS) Compliance Plans),
- Consistency with California Health and Safety Code regarding pest and mosquito abatement,
- Consistency with the Clean Water Act sections 401 and 404 and any other federal or state laws, regulations, and permits regarding modification of a river or stream channel, and
- Project monitoring per the SWRP Guidelines.

As discussed in Chapter 4, this SWRP is consistent with water quality control plans, applicable water quality control policies, and water rights. Chapter 2 discusses the process for submission and incorporation of the SWRP into the IRWM Plan.

1.7 SWRP Sections, Checklist, and Certification

The SWRP chapters and corresponding sections of the SWRP Guidelines are as follows:

SWRP Chapter	SWRP Guideline Section
Chapter 1: Introduction	Section V
Chapter 2: Coordination and Outreach	Section VI.B and Section VI.F
Chapter 3: Watershed Identification	Section VI.A
Chapter 4: Water Quality Compliance	Section V
Chapter 5: Quantitative Methods and Identification of Prioritization of Projects	Section VI.C and Section VI.D
Chapter 6: Implementation Strategy and Schedule	Section VI.E
Chapter 7: Process for Plan Updates, Program Assessment and Adaptive Management	Section V1.E

Information on where specific elements of the SWRP Guidelines are presented in this document, or in plans that compose this functionally equivalent SWRP, is provided in the plan checklist in Appendix A. The Appendix A checklist lists each of the elements in the SWRP per the California Water Code and the sections of the applicable plan that address each element. The Appendix A checklist has been certified by the County of San Diego for the San Diego Copermittees, which means that the County of San Diego certifies that the SWRP is complete, accurate, and addresses the elements presented in the SWRP Guidelines.

CHAPTER 2
Coordination and Outreach (SWRP Guidelines Sections VI.B and VI.F)

SWRP Guidelines Checklist

Organization, Coordination and Collaboration

- ☒ Community participation.
- ☒ Existing integrated regional water management group(s) implementing an integrated regional water management plan.
- ☒ Coordination with agencies to address the storm water and dry weather runoff management objectives for the targeted watershed.
- ☒ Nonprofit organizations working on storm water and dry weather resource planning.
- ☒ Public engagement efforts and community participation.
- ☒ Required decisions that must be made by local, state or federal regulatory agencies and coordinated monitoring.
- ☒ Coordination of existing local governmental agencies to support collaboration among two or more lead local agencies.
- ☒ Individual agency participation in isolated efforts.

Education, Outreach, Public Participation

- ☒ Outreach and Scoping: Community participation is provided for in Plan implementation.
- ☒ Plan describes public education and public participation opportunities to engage the public when considering major technical and policy issues related to the development and implementation.
- ☒ Plan describes mechanisms, processes, and milestones that have been or will be used to facilitate public participation and communication during development and implementation of the Plan.
- ☒ Plan describes mechanisms to engage communities in project design and implementation, including disadvantaged communities.
- ☒ Plan identifies specific audiences including local ratepayers, developers, locally regulated commercial and industrial stakeholders, nonprofit organizations, and the general public.
- ☒ Plan includes a schedule for initial public engagement and education.

Development of the SWRP was a collaborative effort that featured early involvement of water management organizations and affected stakeholders, including regulatory agencies, local jurisdictions, utilities, academic institutions, non-governmental organizations (NGOs), special interest groups, and the interested public. Involving representatives from disadvantaged communities (DACs) and Native American tribes has been a priority.

The stakeholder education and participation and public outreach program for the SWRP followed a process similar to the San Diego IRWM Plan, which was developed as a result of a two-year process that involved direct input from many stakeholder groups and members of the public, including representatives from local agencies and NGOs. In addition, the development of the San Diego County Copermittees' WMA WQIPs, which provide a significant portion of the content of this SWRP, went through an extensive stakeholder outreach and involvement process. Therefore, the collaborative effort in the development and implementation of this SWRP includes stakeholder participation and public outreach programs developed and ongoing through the IRWM Plan and WQIPs.

2.1 Stakeholder and Public Participation

2.1.1 San Diego IRWM Plan Outreach and Participation

The collaborative stakeholder process that was used to develop the IRWM Plan is explained in detail in Chapter 6 of the IRWM Plan. The RWMG was formed in 2005 in accordance with provisions of the California Water Code (Section 79570 et seq.) to manage development and implementation of the IRWM Plan, and to manage the San Diego IRWM Program. The RWMG consists of the San Diego County Water Authority (SDCWA), the City of San Diego, and the County of San Diego. Chapter 1 of the IRWM Plan (page 1-7) provides an overview of the IRWM Program's RWMG. In addition, the stakeholder advisory body for the IRWM Region (the 34-member Regional Advisory Committee or RAC) is a collection of professionals who represent diverse groups and points of view with a stake in water management in the region, including economically vulnerable and environmental justice (EJ) communities, and climate-vulnerable communities. The RAC has met regularly since its inception and is responsible for providing input and feedback to the RWMG with regard to regional planning and funding activities. RAC meetings are open to all interested parties, including over 500 active stakeholders, and are announced via email. To ensure that DACs are notified and could participate in the public outreach meetings, additional follow-up emails and phone calls were made to known DAC stakeholders to alert them to the meeting date, time, and location. The list of participants was expanded to include the stakeholders that participated in the development of the WQIPs. Section 6.3 of the IRWM Plan provides a description of the governance structure, RAC, and various working groups that were developed to provide input on specific topics for the IRWM Plan. A comprehensive list of agencies and organizations that are involved in water management in the San Diego IRWM Region, including information about their level of involvement in the IRWM planning process is provided in Table 6-14 of the IRWM Plan.

During development of the IRWM Plan, the RWMG reached out directly to many organizations that are involved with addressing water-related issues of DACs and EJ communities within the IRWM region. During this process, it was determined that there are different types of issues and needs for different types of DACs and EJ communities. Specifically, it was determined that there is a general common set of issues for DACs and EJ communities within urban areas (that receive municipal water and sewer services), and a separate set of issues for DACs and EJ communities within rural areas that largely rely on groundwater wells for water supply and septic systems for wastewater disposal. The specific set of issues common to urban and rural DACs and EJ communities are provided in detail in Section 3.3 of the IRWM Plan.

Furthermore, Chapter 5 of the IRWM Plan provides details about each WMA in the region. For each watershed, there is a section titled "Management Issues and Conflicts" specific to the watershed, which includes information about DACs and EJ communities where applicable. These issues are taken into consideration when evaluating and selecting projects for funding through the IRWM Program.

2.1.2 WQIP Outreach and Participation

WQIPs were developed in accordance with a public participation and outreach process to solicit data, information, and recommendations from stakeholders. Stakeholder involvement is required under each WMA's MS4 permit, and was key in the development of the WQIPs. Each WQIP formed consultation panels consisting of representatives from the San Diego Regional Water Quality Control Board (SDRWQCB) and the environmental and development communities familiar with the water quality conditions in each WMA. Consultation panel meetings and public workshops were held during each phase of WQIP development. Public workshops provided a forum for public suggestions for water quality improvement priorities, likely sources, and potential strategies. Data provided consisted of observational data and email messages from members of the public, information from regional NGOs, and additional reports provided by the Responsible Agencies. The data included evidence of pollutants and stressors at several locations. This information was used to prioritize water quality issues and potential projects. Feedback received during this process was vital to the development of each plan. Each WQIP provides a description of the public participation process in detail, including participating panelists, feedback received, and revisions made. Development of a WQIP may vary slightly by WMA, but typically involves a six-step process, which is summarized below.

- Step (1) determines the highest priority water quality conditions in water bodies in the WMA (e.g., a creek or bay) on the basis of evidence showing that a water body is being polluted by runoff from the MS4.
- Step (2) identifies the sources of pollution for the highest priority water quality conditions.
- Step (3) formulates goals, strategies, and schedules to address the highest priority water quality conditions. The final three steps of the WQIP are designed to evaluate the progress made in addressing the priority and highest priority water quality conditions.
- Step (4) provides ongoing monitoring and assessment to evaluate the overall progress made in the WMA, including success in meeting the goals identified for the highest priority water quality conditions.
- Step (5) updates the WQIP as needed through an adaptive management process, which can entail adjustments to goals and strategies, as needed, to increase effectiveness.
- Step (6) reports on the findings of the assessments, along with any adjustments to the WQIP.

2.1.3 SWRP-Specific Outreach and Participation

A collaborative ad hoc committee for the SWRP, composed of the County of San Diego Public Works, SWRCB, the MS4 Copermittees, and environmental consultants Environmental Science Associates (ESA) and RMC Water and Environment, was established to discuss the SWRP development and to gain stakeholder input from a directed technical group. The committee met on a regular basis between August 2016 and January 2017 to discuss development and progress of the SWRP, prioritization criteria for assessing projects, public outreach efforts, and other related topics. The SWRP ad hoc members are listed in Table 2-1.

TABLE 2-1
SWRP AD HOC COMMITTEE MEMBERS

Name	Affiliation
Harish Bagha	SWRCB
Sean Maguire	SWRCB
Stephanie Gaines	County of San Diego, Department of Public Works
Ruth de la Rosa	County of San Diego, Department of Public Works
Doug Thomsen	City of San Diego
Rosanna Lacarra	La Roc Environmental representing City of Coronado
Chris Helmer	City of Imperial Beach
David Pohl	ESA
Lindsey Sheehan	ESA
Crystal Benham	RMC Water and Environment
Rosalyn Prickett	RMC Water and Environment

Stakeholder and public participation for the SWRP was facilitated through two co-hosted RAC meetings, the first of which was held on October 5, 2016, to present SWRP project eligibility for SWRCB storm water Proposition 1 grant funding. Evaluation criteria, as well as regional quantitative metrics and project prioritization tools at the watershed level, were also presented. Example projects were presented to show the quantification of benefits using the developed metrics and prioritization. In addition, the meeting provided stakeholders with the opportunity to present projects they would like to include in the SWRP following the application procedures for SWRCB storm water Proposition 1 funding (see Chapter 6 of this plan). The materials for the first workshop are included in Appendix C. Input from the attendees on the project criteria, metrics, and prioritization process was requested to be submitted within two weeks of the workshop. A summary of comments is provided in Appendix D.

The second co-hosted RAC meeting was held on December 7, 2016 to present the Draft SWRP for stakeholder and public input. Notices for the two meetings were sent via email to the IRWM stakeholder list, in addition to the stakeholder list from the development of the WQIPs. Meetings were also publicly announced on the IRWM and SDCWA websites. In addition, the workshop included a call for projects for the second round of Proposition 1 Storm Water Grant Program Implementation funding through SWRCB. The materials for the second workshop are included in Appendix C.

The public outreach meetings that were held for development of the SWRP are shown in Table 2-2. A list of stakeholders and RAC meeting invitees and the WQIP stakeholder lists are provided in Table 2-3, and a list of attendees for the two meetings is provided below in Table 2-4. The meeting notes from the two stakeholder workshop can be found in Appendix B.

TABLE 2-2
SWRP STAKEHOLDER MEETINGS

Date	Meeting
August 11, 2016	SWRP Ad hoc committee meeting
September 19, 2016	SWRP Ad hoc committee meeting
October 5, 2016	RAC meeting - project prioritization criteria, metrics and scoring
October 21. 2016	SWRP Ad hoc committee meeting
November 29, 2016	SWRP Ad hoc committee meeting
December 7, 2016	RAC meeting - Draft SWRP and call for Projects for Round 2 of the SWRCB storm water Proposition 1 funding

2.2 Methods of Outreach

Meetings and news updates were announced through both the San Diego IRWM website and through a targeted email distribution list. Presentations were given to agencies, organizations, and community groups, and outreach was completed for DACs and Native American tribes in the region to increase involvement and participation from stakeholders that represent these groups. For a complete description of the stakeholder involvement program, including directed outreach to DACs and Native American tribes, please refer to Section 6.4 of the IRWM Plan.

Moving forward, ongoing involvement in the SWRP process will largely occur through the project submittal and evaluation process. When storm water-related funding sources are available, announcements will be made via the IRWM stakeholder list so that all active stakeholders are aware of the funding opportunities. These announcements and ongoing communications that occur via the IRWM Program will be consistently tracked so that the County of San Diego can verify that stakeholders, including DACs, continue to be involved in the SWRP process.

The project checklist required for inclusion in the SWRP project list includes a question on whether the project sponsor has provided opportunities, mechanisms, and a schedule for public engagement in project approach, design, and implementation. The project checklist also includes a checklist item for summarizing this public engagement. Points are awarded for outreach efforts and continued stakeholder engagement, which provides a mechanism to encourage project proponents to include stakeholder outreach and engagement in their projects.

Moving forward, the San Diego IRWM Region's RWMG will continue to track issues and needs of DACs and EJ communities throughout the region. These issues and needs will generally be addressed via the implementation of priority projects that are identified through the SWRP, or other programs in the region.

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TABLE 2-3
LIST OF STAKEHOLDERS FOR SWRP

Federal and State Agencies	Co-permittees and Local Agencies		Tribes, Non-Profits and Other Organizations	
Bureau of Indian Affairs	Alpine Sanitation District	Mission Resource Conservation District	Agua Hedionda Lagoon Foundation**	Mission Trails Regional Park Foundation**
California Coastal Conservancy	American Water Company	Mootamai Municipal Water District	Association of Compost Producers	Pala Band of Luiseño Mission Indians
California Department of Fish and Wildlife	Buena Sanitation District	Oceanside Utilities Commission	Back Country Land Trust**	Pauma Band of Luiseño Mission Indians
California Department of Water Resources	Carlsbad Municipal Water District	Olivenhain Municipal Water District	Barona Group of Capitan Grande Band of Mission Indians	Planning and Engineering for Sustainability**
California Water Resources Control Board	City of Carlsbad	Otay Water District	Batiquitos Lagoon Foundation**	Preserve Calavera Project Wildlife**
International Boundary and Water Commission	City of Chula Vista	Orange County Public Works	Bonsall Conservancy**	Rincon Band of Luiseño Mission Indians
SDRWQCB	City of Coronado	Padre Dam Municipal Water District	Buena Vista Lagoon Foundation	River Partners**
U.S. Bureau of Land Management	City of Del Mar	Pauma Valley Community Services District	Building Industry Association of San Diego	Rose Creek Watershed Alliance**
U.S. Bureau of Reclamation	City of El Cajon	Pine Hills Mutual Water Company	California Center for Sustainable Energy**	Rural Community Assistance Corporation*
U.S. Fish and Wildlife Service	City of Encinitas	Pine Valley Mutual Water Company	California Coastal Coalition	San Carlos Area Council, Mission Trails Park
U.S. Forest Service, Cleveland National Forest	City of Escondido	Pine Valley Sanitation District	California Landscape Contractors Association	San Diego Audubon Society**
U.S. Geological Survey	City of Imperial Beach	Questhaven Municipal Water District	California Rural Water Association	San Diego CoastKeeper*
U.S. Marine Corps Camp Pendleton	City of La Mesa	Rainbow Municipal Water District	California Trout**	San Diego Country Estates
	City of Lemon Grove	Ramona Municipal Water District	Campo Band of Diegueno Mission Indians	San Diego Earthworks
	City of National City	Rancho California Water District	Cottonwood Creek Conservancy**	San Diego River Conservancy
	City of Oceanside	Rancho Pauma Mutual Water Company	Escondido Creek Conservancy**	San Diego River Park Foundation
	City of Poway	Rancho Santa Fe Community Services District	Environmental Health Coalition	San Diego Zoological Society
	City of San Diego	Rincon Del Diablo Municipal Water District	Equinox Center	San Dieguito River Valley Land Conservancy
	City of San Marcos	Rincon Ranch Community Services District	Fallbrook Land Conservancy	San Elijo Lagoon Conservancy**
	City of Santee	San Diego Association of Governments (SANDAG)	Floodplain Management Association	San Luis Rey Watershed Council
	City of Solana Beach	San Diego Chamber of Commerce	Friends of Santee's River Park	San Pasqual Band of Diegueno Mission Indians
	City of Vista	San Diego County Air Pollution Control District	Friends of Loma Alta Creek**	SDSU Center for Regional Sustainability
	County of San Diego	San Diego County Flood Control District	Friends of Mission Valley Preserve**	SDSU Department of Geography
	Cuyamaca Water District	San Diego County Water Authority	Friends of Rose Canyon**	Sierra Club**
	Descanso Community Services District	San Diego County Regional Airport Authority	Friends of Rose Creek**	Solana Center**
	East Otay Mesa Sewer MD	San Diego Gas and Electric	Groundwork San Diego-Chollas Creek*	Southern California Tribal Chairmen's Association
	Encina Wastewater Authority	San Diego Unified Port District	I Love A Clean San Diego	Southern California Wetlands Recovery Project**
	Fairbanks Ranch Community Services District	San Diego Regional Chamber of Commerce	Iipay Nation of Santa Ysabel	Surfrider Foundation San Diego**
	Fallbrook Public Utility District	San Dieguito Water District	Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation	Sycuan Band of the Kumeyaay Nation
	Farm Bureau of San Diego County	San Elijo Joint Powers Authority	Industrial Environmental Association	The Nature Conservancy**
	Greater San Diego County Resource Conservation District	Santa Fe Irrigation District	Iron Mountain Conservancy**	Tribal Reservation(s)
	Helix Water District	South Bay Irrigation District	Jacobs Center for Neighborhood Innovation	Trust for Public Land**
	Julian Community Services District	Spring Valley Sanitation District	Jamul Indian Village	UC Cooperative Extension – San Diego County Farm & Home
	Julian Sanitation District	Sweetwater Authority	Kumeyaay Diegueno Land Conservancy**	Universities (UCSD, SDSU, USD, etc.)
	Lakeside Water District	Vallecitos County Water District	La Jolla Band of Luiseño Indians	UCSD Clean Water Utility
	Lakeside Sanitation District	Valley Center Municipal Water District	La Posta Band of Diegueno Mission Indians	Upper San Luis Rey Resource Conservation District
	Leucadia Wastewater District	Valley Center Parks and Recreation District	Lakeside River Park Conservancy**	Viejas Group of Capitan Grande Band of Mission Indians
	Majestic Pines Community Services District	Vista Irrigation District	Los Coyotes Band of Cahuilla and Cupeno Indians	WildCoast**
	Morro Hills Community Services District	Whispering Palms Community Services District	Los Peñasquitos Lagoon Foundation**	Winter Gardens Sewer MD
	Metropolitan Water District of Southern California	Wynola Water District	Manzanita Band of Diegueno Mission Indians	Zoological Society of San Diego
		Yuima Municipal Water District	Mesa Grande Band of Diegueno Mission Indians	

* DAC representative
** Non-profit organization

TABLE 2-4
LIST OF RAC MEETING ATTENDEES FOR SWRP

October 5, 2016	December 7, 2016
RAC Members	RAC Members
Lan Wiborg, City of San Diego (chair)	George Adrian, City of San Diego (chair)
Amanda Loeper for Kimberly O'Connell, UC San Diego Clean Water	Alex Yescas for Mike Seits, Floodplain Management Association
Ann Van Leer, Escondido Creek Conservancy	Ann Van Leer, Escondido Creek Conservancy
Arne Sandvik for Albert Lau, Padre Dam	Bob Kennedy, Otay Water District
Bill Hunter, Santa Fe Irrigation District	Brian Olney, Helix Water District
Bob Kennedy, Otay Water District	Chris Helmer, City of Imperial Beach
Brian Olney, Helix Water District	Crystal Najera, City of Encinitas
Chris Helmer, City of Imperial Beach	Greg Thomas, Rincon del Diablo Municipal Water District
Chris Roesink for Patrick Crais, California Landscape Contractors Association	Jennifer Hazard for Olga Morales, RCAC
Crystal Najera, City of Encinitas (and alternate Ligeia Heagy, Carlsbad Municipal Water District)	Jennifer Sabine, Sweetwater Authority
Greg Thomas, Rincon del Diablo Municipal Water District	Jona Lee for Jack Simes, U.S. Bureau of Reclamation
Jack Simes, U.S. Bureau of Reclamation	Joey Randall for Kimberly Thorner, Olivenhain Municipal Water District
Jennifer Hazard, Alter Terra	John Flores, San Pasqual Band of Mission Indians (and alternate Rob Roy, La Jolla Band of Indians)
Joey Randall for Kimberly Thorner, Olivenhain Municipal Water District	Kelly Craig for Robyn Badger, Zoological Society of San Diego
John Flores, San Pasqual Band of Mission Indians (and alternate Rob Roy, La Jolla Band of Indians)	Kimberly O'Connell, University of California – San Diego Clean Water
Kristin Kuhn for Travis Pritchard, San Diego Coastkeeper	Leigh Johnson, University of California Cooperative Extension Michael McSweeney (and alternate S. Wayne Rosenbaum), Building Industry Association
Lauma Willis, Department of Water Resources – Southern Region Office	Mike Thornton, SEJPA
Leigh Johnson, University of California Cooperative Extension	Oscar Romo for Jennifer Hazard, University of California – San Diego
Mark Stadler for Toby Roy, San Diego County Water Authority	Patrick Crais, California Landscape Contractors Association
Marilyn Thoms, County of Orange	Phil Pryde, San Diego River Park Foundation
Michael McSweeney, Building Industry Association	Ronald Wootton, Buena Vista Lagoon Foundation
Mike Thornton, SEJPA	Sarah Pierce, San Diego Association of Governments
Pablo Figueroa for Olga Morales, RCAC	Stephanie Gaines for Ramin Abidi, County of San Diego
Phil Pryde, San Diego River Park Foundation	Toby Roy (and alternate Mark Stadler), San Diego County Water Authority
Ramin Abidi, County of San Diego	Travis Pritchard, San Diego Coastkeeper
Sarah Pierce, San Diego Association of Governments	
RWMG Staff and Consultants	RWMG Staff and Consultants
Andrew Funk, City of San Diego	Andrew Funk, City of San Diego
Crystal Benham, RMC Water and Environment	Goldy Herbon, San Diego County Water Authority
Goldy Herbon, City of San Diego	Jen Sajor, RMC Water and Environment
Loisa Burton, San Diego County Water Authority	Loisa Burton, San Diego County Water Authority
Mark Stephens, City of San Diego	Mark Stephens, City of San Diego
Rosalyn Prickett, RMC Water and Environment	Rosalyn Prickett, RMC Water and Environment
Sally Johnson, RMC Water and Environment	Ruth Kolb, City of San Diego
Stephanie Gaines, County of San Diego	Sally Johnson, RMC Water and Environment
Interested Parties to the RAC	Interested Parties to the RAC
Alex Heide, City of Poway	David Pohl, ESA
Amanda Sousa, San Diego Housing Commission	Michelle Berens, Helix Water District
Antonia Estevez-Olea, LWA	Antonia Estevez-Olea, Larry Walker Associates
Bryn Evans, Dudek	Boushra Salem, City of Chula Vista
Boushra Salem, City of Chula Vista	Maria Margarita Borja, City of San Diego
Chiara Clemente, Regional Water Quality Control Board - Region 9	Hengameh Maher, City of San Diego
David Pohl, ESA	Dawnn Jackson, City of San Diego
Doug Thomsen, City of San Diego	Michelle Huynh, City of San Diego
George Wilkins, San Luis Rey Watershed Council and La Jolla Tribe	Roshan Christoph, Amec Foster Wheeler
Heidi Brow, Pala Tribe	Roberto Yano, JPA/SD Metro
Helen Davies, City of Escondido	Tony Hancock, Brown & Caldwell
Jana Vierola, San Diego County Water Authority	Martha Davis, City of San Diego
Janice Duvall, San Diego County Office of Education	Malik Tamimi, City of La Mesa
Lisa Skutecki, Brown and Caldwell	Cat Rom, City of San Diego
Maria Margarita Borja, City of San Diego	Jennifer Carroll, City of San Diego
Marsha Westropp, Orange County Water District	Lindsey Sheehan, ESA
Martha Davis, City of San Diego	Ruth de la Rosa, County of San Diego
Mo Lahsaie, City of Oceanside	Amanda Sousa, San Diego Housing Commission
Nathan White, City of San Diego	Matt Widelski, City of Encinitas
Ray Teran, Viejas Band of Kumeyaay Indians	Anne Bamford, IEA
Ruth de la Rosa, County of San Diego	Lois Yum, City of San Diego
	Kyrsten Rosenthal, City of San Diego

2.3 Storm Water and Dry Weather Runoff Management Objectives

Storm water and dry weather runoff management objectives were addressed through stakeholder involvement for each WMA Copermittee WQIP process. The WQIPs specifically address the issue of storm water and dry weather runoff management objectives as they relate to water quality, pollutant load reduction, and elimination of non-storm-water flows from the MS4 permits (these objectives are discussed in Section 5.3). The WQIPs were required to address storm water and dry weather flow management. Therefore, the groups and stakeholders involved in the development of the WQIPs are part of the coordination for the SWRP development and implementation. Stakeholders included those defined by Phase I and Phase II programs of the MS4 program. Phase I stakeholders include Copermittees, whereas Phase II stakeholders typically include public institutions, military bases, public campuses, prison and hospital complexes, etc. Phase I stakeholders that participated in each Copermittee WMA WQIP are included in Table 2-5 below. Examples of WQIP Phase II stakeholders include but are not limited to: San Diego County Fairgrounds, University of California, Veterans Administration San Diego Healthcare System, North County Transit District, and Marine Corps Air Station Miramar.

TABLE 2-5
STAKEHOLDERS INVOLVED IN WQIP PROCESS

Watershed Management Area	Stakeholders/Participating Agencies
Santa Margarita River	City of Menifee City of Murrieta City of Temecula City of Wildomar County of San Diego Riverside County Flood Control and Water Conservation District
San Luis Rey River	California Department of Transportation (Caltrans) City of Oceanside City of Vista County of San Diego
Carlsbad	City of Carlsbad City of Encinitas City of Escondido City of Oceanside City of San Marcos City of Solana Beach City of Vista County of San Diego
San Dieguito River	City of Del Mar City of Escondido City of Poway City of San Diego City of Solana Beach County of San Diego

Watershed Management Area	Stakeholders/Participating Agencies
Los Peñasquitos	Caltrans City of Del Mar City of Poway City of San Diego County of San Diego
Mission Bay	Caltrans City of San Diego
San Diego River	Caltrans City of El Cajon City of La Mesa City of San Diego City of Santee County of San Diego
San Diego Bay	Caltrans City of Chula Vista City of Coronado City of Imperial Beach City of La Mesa City of Lemon Grove City of National City City of San Diego County of San Diego San Diego County Regional Airport Authority San Diego Unified Port District (Port of San Diego)
Tijuana River	City of Imperial Beach City of San Diego County of San Diego

2.4 Required Decisions That Must Be Made By Local, State, or Federal Regulatory Agencies for Plan Implementation

2.4.1 SWRP Development, Implementation, and Updates

At the local level, the SWRP ad hoc working group is responsible for leading the development of the SWRP and continued adaptive management of the SWRP. The SWRP ad hoc working group reviewed and commented on the draft versions of the SWRP and confirmed that comments and input from the stakeholder workshops were addressed as applicable. The Draft SWRP was made available to the Copermittees for review and input prior to plan finalization. The overall development of the SWRP was a coordinated effort of the Copermittees that was led by the SWRP ad hoc working group. The implementation of the SWRP that includes coordinating the submission of projects as part of the IRWM OPTI web-site will be coordinated through the IRWM program.

2.4.2 SWRP Adoption

As the Lead Agency for the development of the SWRP on behalf of the Copermittees, the County of San Diego will adopt the plan. It is recommended that each watershed jurisdiction adopt the SWRP as well, but it is not required.

Chapter 6 of the IRWM Plan describes how the IRWM Program's governance structure has evolved over time to best implement IRWM Plan recommendations. Coordination between local governmental agencies is a pillar of the IRWM planning process. Significant updates or amendments to the IRWM Plan (including adoption of the SWRP by the San Diego Region's RWMG), will potentially require the agencies that comprise the RWMG to re-adopt the IRWM Plan. Therefore, upon conclusion of the SWRP and after information from the SWRP is incorporated into the San Diego IRWM Plan during a 2017 update, the RWMG agencies will re-adopt the IRWM Plan.

2.4.3 Regional MS4 Permit Compliance

The SDRWQCB regulates discharges from Phase I MS4s in the San Diego Region under the Regional MS4 Permit. The Regional MS4 Permit covers 38 municipal, county government, and special district entities (referred to jointly as Copermittees) located in San Diego County, southern Orange County, and southwestern Riverside County who own and operate large MS4s that discharge storm water (wet weather) runoff and non-storm water (dry weather) runoff to surface waters throughout the San Diego Region. Each Copermittee has a memorandum of understanding with cooperating agencies within the region to ensure collaboration of WQIP implementation.

2.4.4 Project Monitoring and Reporting

The monitoring and visualization requirements under the SWRP will be implemented and reported based on the individual project metrics and monitoring plan. The project applicant will be responsible for ensuring that monitoring is being conducted and reported in accordance with the grant agreement so that the project's metrics for success are met. The monitoring and reporting will depend on the type of project and grant requirements, which vary between programs. For those projects that are funded through the SWRCB Prop 1 Storm Water Grant Program and DWR's IRWM Grant Program, regional projects may be overseen through a regional monitoring program under existing cooperative agreements. Applicants will be responsible for uploading to the designated state database the data generated to address the monitoring and visualization requirements.

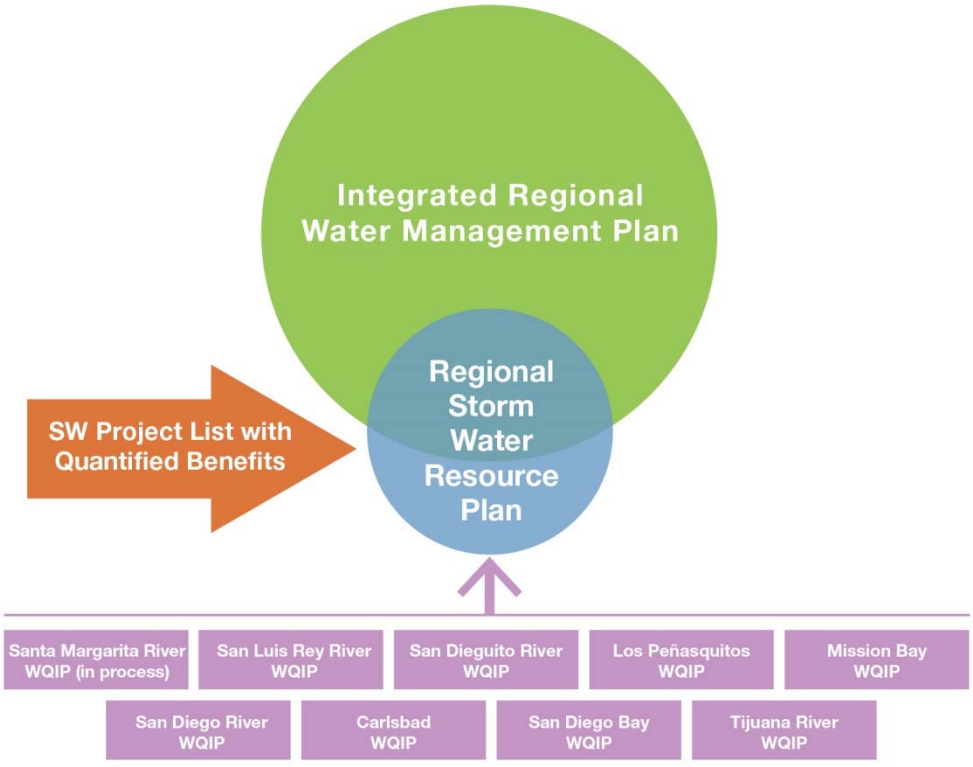
2.5 Relationship to Other Plans

As described in Chapter 1, this SWRP is consistent with regional and local water plans, such as the WQIPs for each watershed in the region, and the IRWM Plan.

The goal of the WQIPs is to further the Clean Water Act's objective to protect, preserve, enhance, and restore water quality and beneficial uses. By prioritizing and addressing water quality

conditions that are influenced by storm drain discharges, the participating agencies and stakeholders for each watershed are able to utilize key resources to address the most important issues.

The San Diego IRWM Program is an "umbrella" planning process that consolidates and synthesizes information from existing processes throughout the IRWM Region. The IRWM Plan is consistent with other regional and local plans developed by Metropolitan Water District of Southern California, the SDCWA, and local agencies, and incorporates goals and elements of these individual plans. Chapter 10 of the IRWM Plan provides detailed information about the planning documents that were used as the basis of information within the IRWM Plan. The SWRP brings together regional planning on storm water management, and will be incorporated into the IRWM Plan to fulfill this need. SWRP projects with information in the OPTI online system are included in IRWM planning by virtue of being in the online database. The San Diego IRWM Plan will be amended in 2017 to include additional information about the SWRP and coordination between the SWRP and IRWM activities, and will also address new requirements from DWR that were issued in 2016.



SWRP . 160618

NOTE: SW = Storm water

Figure 2-1
SWRP Relationship to Other Plans

SWRP Checklist Guidelines

- ☒ Plan identifies watershed and subwatershed(s) for storm water resource planning
- ☒ Plan is developed on a watershed basis, using boundaries as delineated by USGS, CalWater, USGS Hydrologic Unit designations, or an applicable integrated regional water management group, and includes a description and boundary map of each watershed and sub-watershed.
- ☒ Plan includes an explanation of why the watershed(s) and sub-watershed(s) are appropriate for storm water management with a multiple-benefit watershed approach.
- ☒ Plan describes the internal boundaries within the watershed (boundaries of municipalities; service areas of individual water, wastewater, and land use agencies, including those not involved in the Plan; groundwater basin boundaries, etc.; preferably provided in a geographic information system shape file).
- ☒ Plan describes the water quality priorities within the watershed based on, at a minimum, applicable TMDLs and consideration of water body-pollutant combinations listed on the State's Clean Water Act Section 303(d) list of water quality limited segments (a.k.a impaired waters list).
- ☒ Plan describes the general quality and identification of surface and ground water resources within the watershed (preferably provided in a geographic information system shape file).
- ☒ Plan describes the local entity or entities that provide potable water supplies and the estimated volume of potable water provided by the water suppliers.
- ☒ Plan includes map(s) showing location of native habitats, creeks, lakes, rivers, parks, and other natural or open space within the sub-watershed boundaries.
- ☒ Plan identifies (quantitative, if possible) the natural watershed processes that occur within the sub-watershed and a description of how those processes have been disrupted.

CHAPTER 3
Watershed Identification
(SWRP Guidelines Section VI.A)

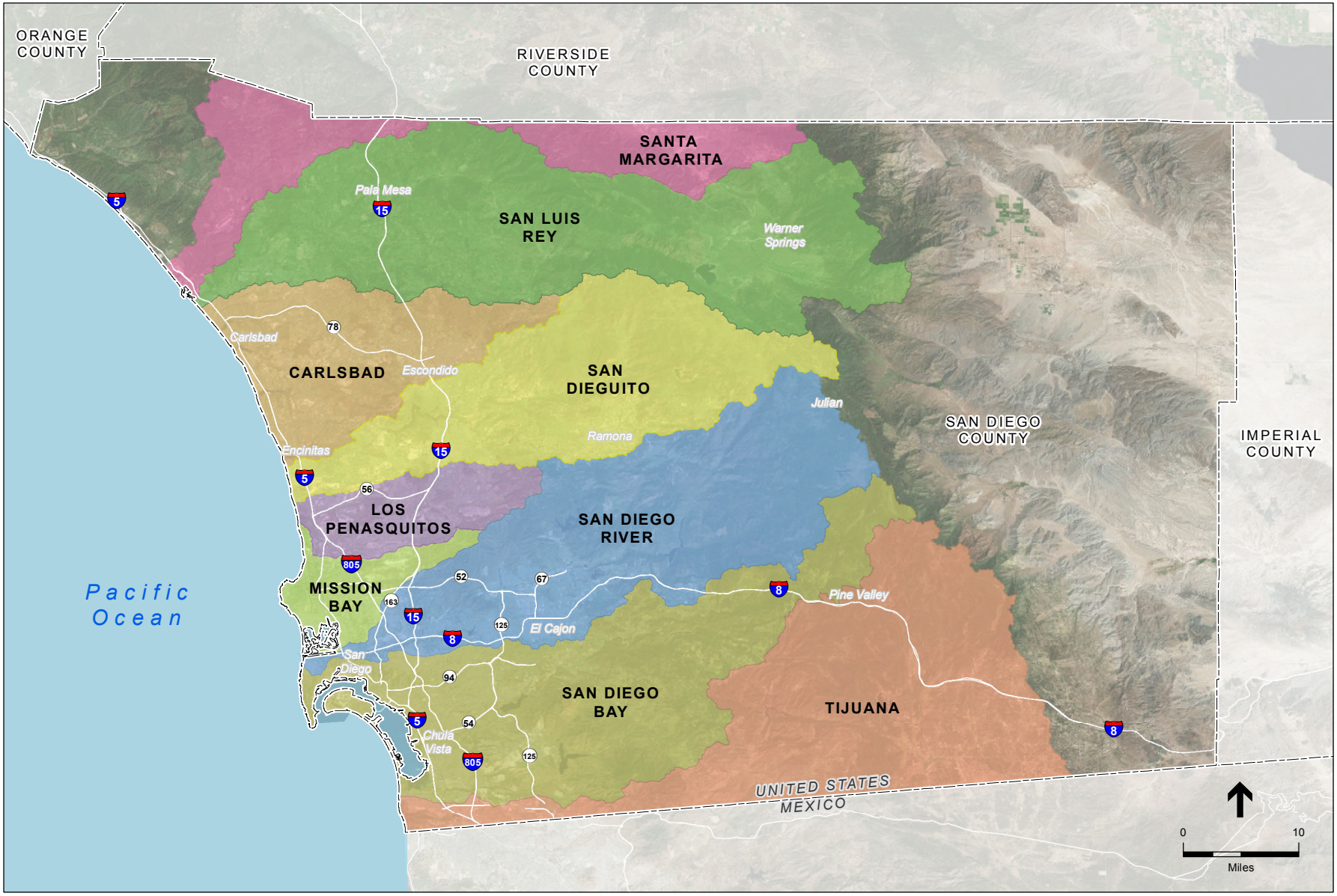
The SWRP addresses nine WMAs within San Diego County (Figure 3-1). The WMAs are defined by the Municipal Storm Water Permit Order 2001-01. Table 3-1 shows the HUs and hydrologic areas (HAs) that comprise each watershed management area. The San Juan WMA was not included in this document since the portion of the watershed in San Diego County is within federal jurisdiction at Camp Pendleton.

As described in Chapter 3.2 of the IRWM Plan, the WMAs are appropriate for watershed management because they take into account RWQCB jurisdictions, political jurisdictions, physical and hydrologic characteristics, the imported water supply service area, and wastewater service considerations. Each of the watershed management areas flows from higher elevations in the east, to coastal waters (e.g., lagoons, estuaries, bays) in the west. They all see seasonal surface flow from rain events in the winter and spring months, and are much drier in the summer, with irrigation and urban and agricultural runoff dominating the surface flows.

This section provides the current WMA conditions and priorities based on the current WQIPs as background to the rest of this document. As water quality conditions and priorities may change in the future, including updates to the State 303(d) list, the WQIPs will be updated in accordance with the MS4 Permit. As future listing in the SWRP requires identification of a project's prioritization in the most current WQIP for project with water quality benefits, updates to priority water quality conditions and goals will be reflected in SWRP listed projects.

TABLE 3-1
WATERSHED MANAGEMENT AREAS

Hydrologic Unit	Hydrologic Areas	Watershed Management Area
Santa Margarita (902.00)	Ysidora (902.10) De Luz (902.20) Pechanga (902.50) Aguanga (902.80) Oakgrove (902.90)	Santa Margarita River
San Luis Rey (903.00)	Lower San Luis Rey (903.10) Monserate (903.20) Warner Valley (903.30)	San Luis Rey River
Carlsbad (904.00)	Loma Alta (904.10) Buena Vista Creek (904.20) Agua Hedionda (904.30) Encinas (904.40) San Marcos (904.50) Escondido Creek (904.60)	Carlsbad
San Dieguito (905.00)	Solana Beach (905.10) Hodges (905.20) San Pasqual (905.30) Santa Maria Valley (905.40) Santa Ysabel (905.50)	San Dieguito River
Peñasquitos (906.00)	Miramar Reservoir (906.10) Poway (906.20) Scripps (906.30)	Los Peñasquitos
Peñasquitos (906.00)	Miramar (906.40) Tecolote (906.50) Vacation Isle (906.60) Fiesta Island (906.70) Mission Bay (906.80)	Mission Bay
San Diego (907.00)	Lower San Diego (907.10) San Vicente (907.20) El Capitan (907.30) Boulder Creek (907.40)	San Diego River
Pueblo San Diego (908.00)	Point Loma (908.10) San Diego Mesa (908.20) National City (908.30)	San Diego Bay
Sweetwater (909.00)	Lower Sweetwater (909.10) Middle Sweetwater (909.20) Upper Sweetwater (909.30)	
Otay (910.00)	Coronado (910.10) Otay (910.20) Dulzura (910.30)	
Tijuana (911.00)	Tijuana Valley (911.10) Potrero (911.20) Barrett Lake (911.30) Monument (911.40) Morena (911.50) Cottonwood (911.60) Cameron (911.70) Campo (911.80)	Tijuana River



SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-1

San Diego County Watershed Management Areas

3.1 Santa Margarita River

3.1.1 Santa Margarita River Watershed Management Area Description

The Santa Margarita River WMA (HU 902.00) is the largest WMA assessed in the SWRP[1], encompassing 494,396 acres, with approximately 75 percent of the watershed lying in Riverside County and the remaining 25 percent in the northern portion of San Diego County. The County of San Diego is the sole San Diego Region Copermittee with land jurisdiction in the Santa Margarita River WMA (Figure 3-2).

The WMA extends from the Palomar Range in the northeast, to the Santa Margarita Lagoon along the coast, and consists of nine HAs, five of which are in San Diego County: Ysidora (902.10), De Luz (902.20), Pechanga (902.50), Aguanga (902.80), and Oak Grove (902.90). These HAs are also broken down into 33 hydrologic subareas (HSAs), 15 of which are in San Diego County. The HUs and HAs for the Santa Margarita River WMA are shown in a map provided in Figure 3-3. This SWRP covers only the portion of Santa Margarita River WMA that is within San Diego County and not the portions that extend into Riverside County.

The Santa Margarita River WMA consists of a single major drainage, the Santa Margarita River, which is fed by several smaller tributaries, including De Luz, Sandia, and Rainbow Creeks in San Diego County (Figure 3-4).

3.1.2 Land Use

Land use within the full Santa Margarita River WMA (both San Diego and Riverside Counties) is classified primarily as undeveloped (61 percent). Other land use classifications include residential (10 percent), agriculture (9 percent), military (8 percent), and open space/parks and recreation (7 percent). Commercial, industrial, public facility, transportation, under construction, and water land uses each make up less than 2 percent of the remaining land use acreage (Weston, 2012).

Figure 3-5 shows the division of land by agency, including the Camp Pendleton Marine Corps Base and Falbrook Naval Weapons Station, which occupy approximately 8 percent of the watershed area in the southwestern portion of the watershed. Two tribal nations live within the WMA as well: the Pechanga Reservation and the Pauma and Yuima Reservation. Additionally, portions of the WMA are managed as the Cleveland National Forest and by the Bureau of Land Management (BLM).

[1] The Tijuana WMA is the largest of the WMAs included in the SWRP, at 1.1 million acres. However, only the portion of the Tijuana WMA falling within the United States, in San Diego County, were included in the SWRP (299,263 acres).

3.1.3 Water Quality

3.1.3.1 Applicable TMDLs and Special Biological Habitats

Santa Margarita River WMA TMDLs

TMDLs identify the total pollutant loading that a receiving water can accept and still meet water quality standards. The RWQCB is required to develop TMDLs or follow an alternative regulatory process to address 303(d) listed impairments. Since the 2006 SWRCB Section 303(d) list was published, several pollutants/stressors to the Santa Margarita River WMA water bodies have been delisted. These include Sandia Creek (manganese and nitrogen), Temecula Creek (nitrogen), and Long Canyon Creek (total dissolved solids (TDS)).

On February 9, 2005, the SDRWQCB adopted Resolution No. R9-2005-0036, an Amendment to the Water Quality Control Plan for the San Diego Basin to Incorporate TMDLs for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed. The TMDLs for total nitrogen and total phosphorus discharges into Rainbow Creek were calculated to be 1,658 and 165 kilograms per year, respectively. Attainment of these targets requires a 74 percent reduction in total nitrogen loading and an 85 percent reduction in total phosphorus loading from the watershed. The TMDL was approved by the SWRCB in November 2005 and by the United States Environmental Protection Agency (USEPA) on March 22, 2006, and it became effective under State law on February 1, 2006, the date of Office of Administrative Law approval (Weston, 2012).

The Santa Margarita Lagoon was studied in response to Investigation Order R9-2006-076. The TMDL for this lagoon is scheduled to be completed by January of 2019. Additionally, this lagoon was assessed as part of Bight ’08 Regional Study using the sediment quality objective assessment. A nutrient management plan is under development for the Lagoon.

TABLE 3-2
TMDLS IN THE SANTA MARGARITA RIVER WMA

Sub Watershed	Water Body Name	Pollutant	Adoption Date
Santa Margarita HU	Rainbow Creek	Nitrogen and Phosphorus	February 9, 2005
Santa Margarita HU	Santa Margarita Lagoon	Nutrients/Eutrophication	In Progress

3.1.3.2 Priority Water Quality Conditions

The WQIP for the Santa Margarita River WMA is currently under development. Priority and high priority water quality conditions for this WMA have not yet been identified through the WQIP process. Potential environmental water quality issues in the Santa Margarita River WMA include surface water and groundwater quality degradation, habitat loss, invasive species, and channel bed erosion (San Diego County, 2009). The 2010 SWRCB Section 303(d) list was adopted by the SWRCB on August 4, 2010, and was finalized by the USEPA on October 11, 2011. The several step process for identifying priority and high priority water quality conditions include review of the SWRCB Section 303(d) listings and the TMDLs approved or planned for impaired segments of the receiving waters (Section 3.1.3.1).

The upper portion of the watershed in Riverside County has been under continuous development, and pollutants/stressors within the watershed include eutrophic conditions, nutrients, pathogens, salinity, pesticides, metals/metalloids, toxicity, and other inorganics. Potential sources of these contaminants include urban runoff/storm sewers, agriculture/nurseries, septic tanks, natural sources, flow regulation/modification, and unknown point and nonpoint sources (SWRCB, 2010).

In addition to SWRCB Section 303(d) listings and TMDLs (Section 3.1.3.1), the results of the Copermittees annual water quality monitoring program and the 2011 Long Term Effectiveness Assessment (LTEA) (Weston, 2011) are also used in the development of the priority and high priority water quality conditions. These results include linkages between MS4 outfall water quality and potential contributions to recovering water quality. The results of annual monitoring and the LTEA have indicated the following linkages and water quality priorities for dry weather and wet weather water conditions:

- Dry Weather Flows
  - Nutrients, indicator bacteria, TDS, sulfate, and pH were identified as medium and high-priority constituents in dry weather MS4 flows.
  - Within the annual monitoring program monitored drainage area, nutrients (nitrate as N, nitrate/nitrite as N, total nitrogen, and total phosphorus) and TDS were identified as high priorities and indicator bacteria (fecal coliform and Enterococcus) was identified as a medium priority constituent in two MS4 outfalls during dry weather.
  - These results are consistent with historical data.
- Wet Weather Flows
  - The indicator bacteria fecal coliform, TDS, and TSS were identified as medium or high-priority constituents in wet weather MS4 flows.
  - Within the annual monitoring program monitored drainage area, fecal coliform and TDS were identified as high priority constituents in one MS4 outfall during wet weather.
  - These results are consistent with historical data.

These results with the Section 303(d) listing and TMDLs will be used to develop priority and high priority water quality conditions in the WQIP. Until the WQIP is finalized, the above water quality priorities may be used to identify and prioritize water quality opportunities in the Santa Margarita River WMA.

3.1.4 Water Resources and Systems

The San Diego County portion of the Santa Margarita River WMA lies within the jurisdiction of the SDCWA, which in 2015, provided the following imported water supplies to its member agencies located in the watershed: 8,000 acre-feet (AF) to Camp Pendleton U.S. Marine Corps (USMC) Base, 26,400 AF to the City of Oceanside, 12,300 AF to Fallbrook Public Utilities District (PUD), and 20,200 AF to Rainbow Municipal Water District (MWD) (SDCWA, 2015). Those agencies also function as wastewater agencies within the watershed (Figure 3-6). In

addition, localized groundwater pumping and surface water diversions from the Santa Margarita River provide water supplies to Camp Pendleton and the unincorporated community of De Luz). The City of Oceanside treats up to 25 million gallons per day (MGD) of water received from the SDCWA and up 6 MGD of local brackish groundwater from the Mission Basin (City of Oceanside, 2017). The Rainbow MWD produces approximately 20,000 AF of water to serve its customers each year (Rainbow MWD, 2017).

Groundwater supplies are sourced from the Santa Margarita Valley Groundwater Basin (Figure 3-4) ((DWR, 2004m). Well yields in the basin range from 200 to 1,980 gallons per minute (gpm). Natural recharge of the alluvial aquifer is primarily from percolation in the Santa Margarita River, with smaller amounts contributed by infiltration of precipitation falling to the valley floor. The total storage capacity of the basin is estimated to be 61,600 AF. Groundwater in this basin is mainly sodium chloride in character, but sodium bicarbonate is also present. TDS concentrations ranged from 337 to 9,030 milligrams per liter (mg/L) in 1956. Groundwater in the northwestern part of the basin is largely suitable for domestic and irrigation uses (DWR, 2004m). Groundwater in the southwestern part of the basin is marginal to inferior for domestic and irrigation uses. Magnesium, sulfate, chloride, nitrate, and TDS concentrations are locally high for domestic use; whereas, chloride, boron, and TDS concentrations are locally high for irrigation use (DWR, 2004m). The Pauma Reservation uses groundwater wells on reservation lands (Rancho California Water District (RCWD), 2007).

3.1.5 Natural Resources

Figure 3-7 shows the parks and open space within the portion of the Santa Margarita River WMA located in San Diego County, including the Santa Margarita Preserve.

The Santa Margarita River is the longest free flowing, un-dammed river in Southern California and has largely escaped the development common to the region. It supports the largest populations of seven federally or state-listed endangered species (County of San Diego, 2008). Habitats within the Santa Margarita River WMA include chaparral, riparian woodlands, coastal marshes, oak woodlands, and montane habitats. The portion of the Santa Margarita River WMA located in San Diego County provides critical habitat for 8 species, including Thread-Leaved brodiaea, Least Bell's vireo, San Diego fairy shrimp, Spreading navarretia, Arroyo Southwestern toad, Laguna Mountains skipper, and the Southwestern willow flycatcher, and the Western Snowy plover (Figure 3-7).

3.1.6 Watershed Processes

Despite its comparatively good condition, the Santa Margarita River WMA has been impacted by historic and current agricultural uses, as well as residential, commercial, and industrial development. The 2008 Santa Margarita Watershed Urban Runoff Management Plan (WURMP) (San Diego County, 2008a) focuses on reducing urban runoff and water quality concerns associated with urban runoff. Additionally, the WURMP (San Diego County, 2008a) noted that upstream channelization and other flood management efforts can lead to increased sedimentation downstream following a storm event. Since the Santa Margarita watershed spans two counties, cross-jurisdictional management is key to maintaining the existing quality of the watershed.

3.2 San Luis Rey River

3.2.1 San Luis Rey Watershed Management Area Description

The San Luis Rey River WMA (HU 903.00) encompasses 358,927 acres. Most of the WMA consists of County lands, with portions of Oceanside, and Vista, near the coast (Figure 3-8). The watershed extends from the Palomar and Hot Springs Mountains, as well as several other mountain ranges along the Anza Borrego Desert Park, to the Pacific Ocean in Oceanside. The San Luis Rey River WMA consists of three HAs: Lower San Luis Rey (903.10), Monserate (903.20), and Warner Valley (903.30) (Figure 3-9). These HAs are comprised of 11 HSAs.

The San Luis Rey River WMA consists of a single major drainage, the San Luis Rey River, which is fed by many smaller tributaries (Figure 3-10).

3.2.2 Land Use

Land use within the San Luis Rey River WMA is classified primarily as undeveloped (53 percent). Other land use classifications include residential (16 percent), agriculture (14 percent), parks (9 percent), military (3 percent), and transportation (2 percent). Commercial recreation, commercial, industrial, public facility, and water land uses each make up 1 percent or less of the land use acreage (Weston, 2012).

Figure 3-11 shows the division of land by agency, including a portion of the Camp Pendleton Marine Corps Base. Multiple tribal nations live within the WMA as well, including the Pauma and Yuima, Pala, Rincon, San Pasqual, La Jolla, Los Coyotes, and Santa Ysabel. Additionally, portions of the WMA are managed as the Cleveland National Forest and by the BLM, including BLM Lands and National BLM conservation areas.

3.2.3 Water Quality

3.2.3.1 Applicable TMDLs and Special Biological Habitats

San Luis Rey River WMA TMDLs

There is one TMDL for bacteria that has been adopted regionally and applies to receiving waters within the San Luis Rey River WMA—the Revised TMDL for Indicator Bacteria, Project 1—Twenty Beaches and Creeks in the San Diego Region. The receiving waters covered by the Bacteria TMDL are summarized in Table 3-3. There are no other TMDLs affecting the watershed that are currently in development by SWRCB.

TABLE 3-3
TMDLS IN THE SAN LUIS REY RIVER WMA

Sub Watershed	Water Body Name	Pollutant	Adoption Date
Lower San Luis HA	Pacific Ocean Shoreline at San Luis Rey River mouth	• Total Coliform • Fecal Coliform • Enterococcus	February 10, 2010

SOURCE: Larry Walker Associates (LWA), 2016a

Special Biological Habitats

Biological habitats of special significance are areas designated with the biological habitats of special significance beneficial use (BIOL). In the San Luis Rey River WMA, the following water bodies and areas are of special significance and can be classified as impaired for BIOL beneficial use:

- Pilgrim Creek
- San Luis Rey River
- Plaisted Creek

3.2.3.2 Priority Water Quality Conditions

The San Luis Rey River WMA WQIP (LWA, 2016a) provides a detailed description of the process for determining the Priority Water Quality Conditions for this WMA. The WQIP identified receiving water conditions and impacts from MS4 discharges to assess and develop a list of priority water quality conditions. An initial list of priority water quality conditions was developed and then compared with the public input that was provided during the October 7, 2013 workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-4.

TABLE 3-4
PRIORITY WATER QUALITY CONDITIONS IN THE SAN LUIS REY RIVER WMA

Condition	Dry Weather	Wet Weather
Priority Water Quality Conditions	• Nitrogen and Phosphorus • Eutrophic Conditions • Total Dissolved Solids • Index of Biotic Integrity • Chloride • Toxicity	• Nitrogen and Phosphorus • Total Dissolved Solids • Toxicity

SOURCE: LWA, 2016a

3.2.3.3 Highest Priority Water Quality Conditions

The San Luis Rey River WMA WQIP (LWA, 2016a) provides the details of the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-4. The MS4 Permit provides the Copermittees with the discretion to justify the highest priority water quality conditions for program development and implementation on the basis of a number of factors, including the potential to improve watershed health, available resources, and best professional judgment.

According to the methodology, the highest priority water quality conditions are priority water quality conditions that either (1) are associated with a TMDL, Areas of Special Biological Significance (ASBS) requirements, or other water quality regulations, or (2) have been elevated to highest priority on the basis of an evaluation of additional selection criteria. Based on this assessment, the WQIP (LWA, 2016a) identified the impairment (by bacteria) of water contact recreation beneficial use (REC-1) at the Pacific Ocean Shoreline, at the San Luis Rey River mouth and also in the Lower San Luis Rey River (west of Interstate-15) as the highest priority water quality conditions (Table 3-5).

TABLE 3-5
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE SAN LUIS REY RIVER WMA

Condition	Dry Weather	Wet Weather
Highest Priority Water Quality Conditions	• Bacteria at San Luis Rey River mouth • Bacteria in lower San Luis Rey River	• Bacteria at San Luis Rey River mouth • Bacteria in lower San Luis Rey River

SOURCE: LWA, 2016a

Priority water quality conditions not associated with regulatory drivers were further considered for elevation to a highest priority on the basis of four additional factors:

(1) The supporting data set is sufficient to adequately characterize the degree to which the priority water quality condition changes seasonally, and over the geographic area, to support its consideration as a highest priority water quality condition.

(2) Storm water/non-storm-water runoff is a predominant source for the priority water quality condition.

(3) The priority water quality condition is controllable by the Responsible Agencies.

(4) The priority water quality condition would not be addressed by strategies identified for other highest priority water quality conditions in the WQIP.

This analysis is presented in the San Luis Rey River WMA WQIP (LWA, 2016a) and determined that most of the priority water quality conditions will be addressed by strategies applicable to the highest priority water quality conditions, which justifies not elevating these conditions to highest priority.

3.2.4 Water Resources and Systems

The San Luis Rey River WMA lies within the jurisdiction of SDCWA which provides water to the following agencies located in the San Luis Rey River WMA on an annual basis: City of Oceanside (26,400 AF), Vista Irrigation District (ID) (17,800 AF), Vallecitos Water District (15,300 AF), Valley Center MWD (26,000 AF), Fallbrook PUD (12,300 AF), Rainbow MWD (20,200 AF), and Yuima MWD (4,900 AF) (SDCWA, 2015) (Figure 3-12). In addition, a small portion of the Camp Pendleton USMC Base is located within the San Luis Rey River WMA; the USMC is responsible for providing water services within Camp Pendleton. In addition, three of the tribal nations located within the San Luis Rey River Watershed have regulated Public Water

Systems that supply water to their respective reservations, including the Pala, La Jolla, and San Pasqual reservations. The Rincon reservation purchases raw water from Escondido and the Vista ID, and the San Pasqual reservation purchases treated water from Valley Center MWD.

There are two water supply reservoirs in the San Luis Rey River Watershed (Figure 3-10):

- Lake Henshaw, owned by Vista ID, can store up to 56,000 AF of surface water
- Turner Reservoir, owned by Valley Center MWD, can store up to 2,800 AF of surface water

Wastewater agencies within the San Luis Rey River WMA include the City of Oceanside, Fallbrook PUD, the Valley Center Community Services District (CSD), the City of Vista, Rainbow MWD, and the Pauma Valley CSD (Figure 3-12). The Pala Band of Mission Indians operates a tertiary wastewater treatment plant that serves most of the buildings located on the Pala Reservation.

Groundwater basins underlying the San Luis Rey River Watershed include the San Luis Rey Valley Basin, with an estimated total storage capacity of 240,000 AF (DWR, 1975); Warner Valley Basin, with an estimated total storage capacity of 550,000 AF (DWR, 1975); and Ranchita Town Area Basin, with an unknown estimated storage capacity (Figure 3-10).

In the San Luis Rey Valley Basin, water in this basin is of calcium-bicarbonate, calcium-sulfate-bicarbonate, and calcium-sulfate types, with a TDS content of 530 to 7,060 mg/L, and an average of approximately 1,258 mg/L (DWR, 2004j). Values for TDS ranged from 960 to 3,090 mg/L in 1983 (Izbicki, 1985). Groundwater in the Warner Valley Basin is predominantly sodium bicarbonate in character, though some calcium bicarbonate water is found in the southern part of the basin (DWR, 1967). Some sulfate and chloride rich water is found near Warner Hot Springs in the eastern part of the basin (DWR, 1967). Analyses of water sampled in the 1960s show a range in TDS content from 168 to 638 mg/L and an average about 304 mg/L (DWR, 1967). Water from one public supply well had a TDS content of 263 mg/L. Groundwater is generally rated suitable for irrigation and domestic uses except near Warner Hot Springs, where it is rated inferior for irrigation use because of sodium content and for domestic use because of high fluoride concentrations (DWR, 1967). Groundwater extracted from wells in the Ranchita Town Area Groundwater Basin is of sodium bicarbonate character and ranges in TDS content from about 250 to 500 mg/L (DWR, 1967). The water is classified as suitable for domestic and irrigation uses (DWR, 1967).

Flow down the San Luis Rey River and its tributaries and infiltration of runoff provide the majority of recharge for the basins. Vista ID and the City of Oceanside operate pumps in the Warner Valley and San Luis Rey Valley basins respectively.

3.2.5 Natural Resources

Figure 3-13 shows the parks and open space within the San Luis Rey River WMA, including Guajome Regional Park, San Luis Rey River Park, Keys Creek Preserve, Hellhole Canyon Preserve, Wilderness Gardens Preserve, Mount Olympus Preserve, Palomar Mountain, and Anza-Borrego Desert Park.

Figure 3-13 also shows that the San Luis Rey River WMA provides critical habitats for 7 species, including Thread-Leaved brodiaea, Least Bell's vireo, San Diego fairy shrimp, Spreading navarretia, Arroyo Southwestern toad, Laguna Mountains skipper, and the Southwestern willow flycatcher.

3.2.6 Watershed Processes

Prior to the 1960's, groundwater pumping in the western portion of the watershed led to lowering of groundwater levels, which led to seawater intrusion. Imported water eventually reduced the need to pump groundwater, however, increased development and increased irrigation with imported water has led to increased salt loading in the watershed and deteriorated groundwater quality.

The damming of the San Luis Rey River with the Henshaw Dam changed the hydrology of the river. Dams, water diversions, and flood control structures have had severe impacts on steelhead trout populations by cutting off access to upstream spawning and rearing habitats and reducing the flows necessary for trout immigration. Additionally, the Henshaw Dam and channelization of the San Luis Rey River has reduced transport and deposition of sand along the coast. Sand replenishment along the beaches is currently an important issue in the San Luis Rey River WMA.

3.3 Carlsbad

3.3.1 Carlsbad Watershed Management Area Description

The Carlsbad WMA is under the jurisdiction of several cities: Carlsbad, Escondido, San Marcos, Encinitas, Vista, Oceanside, and Solana Beach. The remaining area of the WMA is classified as unincorporated lands under County of San Diego jurisdiction (Figure 3-14). The watershed extends from above the headwaters of Lake Wohlford in the east to the Pacific Ocean in the west.

The Carlsbad WMA HU (904.00) encompasses 135,345 acres and consists of six HAs: Loma Alta (904.10), Buena Vista Creek (904.20), Agua Hedionda (904.30), Encinas (904.40), San Marcos (904.50), and Escondido Creek (904.60) (Figure 3-15).

The Carlsbad WMA contains several major stream systems that are each associated with one of the HAs. The Loma Alta Creek and Encinas Creek drain to the ocean, while Buena Vista Creek and Agua Hedionda Creek drain into their similarly named lagoons. San Marcos Creek drains into Batiquitos Lagoon and Escondido Creek drains into San Elijo Lagoon. The stream systems and other water features within the Carlsbad WMA are shown in Figure 3-16.

3.3.2 Land Use

Land use within the overall Carlsbad WMA is classified primarily as residential (36 percent), followed by open space/parks and recreation (18 percent), undeveloped land (16 percent), transportation (12 percent), agriculture (6 percent), industrial (3 percent), commercial (3 percent), and public facility (3 percent) uses. Commercial recreation, under construction, and water land uses make up less than 3 percent of the remaining acreage (Weston, 2012).

Figure 3-17 shows the division of land by agency. One tribal nation lives within the WMA on the San Pasqual Reservation. Additionally, a few small areas in the east of the WMA are managed by the BLM.

3.3.3 Water Quality

3.3.3.1 Applicable TMDLs and Special Biological Habitats

Carlsbad WMA TMDLs

Two TMDLs have been adopted in the Carlsbad WMA, including the Loma Alta Slough Bacteria TMDL (SDRWQCB, 2014) and the Revised TMDL for Indicator Bacteria, Project 1—Twenty Beaches and Creeks TMDL (SDRWQCB, 2010), which covers the shoreline along the San Marcos HA. Additionally, several lagoons and Agua Hedionda creek are on the Section 303(d) List of Water Quality Limited Segments for water quality impairments due to nutrients / eutrophication, bacteria, sediment/siltation, TDS, or a combination of these pollutants. TMDLs are in progress to address these impairments. The list of TMDLs adopted or in progress for the Carlsbad WMA is presented in Table 3-6.

TABLE 3-6
TMDLS IN THE CARLSBAD WMA

Subwatershed	Water Body Name	Pollutant	TMDL Adoption Date
Loma Alta (904.10)	Loma Alta Slough	Total Coliform Fecal Coliform Enterococcus	June 26, 2014
Loma Alta (904.10)	Loma Alta Slough	Nutrients/Eutrophication	In progress
Loma Alta (904.10)	Pacific Ocean Shoreline at Loma Alta Creek Mouth	Bacteria	In progress
Buena Vista Creek (904.20)	Buena Vista Lagoon	Nutrients/Eutrophication Sedimentation/Siltation Bacteria	In progress
Buena Vista Creek (904.20)	Pacific Ocean Shoreline adjacent to Buena Vista Lagoon	Bacteria	In progress
Agua Hedionda (904.30)	Lower Agua Hedionda Creek	TDS	In progress
San Marcos (904.50)	Pacific Ocean Shoreline	Bacteria	February 10, 2010
Escondido Creek (904.60)	San Elijo Lagoon	Nutrients/Eutrophication Sedimentation/Siltation Bacteria	In progress
Escondido Creek (904.60)	Pacific Ocean Shoreline at San Elijo Lagoon	Bacteria	N/A

SOURCE: Mikhail Ogawa Engineering (MOE), 2014

Special Biological Habitats

In the Carlsbad WMA, the following water bodies and areas are of special significance and can be classified as impaired for BIOL beneficial use:

- Pacific Ocean from Loma Alta HA
- Buena Vista Lagoon and Pacific Ocean from Lower Buena Vista Creek HA
- Agua Hedionda Lagoon, Agua Hedionda Creek, the Pacific Ocean, and Santa Ysabel Creek in the Agua Hedionda HA
- Batiquitos Lagoon and the Pacific Ocean in the Lower San Marcos HA
- San Elijo Lagoon, Escondido Creek, and the Pacific Ocean in the Escondido Creek HA

3.3.3.2 Priority Water Quality Conditions

The Carlsbad WMA WQIP (MOE, 2014) provides a detailed description of the process for determining the Priority Water Quality Conditions for this WMA. The WQIP identified receiving water conditions and impacts from MS4 discharges to assess and develop a list of priority water quality conditions. Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. An initial list of priority water quality conditions was developed and then compared with the public input that was provided during the July 2014 and November 2014 public workshops. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-7.

TABLE 3-7
PRIORITY WATER QUALITY CONDITIONS IN THE CARLSBAD WMA

Water Body	Dry Weather	Wet Weather
All water bodies within the WMA	• Trash	• Trash
All water bodies within the WMA	• Riparian Habitat	• Riparian Habitat
Loma Alta Slough	• Eutrophic • Indicator Bacteria	• Indicator Bacteria
Loma Alta Creek	• Toxicity	
Pacific Ocean Shoreline at Loma Alta Creek Mouth	• Indicator Bacteria	• Indicator Bacteria
Buena Vista Lagoon	• Indicator Bacteria • Sediment/Siltation • Nutrients	• Indicator Bacteria • Sediment/Siltation
Agua Hedionda Creek	• Indicator Bacteria • Nutrients Category	• Indicator Bacteria • Toxicity • Nutrients Category
Buena Creek	• Nitrate and Nitrite	
Pacific Ocean Shoreline at Moonlight Beach	• Indicator Bacteria	• Indicator Bacteria
San Marcos Creek, Lower	• Nutrients	
Encinitas Creek	• Toxicity	
San Marcos Lake	• Nutrients	• Nutrients

San Marcos Creek- Upper	• Nutrients	• Nutrients
San Marcos Creek- Upper below Via Vera Cruz	• Indicator Bacteria	• Indicator Bacteria
Escondido Creek	• Toxicity • Nutrients Category	• Indicator Bacteria • Nutrients Category
San Elijo Lagoon	• Indicator Bacteria • Sediment/Siltation N/A • Eutrophic	• Sediment/Siltation N/A

SOURCE: MOE, 2014

3.3.3.3 Highest Priority Water Quality Conditions

The Carlsbad WMA WQIP (MOE, 2014) presents the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-7. The Carlsbad WMA WQIP (MOE, 2014) used a similar method to the San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions for the Carlsbad WMA are provided in Table 3-8.

TABLE 3-8
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE CARLSBAD WMA

Water Body	Dry Weather	Wet Weather
Loma Alta Slough	• Bacteria at San Luis Rey River mouth • Bacteria in lower San Luis Rey River	• Bacteria at San Luis Rey River mouth • Bacteria in lower San Luis Rey River
Buena Vista Lagoon	• Nitrogen and Phosphorus • Eutrophic Conditions • Total Dissolved Solids • Index of Biotic Integrity • Chloride • Toxicity	• Nitrogen and Phosphorus • Total Dissolved Solids • Toxicity
Agua Hedionda		
Pacific Ocean Shoreline at Moonlight Beach	• Bacteria	• Bacteria
San Marcos Creek	• Nutrients	• Nutrients
Escondido Creek	• Riparian Habitat Degradation	• Riparian Habitat Degradation

SOURCE: MOE, 2014

3.3.4 Water Resources and Systems

SDCWA supplies water to ten water agencies in the Carlsbad WMA: 22,300 AF to City of Escondido annually, 26,400 AF to City of Oceanside, 20,600 AF to Carlsbad MWD, 22,000 AF to Olivenhain MWD, 5,700 AF to Rincon del Diablo MWD, 11,200 AF to Santa Fe ID, 7,100 AF to San Dieguito WD, 15,300 AF to Vallecitos WD, 26,000 AF to Valley Center MWD and 17,800 AF to Vista ID (SDCWA, 2015). The San Pasqual Band of Indians operates a Public

Water System and also purchases water from the Valley Center MWD. As such, within the Carlsbad Watershed there is a large amount of imported water use and limited amounts of other water supplies.

The Carlsbad Watershed is home to three potable water treatment plants: Escondido/Vista (capacity of 65 MGD), McCollom (capacity of 34 MGD), and Badger (capacity of 40 MGD). Water produced at these plants comes from storage or surface water in both the Carlsbad Watershed and the San Dieguito Watershed, and may be used outside the Carlsbad Watershed (RWMG, 2013).

A Carlsbad desalination facility opened on December 14, 2015 in Carlsbad, California, adjacent to the north end of the Encina Power Station. SDCWA is the recipient of the fresh water produced by the plant, which has an estimated output of 50 MGD.

Wastewater systems within the Carlsbad WMA include the Buena Sanitation District, the Leucadia Wastewater District, the Solana Beach Sanitation District, and the Rancho Santa Fe CSD. The La Salina Wastewater Treatment Plant treats sewage from areas west of I-5, downtown and along the coast. La Salina also treats waste to the secondary level by conventional biological treatment followed by clarification. The Encina Water Pollution Control Facility treats about 22 MGD of wastewater, with a capacity of over 40 MGD. Figure 3-18 shows a map of the water agencies and wastewater agencies within the Carlsbad WMA.

There are five major surface water bodies, which are used to store water, in the Carlsbad WMA (Figure 3-16):

- Lake Wohlford, owned by the City of Escondido, can store up to 6,506 AF of surface water.
- Dixon Lake, owned by the City of Escondido, can store up to 2,606 AF of surface and imported water.
- Lake San Marcos, a privately-owned lake, stores surface water and has a capacity of 480 AF.
- Olivenhain Reservoir, owned by SDCWA, stores up to 24,375 AF of natural runoff and water from Lake Hodges Reservoir (located in the San Dieguito River WMA).
- San Dieguito Reservoir, owned by the San Dieguito WD and the Santa Fe ID, stores up to 883 AF of imported water from SDCWA.

Groundwater basins underlying the Carlsbad Watershed include the Batiquitos Lagoon Basin (capacity unknown), San Elijo Valley Basin (capacity unknown), San Marcos Valley Basin (capacity unknown), and Escondido Valley Basin (estimated total storage capacity 24,000 AF (DWR, 1975)) (Figure 3-16).

In the Batiquitos Lagoon Basin, groundwater is predominantly sodium chloride in character and has an average TDS content of about 1,280 mg/L with a range from about 788 to 2,362 mg/L (DWR, 1967). The groundwater in this basin was rated inferior for irrigation because of high chloride content and marginal for domestic use because of high sulfate and TDS concentrations (DWR, 1967; DWR, 2004a).

In the San Elijo Valley Basin, groundwater mineral content is variable, depending on the source unit. Water from the eastern portion of the basin is of a mixed sodium, calcium, chloride, and sulfate character. In the western part of the basin, the water is of sodium-chloride character. TDS concentration ranges from 1,170 to 5,090 mg/L, with concentrations lowest in the eastern part of the basin and increasing toward the west (DWR, 2004i).

In the San Marcos Valley Basin, groundwater is chiefly magnesium chloride character in the northern part of the basin and sodium chloride in the southwestern part of the basin (DWR, 1967). TDS content measured prior to 1967 ranged between 500 and 750 mg/L; groundwater was rated suitable for domestic use and marginal for irrigation in the northern part of the basin, but inferior in the south (DWR, 1967; DWR, 2004k).

In the Escondido Valley Basin, groundwater is generally sodium chloride in type, with subordinate amounts of magnesium, calcium, bicarbonate, and nitrate ions (DWR, 1967). TDS content ranges from 250 to more than 5,000 mg/L (DWR, 1967). Local sources of groundwater in this basin are categorized as suitable to inferior for domestic use. The water categorized as inferior typically contains high nitrate, TDS, or sulfate content (DWR, 1967; DWR, 2004c).

Major recharge areas within the aforementioned groundwater basins include corresponding rivers or creeks and their tributaries as well as through stormwater infiltration.

3.3.5 Natural Resources

Figure 3-19 shows the parks and open space within the Carlsbad WMA, including Bottle Peak Preserve, Brengle Terrace Park, Buena Vista Park, Daley Ranch Park, Double Peak Regional Park, Escondido Creek, Hosp Grove Park, Lake Wohlford Park, Poinsettia Park, Sage Hill Preserve, San Elijo Lagoon Ecological Reserve, and Val Sereno Preserve. Areas of the watershed designated under the MSCP are also shown.

Figure 3-19 shows the critical habitat for six species within the Carlsbad WMA, including Thread-leaved brodiaea, San Diego fairy shrimp, Spreading navarretia, Riverside fairy shrimp, Southwestern willow flycatcher, and Western snowy plover.

Remaining native habitats within the watershed primarily include upland vegetation consisting of coastal sage scrub, chaparral scrub, and small areas of oak woodlands. In addition, the watershed contains native grasslands, riparian forests/woodlands, riparian scrubs, marsh/wetlands, and open water areas.

All four of the coastal lagoons located in the Carlsbad WMA (Agua Hedionda, Batiquitos, Buena Vista, and San Elijo) are important natural resources located within the Carlsbad Watershed (Figure 3-16).

3.3.6 Watershed Processes

The Carlsbad Watershed has water quality-related issues that are typical of areas with high urban development. Potential impacts to the watershed's water bodies and lagoons due to urbanization and highway development include increased sedimentation and water quality issues. Urbanization

also increases the amount of invasive species in the watershed, which can jeopardize native species and habitats. Although other issues may exist within the watershed, the Carlsbad WURMP (San Diego County, 2008b), which has a goal of reducing discharge of pollutants from MS4s, lists sedimentation, nutrient loading, and bacteria and pathogens as the primary management issues within the Carlsbad Watershed.

Due to urban development, many of the surface water bodies that drain into the watershed's lakes and lagoons have been channelized or otherwise modified, which causes increased sedimentation entering these water bodies Sedimentation has been linked to bacteria loading, as sediments may provide a breeding location for bacteria. Bacteria-related issues have led to temporary closures of recreational areas as well as impacts to natural resources (RWMG, 2013).

3.4 San Dieguito

3.4.1 San Dieguito Watershed Management Area Description

The San Dieguito River WMA includes portions of the City of Del Mar, the City of Escondido, the City of Poway, the City of San Diego, the City of Solana Beach, and unincorporated areas of San Diego County (Figure 3-20). The watershed extends from the Volcan Mountains in the east to San Dieguito Lagoon and the Pacific Ocean in the west.

The WMA drains an area of approximately 221,320 acres in west-central San Diego County, and consists of five HAs: Solana Beach (905.10), Hodges (905.20), San Pasqual (905.30), Santa Maria Valley (905.40), and Santa Ysabel (905.50). These five HAs are divided into 23 HSAs (Figure 3-21).

The San Dieguito River is the primary drainage in the watershed, with headwaters originating in the Witch Creek Basin. There are multiple tributaries that join the San Dieguito River, which all ultimately flow into the Pacific Ocean via the San Dieguito Lagoon (Figure 3-22).

3.4.2 Land Use

Land use within the San Dieguito River WMA is classified primarily as vacant and undeveloped land (39 percent). Other major land use classifications are open space/parks and recreation (22 percent), residential (18 percent), and agriculture (14 percent). Transportation, commercial, industrial, public facility, under construction, and water land use classifications combined comprise the remaining 7 percent of the watershed (San Diego County Association of Governments (SANDAG), 2009).

Figure 3-23 shows the division of land by agency. Two tribal nations live within the WMA on the Mesa Grande and the Santa Ysabel Reservations. Additionally, portions of the WMA are managed as the Cleveland National Forest and by the BLM, including BLM national conservation areas.

3.4.3 Water Quality

3.4.3.1 Applicable TMDLs and Special Biological Habitats

San Dieguito River WMA TMDLs

One TMDL has been developed in the San Dieguito River WMA: the Revised TMDL for Indicator Bacteria, Project 1—Twenty Beaches and Creeks in the San Diego Region (Table 3-9). The 2010 303(d) listing individually analyzed for the bacteria indicators (Enterococcus, fecal coliform, and total coliform) and identified total coliform as impairing the shellfish beneficial use at the mouth of the San Dieguito Lagoon (SDRWQCB, 2010).

All 2010 303(d) listings, whether a TMDL has been completed or is scheduled, were identified as receiving water conditions for the WQIP. Table 3-9 summarizes the 2010 303(d) listed impaired water bodies and the TMDLs in the San Dieguito River WMA, and the pollutants listed as causing the impairment.

TABLE 3-9
TMDLS AND WATER QUALITY LIMITED SEGMENTS IN THE SAN DIEGUITO RIVER WMA

Subwatershed	Water Body Name	Pollutant or Stressor	TMDL Adoption Date
Santa Ysabel (905.50)	Upper Santa Ysabel	• Toxicity	To be developed
Santa Ysabel (905.50)	Sutherland Reservoir	• Color • Iron • Manganese • Total nitrogen as N and pH	To be developed
San Pasqual (905.30)	Cloverdale Creek	• Total dissolved solids (TDS) • Phosphorus	To be developed
Hodges (905.20)	Green Valley Creek	• Sulfates • Chloride • Manganese • Phentachlorophenol (PCP)	To be developed
Hodges (905.20)	Kit Carson Creek	• TDS • PCP	To be developed
Hodges (905.20)	Lake Hodges	• Color • Manganese • Mercury • Nitrogen • Phosphorus • Turbidity • pH	To be developed
Solana Beach (905.10)	San Dieguito River	• Enterococcus • Fecal coliform • Nitrogen • Phosphorus • TDS • Toxicity	To be developed
Solana Beach (905.10)	Pacific Ocean Shoreline at San Dieguito Lagoon Mouth	• Total coliform	February 10, 2010
Solana Beach (905.10)	Pacific Ocean Shoreline at San Dieguito Lagoon Mouth	• Total coliform	To be developed

Special Biological Habitats

In the San Dieguito River WMA, the following water bodies and areas are of special significance and can be classified as (1) impaired for BIOL beneficial use; (2) impaired for other beneficial use(s); or (3) not impaired or not assessed:

- Impairment of BIOL:
  - None
- Impairment of other beneficial use(s):
  - Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth (2010 303(d) listed for impairment of Shellfish Harvesting beneficial use (SHELL) due to total coliform)
- Not impaired or have not been assessed:
  - San Dieguito Lagoon
  - Blue Sky Ecological Reserve
  - Boden Canyon Ecological Reserve
  - Lake Hodges Ecological Reserve

3.4.3.2 Priority Water Quality Conditions

The San Dieguito River WMA WQIP (AMEC, 2015a) provides a detailed description of the process for determining the Priority Water Quality Conditions for this WMA. The WQIP identified receiving water conditions and impacts from MS4 discharges to assess and develop a list of priority water quality conditions. Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. An initial list of priority water quality conditions was developed and then compared with the public input that was provided during the September 5, 2013, workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-10.

TABLE 3-10
PRIORITY WATER QUALITY CONDITIONS IN THE SAN DIEGUITO RIVER WMA

Water Body	Dry Weather	Wet Weather
San Dieguito River Above Sutherland Reservoir	• Color	• Color
Cloverdale Creek	• Eutrophic conditions (phosphorus) • TDS	
Green Valley Creek	• Chlorinefates • Sulfates	• Chlorine
Carson Creek	• TDS	

Felicita Creek	• TDS	
Lake Hodges	• Enterococcus • Color • Eutrophic conditions (nitrogen and phosphorus)	• Fecal coliform • Color
San Dieguito River	• Indicator Bacteria (Enterococcus and fecal coliform) • Toxicity • TDS • Eutrophic conditions (nitrogen)	• Indicator Bacteria (Enterococcus and fecal coliform) • Toxicity
Pacific Ocean Shoreline at San Dieguito Lagoon Mouth	• Indicator Bacteria (Enterococcus and fecal coliform)	• Indicator Bacteria (Enterococcus and fecal coliform)

SOURCE: AMEC, 2015a

3.4.3.3 Highest Priority Water Quality Conditions

The San Dieguito River WMA WQIP (AMEC, 2015a) provides the details of the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-10. The San Dieguito River WMA WQIP (AMEC, 2015a) used a similar method to the San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions are presented in Table 3-11.

TABLE 3-11
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE SAN DIEGUITO RIVER WMA

Highest Priority Condition	Dry Weather	Wet Weather
Potential Impairment of REC-1 at Pacific Ocean Shoreline	Indicator bacteria at San Dieguito River above Lake Hodges	Indicator bacteria at San Dieguito River above Lake Hodges
Potential Impairment of REC-1 at Pacific Ocean shoreline		Indicator bacteria at San Dieguito River below Lake Hodges

SOURCE: AMEC, 2015a

3.4.4 Water Resources and Systems

There are four water supply reservoirs within the San Dieguito Watershed, which contain either imported water or surface water runoff, or a combination of both sources. Each reservoir is summarized below (Figure 3-22):

- Sutherland Reservoir, owned by the City of San Diego, can store up to 29,508 AF of natural runoff.
- Lake Ramona, owned by the Ramona MWD, can store up to 12,000 AF of imported water from SDCWA.

- Lake Poway, owned by the City of Poway, can store up to 3,330 AF of imported water from SDCWA.
- Hodges Reservoir, owned by the City of San Diego, can store up to 30,633 AF of natural runoff and imported water from SDCWA.

SDCWA provides water to the following member agencies in the San Dieguito Watershed: Santa Fe ID (11,200 AF annually), San Dieguito WD (7,100 AF), Olivenhain MWD (22,200 AF), City of San Diego (191,700 AF), Rincon del Diablo MWD (8,900 AF), City of Poway (11,100 AF), and Ramona MWD (6,100 AF) (SDCWA, 2015). Two potable water treatment facilities are located in the San Dieguito Watershed: Bargar, which can treat up to 4 MGD potable water and Berglund, which can produce up to 24 MGD (RWMG, 2013). The Bargar filtration plant was built to treat water from Sutherland Reservoir. However, in order to comply with city regulations that require maintaining a specific water elevation in the lake and due to unreliable rainfall and runoff, water was not always available for treatment at the Bargar plant. The cost to treat a small amount of water was much higher than purchasing treated water from imported suppliers, so Bargar is not currently in operation.

Wastewater systems within the San Dieguito River WMA include the Solana Beach Sanitation District and the Rancho Santa Fe CSD, the Fairbanks Ranch CSD, and the Whispering Palms CSD.

The San Pasqual Academy Wastewater Treatment Plant treats domestic wastewater generated from the Academy campus and has a capacity of 0.05 MGD. The Rancho Santa Fe Wastewater Treatment Plant has an average flow of 0.35 MGD and a rated capacity of 0.45 MGD, and generally provides treatment services for Rancho Santa Fe and other surrounding communities in the unincorporated areas of the county. The Fairbanks Ranch Water Pollution Control Facility treats an average wastewater flow of 0.16 MGD. Whispering Palms Water Reclamation Facility treats an average wastewater flow of 0.26 MGD.

Figure 3-24 shows a map of the water agencies and wastewater agencies within the San Dieguito River WMA.

Groundwater basins underlying the San Dieguito Watershed include the San Pasqual Valley (estimated storage capacity of 63,000 AF (Izbicki, 1983) and 73,000 AF (DWR, 1975)), the Santa Maria Valley (estimated storage capacity of 77,000 AF (DWR 1975)), the San Dieguito Valley (estimated storage capacity of 52,000 AF (Izbicki, 1983) and 63,000 AF (DWR, 1975)), and the Pamo Valley (capacity unknown). The majority of the San Pasqual Valley groundwater basin is owned by the City of San Diego. While public water supply is not currently developed from the San Pasqual basin, the basin represents a potential source of local water supply (RWMG, 2013).

Groundwater in the San Pasqual Valley Basin is of mixed character. In the eastern part of the valley, groundwater is mainly calcium bicarbonate character with TDS content mostly less than 500 mg/L. In the western part of the valley, groundwater is dominantly sodium chloride in character with sulfate as a prominent minor anion (Izbicki, 1983). TDS concentration in the basin

ranges from 350 to 1,790 mg/L. Nitrate concentration ranges up to 91.7 mg/L; elevated nitrate concentration is widespread (DWR, 2004l).

Groundwater in the Santa Maria Valley Basin is predominately sodium chloride in character; however, water of sodium sulfate and sodium bicarbonate character is found in the northern part of the basin (DWR, 1967). The most prevalent combinations of major cations are sodium-magnesium-calcium, sodium-calcium-magnesium, and sodium, and the most common major anion combinations are bicarbonate-chloride, chloride-bicarbonate, and chloride. Analyses of groundwater from this basin conducted in the 1960s indicate that TDS content can range from 164 to 1,287 mg/L and average about 456 mg/L (DWR, 1967). This groundwater was rated as generally suitable for domestic and irrigation uses (DWR, 1967). Water from two public supply wells had TDS concentrations of 590 and 750 mg/L (DWR, 2004n). Sulfate, nitrate, and TDS concentrations are high for domestic use (DWR, 1975) and locally high chloride content produced water rated as marginal for irrigation (DWR, 1967). High nitrate concentrations are more common in the central and eastern parts of the basin (DWR, 2004n).

Groundwater in the Pamo Valley Basin is calcium bicarbonate in character and rated suitable for domestic and irrigation uses. TDS content ranges from 279 to 455 mg/L and averages about 369 mg/L (DWR, 1967; DWR, 2004f).

Recharge of the groundwater basins occurs through infiltration and percolation of flows from the San Dieguito River and other ephemeral streams.

The San Dieguito Watershed also has facilities that are part of SDCWA's Emergency Storage Project. The Hodges Reservoir Project connected the Hodges Reservoir to Olivenhain Reservoir (located in the Carlsbad Watershed) through pipelines and pump stations, which provides multiple benefits including a more resilient water supply and flood protection.

3.4.5 Natural Resources

Figure 3-25 shows the parks and open space within the San Dieguito River WMA, including Black Mountain Park, Carmel Valley Open Space, San Dieguito Regional Park, Kit Carson Park, Mt. Woodson Open Space, Ramona Grassland Preserve, San Pasqual Trails Open Space, Santa Fe Valley Preserve, Santa Ysabel East Preserve, Santa Ysabel West Preserve, Simon Preserve, Volcan Mountain Wilderness Preserve. Areas of the watershed designated under the MSCP are also shown on Figure 3-25.

Due to relatively undeveloped nature of the San Dieguito Watershed, the watershed contains a diverse array of habitats that range from Volcan Mountain in the east to the San Dieguito Lagoon and Pacific Ocean in the west. There are several natural areas within the watershed, including the 55-mile long, 80,000 acre San Dieguito River Park, the 150 acre San Dieguito Lagoon, and natural areas associated with the watershed's surface water reservoirs (RWMG, 2013).

The San Dieguito River WMA also provides critical habitat for six species, including Thread leaved brodiaea, San Diego fairy shrimp, Spreading navarretia, Arroyo Southwestern toad, Southwestern willow flycatcher, and Western snowy plover (Figure 3-25).

3.4.6 Watershed Processes

Although the San Dieguito River WMA is a largely undeveloped watershed, it still suffers from the impacts of urbanization. Stakeholders within the San Dieguito Watershed have identified a number of major issues and concerns, including physical and hydrologic modifications, water quality, invasive species, and flooding associated with local surface waters. Over-grazing has also been a concern in the San Dieguito Watershed because it has reduced tree regeneration, reduced vegetative cover, caused streambank destabilization, water quality degradation, and spread non-native weeds (RWMG, 2013).

3.5 Los Peñasquitos

3.5.1 Los Peñasquitos Watershed Management Area Description

The Los Peñasquitos WMA is located within west-central San Diego County and includes portions of the City of San Diego, the City of Poway, and the City of Del Mar, as well as unincorporated areas of San Diego County (Figure 3-26). The area extends from the foothills east of the City of Poway to the coastal plain where the watershed drains into Los Peñasquitos Lagoon before flowing into the Pacific Ocean through a narrow mouth at Torrey Pines State Beach.

The Los Peñasquitos WMA (HU 906.00) is 60,424 acres and encompasses the drainage areas of Los Peñasquitos Creek (37,028 acres), Carmel Creek (11,180 acres), and Carroll Canyon Creek (11,004 acres). The remaining 1,107 acres is composed of the lagoon and coastal drainages. The Los Peñasquitos WMA consists of two HAs: Miramar Reservoir (906.10) and Poway (906.20) (Weston, 2012). The HAs are shown on Figure 3-27.

Figure 3-28 shows a map of the major water features within the Los Peñasquitos WMA. The Miramar Reservoir HA comprises the western portion of the WMA and contains the drainage areas of Carmel Creek, Carroll Canyon Creek, and the lower portion of the Los Peñasquitos Creek. The Poway HA, located to the east, is covered entirely by the upper portion of the Los Peñasquitos Creek subwatershed. The drainage areas of the three creeks flow to Los Peñasquitos Lagoon.

3.5.2 Land Use

Land use within the Los Peñasquitos WMA is classified primarily as open space/parks and recreation (31 percent), residential (27 percent), vacant and undeveloped land (12 percent), transportation (13 percent), and industrial (7 percent). Other land use classifications within the watershed, each comprising 3 percent or less of the total land use, include agriculture, commercial, commercial recreation, military, public facility, under construction, and water (SANDAG, 2009).

Figure 3-29 shows the division of land by agency. A portion of the WMA is operated by the U.S. Fish and Wildlife Service as wildlife refuge land.

3.5.3 Water Quality

3.5.3.1 Applicable TMDLs and Special Biological Habitats

Los Peñasquitos WMA TMDLs

Two TMDLs have been adopted in the Los Peñasquitos WMA. The Pacific Ocean Shoreline at Torrey Pines State Beach at Del Mar was 303(d) listed in 2010 for total coliform as impairing shellfish beneficial use. The Sediment TMDL for the Lagoon was adopted on June 13, 2012 (SDRWQCB, 2012a). Table 3-12 summarizes the impaired 2010 303(d) listed water bodies in the Los Peñasquitos WMA.

TABLE 3-12
TMDLS AND WATER QUALITY LIMITED SEGMENTS IN THE LOS PEÑASQUITOS WMA

Subwatershed	Water Body Name	Pollutant	TMDL Adoption Date
Miramar Reservoir (906.10)	Miramar Reservoir	Total nitrogen as N	To be developed
Miramar Reservoir (906.10)	Soledad Canyon	Sediment toxicity	To be developed
Miramar Reservoir (906.10)	Soledad Canyon	Selenium	To be developed
Miramar Reservoir (906.10)	Los Peñasquitos Creek	Enterococcus, fecal coliform, selenium, total dissolved solids (TDS), and total nitrogen as N	To be developed
Miramar Reservoir (906.10)	Los Peñasquitos Lagoon	Toxicity	To be developed
Miramar Reservoir (906.10)	Los Peñasquitos Lagoon	Sedimentation and siltation	June 13, 2012
Miramar Reservoir (906.10)	Pacific Ocean Shoreline at Torrey Pines State Beach, Del Mar	Bacteria	February 10, 2010
Miramar Reservoir (906.10)	Pacific Ocean Shoreline at Los Peñasquitos River Mouth	Total coliform	To be developed
Poway (906.20)	Poway Creek	Selenium and toxicity	To be developed

Special Biological Habitats

In the Los Peñasquitos WMA, the following water bodies and areas are of special significance and can be classified as (1) impaired for BIOL beneficial use; (2) impaired for other beneficial use(s); or (3) not impaired or assessed (AMEC, 2015b):

- Impairment of BIOL:
  - Los Peñasquitos Lagoon (2010 303(d) listed for sedimentation and siltation)
- Impairment of other beneficial use(s):
  - Pacific Ocean Shoreline at Los Peñasquitos River Mouth (2010 303(d) listed for impairment of Shellfish Harvesting (SHELL) due to total coliform)

  - Los Peñasquitos Creek (2010 303(d) listed for impairment of warm freshwater habitat beneficial use (WARM) because of *Enterococcus*, fecal coliform, and total nitrogen, and impairment of agricultural supply beneficial use (AGR) due to TDS)

- Not impaired or assessed:
  - Del Mar Mesa/Lopez Ridge Ecological Reserve
  - Meadowbrook Ecological Reserve

3.5.3.2 Priority Water Quality Conditions

The Los Peñasquitos WMA WQIP (AMEC, 2015b) provides a more detailed description of the process for determining the Priority Water Quality Conditions for this WMA. An initial list of priority water quality conditions was developed in the WQIP by comparing receiving water conditions with evidence of MS4 contributions. The initial list was then compared with the public input that was provided during the September 4, 2013 workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-13.

TABLE 3-13
PRIORITY WATER QUALITY CONDITIONS IN THE LOS PEÑASQUITOS WMA

Water Body	Wet Weather	Dry Weather
Miramar Reservoir	• Impairment of WARM due to eutrophic conditions (total nitrogen as N)	
Soledad Canyon Creek	• Impairment of WARM due to selenium	• Impairment of WARM due to selenium
Soledad Canyon Creek		• Elevated *Enterococcus* near NPDES • monitoring locations
Soledad Canyon Creek	• Elevated fecal coliform near NPDES • monitoring locations	
Soledad Canyon Creek		• Elevated TDS near NPDES monitoring • locations
Poway Creek	• Impairment of WARM due to selenium and • toxicity	• Impairment of WARM due to selenium and • toxicity
Los Peñasquitos Creek	• Impairment of WARM due to Enterococcus	• Impairment of WARM due to Enterococcus
	• Impairment of WARM due to fecal coliform	• Impairment of WARM due to fecal coliform
	• Impairment of WARM due to toxicity	• Impairment of WARM due to toxicity
		• Impairment of WARM due to eutrophication • (total nitrogen)

Water Body	Wet Weather	Dry Weather
		• Elevated total phosphorus and dissolved • phosphorus near NPDES monitoring locations
	• Impairment of AGR due to TDS	• Impairment of AGR due to TDS
Los Peñasquitos Lagoon	• Impairment of Estuarine Conditions (EST) and BIOL due to • hydromodification, siltation, and • sedimentation	
		• Impairment of (estuarine habitat) EST and BIOL due to freshwater discharges
		• Elevated Enterococcus near NPDES monitoring locations •
	• Elevated fecal coliform near NPDES monitoring locations	
	• Elevated TDS near NPDES monitoring • locations	
		• Elevated total phosphorus, dissolved • phosphorus, benthic algae, and total nitrogen near NPDES monitoring locations •
Pacific Ocean Shoreline at Torrey Pines State Beach at Del Mar	• Impairment of REC-1 due to indicator bacteria • (total coliform, fecal coliform, Enterococcus)	• Impairment of REC-1 due to indicator bacteria • (total coliform, fecal coliform, Enterococcus)
Pacific Ocean Shoreline Los Peñasquitos River Mouth	• Impairment of shellfish harvesting beneficial use (SHELL) due to total coliform	• Impairment of SHELL due to total coliform

SOURCE: AMEC, 2015b

3.5.3.3 Highest Priority Water Quality Conditions

The Los Peñasquitos WQIP (AMEC, 2015b) presents the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-13. The Los Peñasquitos WMA WQIP (AMEC, 2015b) used a similar method to the San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions are presented in Table 3-14.

TABLE 3-14
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE LOS PEÑASQUITOS WMA

Highest Priority Condition	Dry Weather	Wet Weather
Impairment of EST and BIOL in Los Peñasquitos Lagoon		• Hydromodification, • Siltation/ Sedimentation
Impairment of EST and BIOL in Los Peñasquitos Lagoon	• Freshwater Discharges	
Potential impairment of REC-1 along the Pacific Ocean Shoreline at Torrey Pines State Beach at Del Mar	• Indicator Bacteria	• Indicator Bacteria

SOURCE: AMEC, 2015b

3.5.4 Water Resources and Systems

The Los Peñasquitos WMA contains one water storage facility, Lake Miramar, and one groundwater basin, the Poway Valley basin.

There are three water agencies in the Los Peñasquitos WMA that receive water from SDCWA: City of Del Mar (receives 1,100 AF annually), City of San Diego (191,700 AF), and the City of Poway (11,100 AF) (SDCWA, 2015) (Figure 3-30).

Imported water is purchased from SDCWA and stored in the Miramar Reservoir. The reservoir has a capacity of 2,341 million gallons (MG) (CSD, 2011). Adjacent to the reservoir is Miramar Water Treatment Plant operated by the City of San Diego (Figure 3-30). The Miramar Plant produces 140 MGD, but has a 215 MGD total capacity (CSD, 2010).

Most of the wastewater in the Los Peñasquitos WMA is treated at Point Loma Wastewater Treatment Plant operated by the City of San Diego. The Point Loma Plant is located on the bluffs of Point Loma and treats approximately 175 MGD (CSD, 2012a). Wastewater is also treated at the North City Water Reclamation Plant, operated by the City of San Diego. The North City Plant can treat up to 30 MGD. Reclaimed water produced by the North City Plant is distributed to Mira Mesa, Miramar Ranch North, Scripps Ranch, Torrey Pines, and the City of Poway (CSD, 2012b).

The Poway Valley Groundwater Basin has two water bearing formations: the Alluvium and Residuum, and the Poway Group (DWR, 2004g). Groundwater in this basin is mainly sodium chloride in character and ranges in TDS content from about 750 to 1,500 mg/L (DWR, 1967). Calcium bicarbonate character water is found in wells near Beeler Creek. Water from one public supply well had a TDS content of 610 mg/L (DWR, 2004g). Recharge in the basin is mainly from direct precipitation on the valley flow and infiltration along Poway Creek, which flows into the basin from the east. Other sources of recharge include septic tank effluent and irrigation waters. It is estimated the Poway Valley Groundwater Basin contains 23,000 AF and is mainly used for agriculture and domestic uses (AMEC, 2005).

3.5.5 Natural Resources

Figure 3-31 shows the parks and open space within the Los Peñasquitos WMA, including the Los Peñasquitos Canyon Open Space, Black Mountain Park, Sycamore Canyon/Goodan Ranch Preserve, Poway Community Park, Silverset Neighborhood Park, Sabre Springs Open Space, Scripps Miramar Open Space, Canyon Hills Park, Mcgonigle Canyon Open Space, Del Mar Mesa, Mira Mesa Park, Mira Mesa Vernal Pool Open Space, Carroll Canyon Open Space, Campus Point Open Space, Shaw Valley Open Space, Ashley Falls Preserve, Solana Highlands Preserve, Sorrento Hills Open Space, Torrey Pines State Reserve. Areas of the watershed designated under the MSCP are also included in Figure 3-31.

The Los Peñasquitos WMA provides critical habitat for two species, including San Diego fairy shrimp and the Spreading navarretia (Figure 3-31).

3.5.6 Watershed Processes

Land use changes within the Los Peñasquitos WMA began in 1823 with the advent of cattle ranching. Over the subsequent decades, land within the WMA was cleared for cattle grazing, which enabled more sediment erosion during storm events (Cole and Wahl, 2000). Urban development, including the construction of Interstates 5 and 805, increased rapidly from 1966 through 1999 and undeveloped land decreased from 87 percent to 57 percent of the watershed area (White and Greer, 2006). These changes have led to increased pollutants loads within the watershed, increased erosion, and subsequent downstream sedimentation.

With the increase of impervious surfaces in the watershed, less stormwater can infiltrate into the ground, and more is instead directed to natural waterways or the MS4, where flows are consolidated and released through storm outfalls. This means that the peak (and total) flow in the creeks is greater and occurs more rapidly than under undeveloped conditions (with fewer impervious surfaces). This can cause significant erosion in the natural drainages and canyon walls, which receive these discharges, as the geomorphology shifts to transport the larger flow. The higher peak flows possess greater energy, which can mobilize greater amounts and sizes of sediment. Sedimentation rates in Los Peñasquitos Lagoon likely increased by an order of magnitude from 0.27 mm/year pre-settlement to 3.5 mm/year post-settlement because of affects associated with land use changes (Cole and Wahl, 2000). Additionally, increased freshwater inputs from urban sources have greatly impacted the health of Los Peñasquitos Lagoon, impairing water quality and contributing to the loss of native salt marsh through habitat conversion.

3.6 Mission Bay

3.6.1 Mission Bay Watershed Management Area Description

The Mission Bay WMA is located entirely within the City of San Diego jurisdiction. (Figure 3-32). The watershed extends from near Poway in the east to Mission Bay and the Pacific Ocean in the west.

The Mission Bay WMA (within the Los Peñasquitos HU 906.00) encompasses 43,268 acres. The watershed includes six HAs: Scripps (HA 906.30), Miramar (HA 906.40), Tecolote (HA 906.50), Vacation Isle (HA 906.60), Fiesta Island (HA 906.70), and Mission Bay (HA 906.80). The Scripps HA is included in the Mission Bay WMA although it technically also drains to the Los Peñasquitos WMA and to the Pacific Ocean as well (Figure 3-33).

The Mission Bay WMA includes two major drainages: the Rose Creek and Tecolote Creek. Rose Creek drains to the northeast corner of Mission Bay and Tecolote Creek drains to the southeast corner of the Bay.

3.6.2 Land Use

Land use within the Mission Bay WMA is classified primarily as open space/parks and recreation (26 percent), residential (26 percent), and transportation (16 percent). Other land use classifications include vacant and undeveloped land (6 percent), water (5 percent), public facility (5 percent), military (5 percent), industrial (4 percent), commercial (4 percent), and commercial recreation (3 percent). Agriculture and under construction land uses each make up less than 1 percent of the land use acreage (Weston, 2012).

Figure 3-35 shows the division of land by agency. Portions of the WMA are managed as a U.S. Fish and Wildlife Service (U) Wildlife Refuge.

3.6.3 Water Quality

3.6.3.1 Applicable TMDLs and Special Biological Habitats

Mission Bay WMA TMDLs

One TMDL (the Bacteria TMDL) has been adopted in the Mission Bay WMA. The receiving waters covered by the Bacteria TMDL are summarized in Table 3-15.

TABLE 3-15
TMDLS AND WATER QUALITY LIMITED SEGMENTS IN THE MISSION BAY WMA

Subwatershed	Water Body Name	Pollutant or Stressor	Adoption Date
Scripps (906.30)	Pacific Ocean Shoreline	• Bacteria	June 10, 2010
Scripps (906.30), Miramar (906.40), Tecolote (90.50)	Mission Bay Shoreline	• Bacteria	To be developed
Miramar (906.40)	Rose Creek	• Selenium • Toxicity	To be developed
Tecolote (906.50)	Mission Bay at mouth of Tecolote Creek	• Eutrophic • Lead	To be developed
Tecolote (906.50)	Tecolote Creek	• Indicator Bacteria	June 10, 2010
Tecolote (906.50)	Tecolote Creek	• Cadmium • Copper • Lead	To be developed

		• Nitrogen • Phosphorus • Selenium • Toxicity • Turbidity • Zinc	
Scripps (906.30)	Mission Bay at Quivira Basin	• Copper	To be developed
Tecolote (906.50)	Mission Bay Shoreline at Tecolote Shores	• Enterococcus • Total Coliform	To be developed

Special Biological Habitats

In the Mission Bay WMA, the following water body is of special significance:

- Pacific Ocean Shoreline at the La Jolla ASBS (ASBS Number 29)

3.6.3.2 Priority Water Quality Conditions

The Mission Bay WMA WQIP (AMEC, 2016) provides a detailed description of the process for determining the Priority Water Quality Conditions for this WMA. The WQIP identified receiving water conditions and impacts from MS4 discharges to assess and develop a list of priority water quality conditions. Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. An initial list of priority water quality conditions was developed and then compared with the public input that was provided during the September 7, 2013 workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-16.

TABLE 3-16
PRIORITY WATER QUALITY CONDITIONS IN THE MISSION BAY WMA

Water Body	Dry Weather	Wet Weather
Mission Bay Shoreline at Campland	• Bacteria	• Bacteria
Mission Bay Shoreline at De Anza		• Bacteria
Mission Bay Shoreline at Leisure Lagoon	• Bacteria	• Bacteria
Mission Bay Shoreline at North Crown Point		• Bacteria
Mission Bay at Mouth of Rose Creek	• Potential eutrophic conditions (no pollutant specified) • Lead	• Lead
Mission Bay Shoreline at Visitor's Center		• Bacteria
Rose Creek	• Toxicity • TDS	• Toxicity • TSS

Water Body	Dry Weather	Wet Weather
Tecolote Creek	• Bacteria • Potential eutrophic conditions (Phosphorus) • Turbidity	• Bacteria • Turbidity
Mission Bay Shoreline at Tecolote Shores		• Bacteria
Area of Special Biological Significance, La Jolla Shores ASBS 29		• Bacteria • Copper • Sediment
Mission Bay Shoreline at Bahia Point		• Bacteria
Mission Bay Shoreline at Bonita Cove	• Bacteria	• Bacteria
Mission Bay Shoreline at Fanuel Park	• Bacteria	• Bacteria
Pacific Ocean Shoreline, Casa Beach (Children's Pool)		• Bacteria
Pacific Ocean Shoreline, La Jolla Cove	• Bacteria	• Bacteria
La Jolla Shores Beach at Avenida de la Playa	• Bacteria	• Bacteria
Pacific Ocean Shoreline, La Jolla Shores Beach at Caminito del Oro	• Bacteria	• Bacteria
Pacific Ocean Shoreline, La Jolla Shores Beach at El Paseo Grande	• Bacteria	• Bacteria
Pacific Ocean Shoreline, Pacific Beach at Grand Avenue	• Bacteria	• Bacteria
Pacific Ocean Shoreline, Pacific Beach at Pacific Beach Point	• Bacteria	• Bacteria
Pacific Ocean Shoreline, South Casa Beach at Coast Boulevard	• Bacteria	• Bacteria
Pacific Ocean Shoreline, Tourmaline Surf Park	• Bacteria	• Bacteria
Pacific Ocean Shoreline at Vallecitos Court		• Bacteria
Pacific Ocean Shoreline at La Jolla Shores Beach at Vallecitos		• Bacteria
Pacific Ocean Shoreline at Windansea Beach at Bonair Street	• Bacteria	• Bacteria
Pacific Ocean Shoreline at Windansea Beach at Palomar Ave.	• Bacteria	• Bacteria
Pacific Ocean Shoreline at Windansea Beach at Playa del Norte	• Bacteria	• Bacteria
Pacific Ocean Shoreline at Windansea Beach at Vista de la Playa	• Bacteria	• Bacteria
Pacific Ocean Shoreline at Whispering Sands Beach at Ravina Street	• Bacteria	• Bacteria

SOURCE: AMEC, 2016

3.6.3.3 Highest Priority Water Quality Conditions

The Mission Bay WMA WQIP (AMEC, 2016) provides the details of the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-16. The Mission Bay WMA WQIP (AMEC, 2016) used a similar method to San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions are presented in Table 3-17.

TABLE 3-17
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE MISSION BAY WMA

Highest Priority Condition	Dry Weather	Wet Weather
Impairment of REC-1 in Tecolote Creek	• Indicator bacteria in Tecolote Creek Subwatershed	• Indicator bacteria in Tecolote Creek Subwatershed
Impairment of ASBS 29	• N/A	• Sediment in Scripps Subwatershed
Potential Impairment of REC-1 at Pacific Ocean shoreline	• Indicator Bacteria in Scripps Subwatershed	• Indicator Bacteria in Scripps Subwatershed

SOURCE: AMEC, 2016c

3.6.4 Water Resources and Systems

No water supply agencies or reservoirs exist within the Mission Bay WMA.

A small portion of the Mission Valley Groundwater Basin exists under the southern portion of the WMA. The primary source of recharge for this basin is infiltration of stream flow from the San Diego River. In 1975 DWR estimated storage capacity to be 42,000 AF for this basin. In 1997 SDCWA estimated a total storage capacity of about 40,000 AF (DWR, 2004d). In the basin, magnesium and sulfate are high for domestic use. Chloride and TDS concentrations are high for domestic and irrigation use. Seawater intrusion is suspected (DWR, 1975; DWR, 2004d).

There is one wastewater treatment plant, the Metro Biosolids Center, which is located adjacent to the Miramar Landfill. The Metro Biosolids Center provides two treatment options: thickening and digestion of the raw solids generated at the North City Water Reclamation Plant, and the dewatering of the wet biosolids from both the Point Loma Wastewater Treatment Plant and North City Water Reclamation Plant. The facility produces dewatered biosolids.

Figure 3-34 shows a map of the water features within the Mission Bay WMA. Figure 3-36 shows a map of the water agencies and wastewater agencies within the Mission Bay WMA.

3.6.5 Natural Resources

Figure 3-37 shows the parks and open space within the Mission Bay WMA, including Hickman Field Park, Kate Sessions Memorial Park, Kearny Mesa Community Park, Kelly Street Preserve, La Jolla Heights Natural Park, Marian Bear Park, Mission Bay Athletic Area, Mission Bay Park,

Mt. Acadia Park, Nobel Athletic Area, Rose Canyon Open Space, Tecolote Canyon Park, Torrey Pines State Preserve, and University Gardens Preserve.

The Mission Bay WMA provides critical habitat for two species: San Diego fairy shrimp and the Spreading navarretia (Figure 3-37).

3.6.6 Watershed Processes

In the 1940s, much of the existing coastal wetlands along Mission Bay was converted to a 4,000-acre aquatic park and residential land use area. Although Mission Bay Park is one of San Diego's principal tourism and leisure destinations, the development along the shores has led to water quality issues in the Bay and significant losses of wetlands.

Significant changes in the natural hydrology and geomorphology in the watershed have led to sedimentation issues in Mission Bay. Sources of sediment include erosion of canyon banks, exposed soils, bluffs, and scouring of stream banks, which have been exacerbated by land development in the watershed. Sediments enter Mission Bay from various sources, including Rose Creek, and impact water quality of the Bay.

The Kendall-Frost Marsh is located in the northeast corner of Mission Bay and receives flows containing urban runoff, pollutants, and sediments from stormwater outfalls. Historically, Rose Creek was connected to the marsh and provided freshwater inflows along with nutrients and sediment to the marsh. Since Rose Creek has been channelized, it no longer provides these necessary inputs to Kendall-Frost Marsh. The City of San Diego and the Audubon Society are currently looking at wetland restoration opportunities for the northeast corner of Mission Bay, including Kendall-Frost Marsh and Rose Creek.

3.7 San Diego River

3.7.1 San Diego River Watershed Management Area Description

The San Diego River WMA (HU 907) encompasses 277,554 acres. The San Diego River WMA consists of 75 percent County of San Diego unincorporated land. The remaining jurisdictional areas of the watershed include the City of El Cajon, City of La Mesa, City of San Diego, City of Santee, as well as several unincorporated jurisdictions (Figure 3-38). Although the County of San Diego generally would have land use authority in unincorporated areas, a significant percentage of this unincorporated area is under the jurisdiction of the federal government or sovereign Indian tribes and, thus, effectively outside the jurisdictional land use authority of the County.

The WMA consists of four HAs: Lower San Diego River (907.10), San Vicente (907.20), El Capitan (907.30), and Boulder Creek (907.40). These HAs are further broken down into 14 HSAs. The HUs and HAs for the San Diego River WMA are shown in Figure 3-39.

The San Diego River WMA consists of a single major drainage, the San Diego River, which flows through the entire WMA. Major San Diego River tributaries consist of Boulder Creek,

Cedar Creek, Conejos Creek, Chocolate Creek, Los Coches Creek, San Vicente Creek, and Forester Creek (Figure 3-40).

3.7.2 Land Use

Land use within the San Diego River WMA is predominantly undeveloped (44 percent). Other land use classifications include open space/parks and recreation (23 percent), residential (19 percent), and transportation (6 percent). Agriculture, commercial, commercial recreation, industrial, military, public facility, and water land uses each make up less than 2 percent of the land use acreage (Weston, 2012).

Figure 3-41 shows the division of land by agency, including the military facilities at Marine Corps Air Station Miramar. The tribal nations of the Barona Band of Mission Indians, the Capitan Grande Group of Mission Indians, and the Inaja-Cosmit Band of Indians are located within the upper San Diego River Watershed. Part of the WMA is managed as the Cleveland National Forest. Additionally, portions of the WMA are managed by the BLM and categorized as BLM National conservation areas.

3.7.3 Water Quality

3.7.3.1 Applicable TMDLs and Special Biological Habitats

San Diego River WMA TMDLs

One TMDL, the Revised TMDL for Indicator Bacteria, Project 1—Twenty Beaches and Creeks in the San Diego Region (SDRWQCB, 2010), has been adopted in the San Diego River WMA. This covers bacteria in the Lower San Diego River as well as for Forester Creek. A draft TMDL is under development for Famosa Slough (SDRWQCB, 2016c). Table 3-18 summarizes the TMDLs and impaired 2010 303(d) listed water bodies in the San Diego River WMA and the pollutants listed as causing the impairment. The locations of these water bodies are mapped in Figure 3-40.

TABLE 3-18
TMDLS AND WATER QUALITY LIMITED SEGMENTS IN THE SAN DIEGO RIVER WMA

Sub Watershed	Water Body Name	Pollutant	Adoption Date
Lower San Diego (907.10)	Forester Creek	Bacteria	February 10, 2010
Lower San Diego (907.10)	Lower San Diego River	Bacteria	February 10, 2010
Lower San Diego (907.10)	Pacific Ocean Shoreline	Bacteria	February 10, 2010
Lower San Diego (907.10)	Famosa Slough	Eutrophication	In progress

Special Biological Habitats

In the San Diego River WMA, the following water bodies and areas are of special significance and can be classified as impaired for BIOL beneficial use:

- Rios Canyon
- San Diego River

3.7.3.2 Priority Water Quality Conditions

The San Diego River WMA WQIP (LWA, 2016b) provides a more detailed description of the process for determining the Priority Water Quality Conditions for this WMA. Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. An initial list of priority water quality conditions was developed in the San Diego River WMA WQIP (LWA, 2016b) by comparing receiving water conditions with evidence of MS4 contributions. The initial list was then compared with the public input that was provided during the October 3, 2013 and June 26, 2014 workshops and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshops and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors (Table 3-19).

TABLE 3-19
PRIORITY WATER QUALITY CONDITIONS IN THE SAN DIEGO RIVER WMA

Water Body	Dry Weather	Wet Weather
Famosa Slough and Channel	• Eutrophic	
Forester Creek	• Indicator Bacteria • Total Dissolved Solids	• Indicator Bacteria
Murray Reservoir	• Nitrogen	
Pacific Ocean Shoreline, at the San Diego River outlet, at Dog Beach	• Enterococcus • Total Coliform	• Enterococcus • Total Coliform
Lower San Diego River	• Enterococcus • Fecal Coliform • Nitrogen • Phosphorus • Total Dissolved Solids • IBI	• Enterococcus • Fecal Coliform
El Capitan Lake	• Phosphorus • Total Nitrogen as N	

SOURCE: LWA, 2016b

3.7.3.3 Highest Priority Water Quality Conditions

The San Diego River WMA WQIP (LWA, 2016b) presents the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-19. The San Diego River WMA WQIP (LWA, 2016b) used a similar method to the San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions are presented in Table 3-20.

TABLE 3-20
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE SAN DIEGO RIVER WMA

Water Body	Dry Weather	Wet Weather
Forester Creek	• Indicator Bacteria	• Indicator Bacteria
Pacific Ocean Shoreline, at the San Diego River outlet, at Dog Beach	• Enterococcus • Total Coliform	• Enterococcus • Total Coliform
Lower San Diego River	• Enterococcus • Fecal Coliform	• Enterococcus • Fecal Coliform

SOURCE: LWA, 2016b

3.7.4 Water Resources and Systems

The following watershed agencies in the San Diego River Watershed received water from SDCWA in 2015: City of San Diego (191,700 AF annually), Helix WD (31,100 AF), Padre Dam MWD (11,300 AF), Lakeside WD (3,700 AF), and Ramona MWD (6,100 AF) (SDCWA, 2015). Wastewater agencies include: City of San Diego, Padre Dam MWD, City of La Mesa, and City of El Cajon (Figure 3-42).

There are five reservoirs in the San Diego River WMA (Figure 3-40):

- El Capitan Reservoir, owned by the City of San Diego, can store up to 112,800 AF of surface water.
- San Vicente Reservoir, owned by the City of San Diego, can store up to 242,000 AF of both imported and surface water after project completion.
- Cuyamaca Reservoir, owned by Helix WD, can store up to 8,200 AF of surface water.
- Lake Jennings, owned by Helix WD, can store up to 9,800 AF of surface water.
- Lake Murray, owned by the City of San Diego, can store up to 4,800 AF of surface water.

Significant groundwater resources exist within the watershed, including the Mission Valley, San Diego River Valley, and El Cajon Valley groundwater basins (Figure 3-40). In 1975 DWR estimated the San Diego River Valley Groundwater Basin had a capacity of 97,000 AF. The total capacity of the El Cajon Valley groundwater basin is estimated to be about 32,500 AF (DWR, 1975). Groundwater use, however, is limited in downstream portions of the WMA due to high TDS concentrations. Additionally, a petroleum plume underneath Qualcomm Stadium and its parking lots impacts groundwater in Mission Valley.

3.7.5 Natural Resources

Figure 3-43 shows the parks and open space within the San Diego River WMA, including Anza-Borrego Desert State Park, Barnett Ranch Preserve, Boulder Oaks Preserve, Cuyamaca Mountain State Park, Mission Trails Open Space, Simon Preserve, Santa Ysabel East Preserve, and

Sycamore Canyon Open Space. Figure 3-43 also shows areas of the San Diego River WMA designated under the MSCP.

The San Diego River WMA provides critical habitat for five species, including Least Bell's vireo, San Diego fairy shrimp, Spreading navarretia, Arroyo Southwestern toad, and Southwestern willow flycatcher (Figure 3-43).

3.7.6 Watershed Processes

Major issues in the San Diego Watershed consist of urbanization and its effects on water quality, hydromodification, loss of habitat, and the presence of non-native species. Increased urban development has increased the impervious surface area in the watershed leading to increased urban runoff impacting surface water quality. Urbanization has, and will likely continue to affect the watershed hydrology and sediment transport patterns without proper management. Also at risk are the loss of native habitat in the watershed due to increased development and the presence of non-native invasive species. Invasive non-native plant species have been a significant problem of concern in the San Diego Watershed for many years. Many of the invasive non-native plants contribute to flooding, are a fire risk, and degrade native habitats.

Portions of the San Diego River have been altered and constrained due to heavy mining operations. Sand mining has impacted portions of the San Diego River by allowing sand to accumulate in the River, which creates ponding of water. Ponded water rapidly decreases its dissolved oxygen levels, negatively impacting aquatic life. Many mining operations in the San Diego River valley, however, are currently being phased out and restoration projects are underway.

3.8 San Diego Bay

3.8.1 San Diego Bay Watershed Management Area Description

The San Diego Bay WMA encompasses 282,584 acres and includes many jurisdictions, including the cities of San Diego, La Mesa, Lemon Grove, Chula Vista, Coronado, National City, Imperial Beach, the San Diego Unified Port District, the San Diego County Regional Airport Authority, and the County of San Diego. A map of the jurisdictions in the San Diego Bay WMA is provided in Figure 3-44. The watershed extends from the headwaters of the Sweetwater River in the east to San Diego Bay and the Pacific Ocean in the west.

The San Diego Bay WMA is different from other WMAs in San Diego County. The WMA comprises three very distinct HUs that are not hydrologically interconnected, but that have one final downstream receiving water body, namely San Diego Bay. The three HUs are Pueblo (908.00), Sweetwater (909.00), and Otay (910.00) (Figure 3-45). The Pueblo San Diego HU is comprised of three HAs: Point Loma (908.10), San Diego Mesa (908.20), and National City (908.30). The Sweetwater HU is comprised of three HAs: Lower Sweetwater (909.10), Middle Sweetwater (909.20), and Upper Sweetwater (909.30). The Otay HU is comprised of three HAs: Coronado (910.10), Otay (910.20), and Dulzura (910.30).

Major waterways within the San Diego Bay WMA include Otay River, Sweetwater River, Chollas Creek, Paradise Creek, Paleta Creek, and Switzer Creek (Figure 3-46).

3.8.2 Land Use

Land use within the overall San Diego Bay WMA is classified primarily as open space/parks and recreation (32 percent) and vacant and undeveloped land (25 percent). Other uses include residential (23 percent) and transportation (9 percent). Agriculture, commercial, commercial recreation, industrial, military, public facility, water, and under construction land uses each comprise 2 percent or less of the overall land use acreage (Weston, 2012).

Land use categories within the San Diego Bay WMA are shown on Figure 3-47, including multiple military facilities, including Naval Submarine Base San Diego, Fleet Anti-Submarine Warfare, Naval Base San Diego, Naval Amphibious Base Coronado, and Brown Field Naval Auxiliary Air Station. Four tribal nations live within the WMA: the Viejas, Cuyapaipe, Jamul Indian Village, and Sycuan Reservations. Portions of the WMA are managed as the Cleveland National Forest and the United States Fish and Wildlife Service (USFWS) Wildlife Refuge. Other parts of the WMA are managed by the BLM, including BLM Lands, BLM Wilderness Areas, and BLM National conservation areas.

3.8.3 Water Quality

3.8.3.1 Applicable TMDLs and Special Biological Habitats

San Diego Bay WMA TMDLs

Five TMDLs have been adopted in the San Diego Bay WMA. These include three for Chollas Creek (diazinon, metals, and bacteria), a copper TMDL for the Shelter Island Yacht Basin, and a Bacteria TMDL for multiple locations along the San Diego Bay shoreline. Table 3-21 summarizes the TMDLs that have been adopted or are in progress in the San Diego Bay WMA.

TABLE 3-21
TMDLS AND WATER QUALITY LIMITED SEGMENTS IN THE SAN DIEGO BAY WMA

Subwatershed	Water Body Name	Pollutant	Adoption Date
National City (908.10)	Chollas Creek	Diazinon	August 14, 2002
National City (908.30)	Chollas Creek	Copper, Lead, Zinc	June 13, 2007
National City (908.30)	Chollas Creek	Bacteria	February 10, 2010
Dulzura (908.10)	Shelter Island Yacht Basin	Copper	February 9, 2005
Dulzura (908.10), San Diego Mesa (908.20), National City (908.30), Lower Sweetwater (909.10)	San Diego Bay Shoreline	Bacteria	June 11, 2008
Dulzura (908.10), San Diego Mesa (908.20), National City (908.30), Lower Sweetwater (909.10), Coronado (910.10)	San Diego Bay	Marine Sediment	In progress

Special Biological Habitats

In the San Diego Bay WMA, the following water bodies and areas are of special significance and are classified as (1) impaired for BIOL beneficial use, (2) impaired for other beneficial use(s); or (3) not impaired:

- Impairment of BIOL:
  - None
- Impairment of other beneficial use(s):
  - San Diego Bay: 303(d)-listed for impaired Commercial, and Sport Fishing (COMM) (Polychloric Biphenyls (PCBs));
  - San Diego Bay Shoreline, North of 24th Street Marine Terminal: 303(d)-listed for impaired marine habitats beneficial use (MAR) (benthic community effects and sediment toxicity);
  - San Diego Bay Shoreline, Seventh Street Channel: 303(d)-listed for impaired MAR (benthic community effects and sediment toxicity);
  - Pacific Ocean Shoreline, Point Loma HA, at Bermuda Avenue: 303(d)-listed for impaired REC-1 and SHELL (total coliform);
  - San Diego Bay Shoreline, at Americas Cup Harbor: 303(d)-listed for impaired EST (copper);
  - San Diego Bay Shoreline, near Submarine Base: 303(d)-listed for impaired MAR (benthic community effects, sediment toxicity, and toxicity);
  - San Diego Bay Shoreline, Shelter Island Shoreline Park: 303(d)-listed for impaired REC-1 (Enterococcus, fecal coliform, and total coliform);
  - San Diego Bay, Shelter Island Yacht Basin: 303(d)-listed for impaired EST (dissolved copper);
  - San Diego Bay Shoreline, 32nd St. San Diego Naval Station: 303(d) listed for impaired (benthic community effects and sediment toxicity);
  - San Diego Bay Shoreline, at Harbor Island (East Basin): 303(d) listed for EST (copper);
  - San Diego Bay Shoreline, at Harbor Island (West Basin): 303(d)-listed for impaired EST (copper);
  - San Diego Bay Shoreline, at Marriott Marina: 303(d)-listed for impaired EST (copper);
  - San Diego Bay Shoreline, at Spanish Landing: 303(d)-listed for impaired REC-1 and SHELL (total coliform);
    - San Diego Bay Shoreline, Between Sampson and 28th Streets: 303(d)-listed for impaired MAR (copper and Polycyclic aromatic hydrocarbons (PAHs)), commercial and sport fishing beneficial use (COMM) (mercury and PCBs), and WARM (zinc);
  - San Diego Bay Shoreline, Downtown Anchorage: 303(d)-listed for impaired MAR (benthic community effects and sediment toxicity);

  - San Diego Bay Shoreline, G Street Pier: 303(d)-listed for impaired REC-1 and SHELL (total coliform);
  - San Diego Bay Shoreline, near Chollas Creek: 303(d)-listed for impaired MAR (benthic community effects and sediment toxicity);
  - San Diego Bay Shoreline, near Coronado Bridge: 303(d)-listed for impaired MAR (benthic community effects and sediment toxicity);
  - San Diego Bay Shoreline, near Switzer Creek: 303(d)-listed for impaired MAR (chlordane and PAHs);
  - San Diego Bay Shoreline, Vicinity of B St and Broadway Piers: 303(d)-listed for impaired MAR (Benthic community effects and sediment toxicity and REC-1 and SHELL (total coliform);
  - San Diego Bay Shoreline, at Bayside Park (J Street): 303(d)-listed for impaired REC-1 (Enterococcus and total coliform);
  - San Diego Bay Shoreline, Chula Vista Marina: 303(d)-listed for impaired EST (copper);
  - Pacific Ocean Shoreline, Coronado HA, at Silver Strand (north end, Oceanside): 303(d)-listed for impaired REC-1 (Enterococcus);
  - Pacific Ocean Shoreline, Imperial Beach Pier: 303(d)-listed for impaired REC-1 (fecal coliform and total coliform) and COMM (PCBs);
  - Pacific Ocean Shoreline, Otay Valley HA, at Carnation Ave and Camp Surf Jetty: 303(d)-listed for impaired REC-1 (total coliform);
  - San Diego Bay Shoreline, at Coronado Cays: 303(d)-listed for impaired EST (copper);
  - San Diego Bay Shoreline, at Glorietta Bay: 303(d)-listed for impaired EST (copper);
  - San Diego Bay Shoreline, Tidelands Park: 303(d)-listed for impaired REC-1 (Enterococcus and total coliform); and
  - Jamul Creek: 303(d)-listed for impaired WARM (toxicity).
- Not impaired:
  - San Diego Bay National Wildlife Refuge (NWR)–Sweetwater Marsh Unit; and
  - San Diego Bay NWR–South Bay Unit.

3.8.3.2 Priority Water Quality Conditions

The San Diego Bay WMA WQIP (SDBRP, 2016) provides a detailed description of the process for determining the Priority Water Quality Conditions for this WMA. Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. An initial list of priority water quality conditions was developed in the San Diego Bay WMA WQIP (SDBRP, 2016) by comparing receiving water conditions with evidence of MS4 contributions. The initial list was then compared with the public input that was provided during the September 5, 2013 workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect

conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-22.

TABLE 3-22
PRIORITY WATER QUALITY CONDITIONS IN THE SAN DIEGO BAY WMA

HA/HAS, Water Body	Dry Weather	Wet Weather
Point Loma/908.1, Shelter Island Yacht Basin	• Metals (Dissolved Copper),	• Metals (Dissolved Copper),
Point Loma/908.1, Shelter Island Shoreline Park	• Bacteria	• Bacteria
Pueblo, San Diego Mesa/908.22, Chollas Creek	• Metals (Dissolved Copper, zinc, and lead)	• Metals (Dissolved Copper, zinc, and lead)
San Diego Mesa/908.22, Chollas Creek		• Bacteria
San Diego Mesa/908.22, Chollas Creek	• Diazinon	• Diazinon
San Diego Mesa/908.22, Chollas Creek	• Phosphorus	• Total Nitrogen
San Diego Mesa/908.22, Chollas Creek	• Trash	• Trash
San Diego Mesa/908.22, Chollas Creek (at Mouth)		• PAHs
San Diego Mesa/908.22, Chollas Creek (at Mouth)		• Chlordane
Diego Mesa/908.22, Chollas Creek (at Mouth)		• PCBs
San Diego Mesa/ 908.2, San Diego Bay Shoreline, between Sampson and 28th Streets	• PAHs	• PAHs
San Diego Mesa/908.2, San Diego Bay Shoreline, between Sampson and 28th Streets	• Mercury	• Mercury
San Diego Mesa/908.2, San Diego Bay Shoreline, between Sampson and 28th Streets	• PCBs	• PCBs
San Diego Mesa/908.2, San Diego Bay Shoreline, between Sampson and 28th Streets	• Zinc	• Zinc
San Diego Mesa/908.2, San Diego Bay Shoreline, near Switzer Creek (at the Mouth)		• PAHs
San Diego Mesa/908.2, San Diego Bay Shoreline, near Switzer Creek (at the Mouth)		• PCBs
San Diego Mesa/908.2, San Diego Bay Shoreline, near Switzer Creek (at the Mouth)		• Chlordane
National City/908.3, Mouth of Paleta Creek/Seventh Street Channel		• PAHs
National City/908.3, Mouth of Paleta Creek/Seventh Street Channel		• PCBs
National City/908.3, Mouth of Paleta Creek/Seventh Street Channel		• Chlordane
Lower Sweetwater (909.1), Lower Sweetwater River below reservoir	• Bacteria	• Bacteria
Lower Sweetwater (909.1), Lower Sweetwater River below reservoir	• Nutrients	• Nutrients
Lower Sweetwater (909.1)	• Trash	• Trash
Middle Sweetwater (909.2)	• Bacteria	• Bacteria
Coronado/910.1, Pacific Ocean Shoreline at Carnation Ave and Camp Surf Jetty	• Bacteria	• Bacteria
Coronado/910.1, Pacific Ocean Shoreline at Tidelands Park	• Bacteria	• Bacteria
Dulzura/910.3, Lower Otay Reservoir	• Nitrogen	• Nitrogen

SOURCE: SDBRPs, 2016

3.8.3.3 Highest Priority Water Quality Conditions

The San Diego Bay WMA WQIP (SDBRPs, 2016) presents the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-22. The San Diego Bay WMA WQIP (SDBRPs, 2016) used a similar method to the San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions are presented in Table 3-23.

TABLE 3-23
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN SAN DIEGO BAY WMA

Impaired Water Body	Pollutant/Stressor	Beneficial Use Impaired
Chollas Creek	• Bacteria • Dissolved copper, lead, and zinc	Water Quality

SOURCE: SDBRPs, 2016

3.8.4 Water Resources and Systems

The San Diego Bay WMA is served by multiple water districts receiving water from SDCWA in 2015, including the City of San Diego (191,700 AF), South Bay ID (13,600 AF annually), Helix WD (31,100 AF), Otay WD (34,500 AF), and Padre Dam MWD (11,300 AF) (SDCWA, 2015) (Figure 3-48). The Viejas Reservation and Sycuan Reservation located within the Sweetwater HU both operate onsite water systems (3-48).

The Metropolitan (Metro) Sewerage System, owned by the City of San Diego and operated by the San Diego Metro Wastewater Joint Powers Authority, serves the majority of the Pueblo HU (Figure 3-48). National City has its own wastewater division that maintains the City's sanitary sewer main and lines, closed storm collection systems, and pump stations. The Metro Sewerage System is responsible for treating most of the wastewater from cities located in the Pueblo HU, along with the western portions of the Sweetwater and Otay Watersheds. Other Wastewater Agencies within the WMA include Lemon Grove and Spring Valley (Figure 3-48).

Otay Water Treatment Plant is located near Savage Dam and is the only water treatment plant in the Otay HU. The Otay Water Treatment Plant is a conventional water treatment plant with a capacity to treat up to 40 MGD, though it currently produces approximately 34 MGD (CSD, 2011). Developed cities within the Otay HU, including portions of Chula Vista, San Diego, and Imperial Beach, are connected to the sewer system. The few developments in the unincorporated areas in the north, south, and east portion of the Otay HU are all connected to septic systems.

The Pueblo HU uses imported water and water stored in reservoirs in other HUs. The Sweetwater HU has two major reservoirs, Loveland Reservoir and Sweetwater Reservoir, which are both operated by Sweetwater Authority. Both reservoirs trap rainfall and melting snow from the surrounding mountains and store natural runoff. Combined, both reservoirs can store approximately 52,200 AF of water. The Otay HU contains two major water supply reservoirs:

- Upper Otay Reservoir, owned by the City of San Diego, can store up to 2,825 AF.

- Lower Otay Reservoir, owned by the City of San Diego, can store up to 49,800 AF of surface and imported waters.

There are three groundwater basins located in the San Diego Bay WMA (Figure 3-46). No groundwater supply is currently developed within the Pueblo HU, but portions of the San Diego Formation (a deep confined groundwater aquifer) underlie portions of the watershed (Figure 3-46). Groundwater production in the Pueblo HU is limited due to lack of storage capacity in the basin, availability of groundwater recharge, and degraded water quality. Portions of the Mission Valley Groundwater Basin also underlie the Pueblo HU.

The Sweetwater Valley Groundwater Basin is a large groundwater basin that empties into the San Diego Bay underlying the Pueblo and Sweetwater HUs (Figure 3-46). Generally, the groundwater in the alluvium is of a sodium-calcium chloride character, with a TDS concentration ranging from 300 to more than 50,000 mg/L. In the San Diego Formation, the water is of a sodium chloride character and the TDS content ranges from 600 to 1,600 mg/L (USACOE 1982). Data from 9 public supply wells shows TDS concentration ranging from 1,249 to 3,320 mg/L, with an average of approximately 2,114 mg/L. TDS, chloride and sodium content of the groundwater generally exceed the recommended limits for drinking (DWR, 2004o). Groundwater in the Sweetwater HU is pumped by Sweetwater Authority.

The Otay Valley Groundwater Basin has unknown storage capacity(DWR, 2004e). Groundwater in the coastal plain part of this basin has a sodium chloride character and ranges in TDS content from about 500 to more than 2,000 mg/L (DWR, 2004e). Groundwater in the eastern portion of the basin ranges from sodium-calcium bicarbonate-chloride to sodium-calcium chloride-bicarbonate in character (DWR, 1967). Concentration of TDS in water from the San Diego Formation ranges from 342 to about 12,000 mg/L throughout the region (DWR, 2004e). Groundwater is rated marginal to inferior for domestic use in the coastal plain because of high TDS content and suitable in the eastern part of the basin (DWR, 1967). Water is rated marginal to inferior for irrigation use for most of the basin because of high chloride concentrations (DWR, 1967). Groundwater production in the Otay HU is mostly from private wells for domestic use and irrigation in the unincorporated eastern portions of the HU. Recharge in the basin is derived from percolation of precipitation, stream-flow originating in the valley highlands, return of applied water, and from the rare releases from the Lower Otay Reservoir during flood conditions.

3.8.5 Natural Resources

Figure 3-49 shows the parks and open space within the San Diego Bay WMA, including Balboa Park, Cuyamaca Mountain State Park, Cuyamaca Rancho State Park, Lawrence and Barbara Daley Preserve, Otay Valley Regional Park, Pilcha Community Park, Stoneridge Preserve, and Sweetwater Regional Park. Approximately 36 square miles of the Otay HU is part of the MSCP (Figure 3-49).

The San Diego Bay WMA provides critical habitat for nine species, including Least Bell’s vireo, Otay tarplant, San Diego fairy shrimp, Spreading navarretia, Quino checkerspot butterfly, Arroyo Southwestern Toad, Riverside Fairy shrimp, Southwestern willow flycatcher, and Western snowy plover (Figure 3-49).

3.8.6 Watershed Processes

Major issues in the San Diego Bay WMA consist of surface water quality degradation, habitat degradation, and sediment toxicity in San Diego Bay due to urbanization. Due to damming, the Sweetwater River is now nearly dry most of the year except during the winter, when releases are made from the Loveland Reservoir. These releases have had an impact on the arroyo toad, a federally listed endangered species and a state species of special concern. Similarly, the Otay River flows are significantly controlled via dams and reservoirs which has significantly altered the River flow regimes. The altered flow regime impacts habitat, the chemical and physical characteristics of the River, and the sediment distribution downstream (RWMG, 2013).

3.9 Tijuana

3.9.1 Tijuana Watershed Management Area Description

The Tijuana River Watershed is the largest of the San Diego watersheds. It encompasses over 1.1 million acres, 299,263 of which are in San Diego County. The Tijuana River WMA makes up 27 percent of the full Tijuana watershed and is under the jurisdiction of three separate entities, including the County of San Diego, City of San Diego, and City of Imperial Beach. The remaining area of the watershed (73 percent) is within the jurisdiction of Mexico (Figure 3-50).The Tijuana River is formed by two drainage networks that merge in the City of Tijuana, flow across the U.S. border into the Tijuana River Estuary, and ultimately drain to the Pacific Ocean.

The portion of the WMA located in San Diego County is comprised of the following eight HAs: Tijuana Valley (911.10), Potrero (911.20), Barrett Lake (911.30), Monument (911.40), Morena (911.50), Cottonwood (911.60), Cameron (911.70), and Campo (911.80). There are 18 HSAs in the Tijuana River WMA. The HUs and HAs for the Tijuana River WMA are shown in a map provided in Figure 3-51.

Major water bodies in the WMA include the Tijuana River, Cottonwood Creek, Barrett Lake, Lake Morena, Pine Valley Creek, Campo Creek, and Tijuana River Estuary (Figure 3-52). On the Mexican side of the border, major water bodies include Tecate Creek, Rio Alamar, and Rodriguez Reservoir.

This SWRP covers only the portion of the Tijuana Watershed located within San Diego County and not the portions that extend into Mexico.

3.9.2 Land Use

Dominant land uses in the U.S. portion of the watershed are vacant and undeveloped land (59 percent) and open space/parks and recreation (25 percent). Other land uses include residential (9 percent), agriculture (3 percent), and transportation (2 percent). Commercial, commercial recreation, industrial, military, public facility, construction, and water land uses account for the remaining 2 percent of the land area in the U.S. portion of the watershed (SANDAG, 2009). The land use in the Mexican portion of the WMA is predominately vacant and undeveloped land

(81.8 percent). Much of Mexico's lands classified as undeveloped are used for low-intensity cattle and goat grazing (Weston, 2012).

Land use categories within the Tijuana River WMA are shown on Figure 3-53, including military facilities at Naval Outlying Field Imperial Beach and U.S. Navy LA Posta Microwave Station. Tribal lands associated with four separate tribal reservations are located within the U.S. portion of the upper Tijuana Watershed. Those tribal reservations include the Cuyapaipe Reservation, Manzanita Reservation, La Posta Reservation, and Campo Reservation. These tribal lands account for approximately 8 percent of the total area of the Tijuana Watershed that is located within the U.S. Portions of the WMA are managed as the Cleveland National Forest and the USFWS Wildlife Refuge. Other parts of the WMA are managed by the BLM, including BLM Lands, BLM Wilderness Areas, and BLM National conservation areas.

3.9.3 Water Quality

3.9.3.1 Applicable TMDLs and Special Biological Habitats

Tijuana River WMA TMDLs

No TMDLs have been adopted for the Tijuana River WMA, but a bacteria TMDL is in progress for the Tijuana River and Estuary (Table 3-24).

TABLE3-24
TMDLS AND WATER QUALITY LIMITED SEGMENTS IN THE TIJUANA RIVER WMA

Sub Watershed	Water Body Name	Pollutant	Adoption Date
Tijuana Valley (911.10)	Tijuana River and Estuary	• Bacteria	In progress

Special Biological Habitats

Biological habitats of special significance within the Tijuana River WMA include the following portions of the Tijuana River Estuary (SDRWQCB, 2012c):

- Tijuana Estuary Natural Preserve, designated as a Natural Preserve by the State Park and Recreation Commission;
- Tijuana River National Estuarine Research Reserve, designated a National Estuarine Research Reserve by the National Oceanic and Atmospheric Administration, including Border Field State Park; and
- Tijuana Slough NWR, managed by the USFWS as part of the NWR System.

3.9.3.2 Priority Water Quality Conditions

The Tijuana River WMA WQIP (URS, 2016) provides a detailed description of the process for determining the Priority Water Quality Conditions for this WMA. The WQIP identified receiving water conditions and impacts from MS4 discharges to assess and develop a list of priority water quality conditions. Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. An initial

list of priority water quality conditions was developed and then compared with the public input that was provided during the January 28, 2013 workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the third-party data. Finally, the overall potential for improvement of MS4 discharges to affect conditions within the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is presented in Table 3-25.

TABLE 3-25
PRIORITY WATER QUALITY CONDITIONS IN THE TIJUANA RIVER WMA

Water Body	Dry Weather	Wet Weather
Tijuana River	• Impairment of WARM because of Sedimentation/Siltation/Solids/TSS • Elevated turbidity • Impairment of REC-1 because of indicator bacteria • Impairment of WARM because of low DO • Impairment of WARM because of nutrients • Impairment of REC-1 because of surfactants (MBAS) • Impairment of REC-2 because of trash • Impairment of WARM because of pesticides • Impairment of MUN because of synthetic organics • Impairment of WARM because of toxicity	• Impairment of WARM because of Sedimentation/Siltation/Solids/TSS • Elevated turbidity • Impairment of REC-1 because of indicator bacteria • Impairment of WARM because of low DO • Impairment of WARM because of nutrients • Impairment of REC-1 because of surfactants (MBAS) • Impairment of REC-2 because of trash
Tijuana River Estuary	• Impairment of MAR because of turbidity • Impairment of REC-1 because of indicator bacteria • Impairment of MAR because of low DO • Impairment of REC-2 because of trash	• Impairment of MAR because of turbidity • Impairment of REC-1 because of indicator bacteria • Impairment of MAR because of low DO • Impairment of REC-2 because of trash
Pacific Ocean Shoreline	• Impairment of REC-1 because of indicator bacteria	• Impairment of REC-1 because of indicator bacteria
Campo Creek	• Elevated indicator bacteria (dry weather) • Elevated nutrients (dry weather) • Elevated TDS (dry weather)	
Barrett Lake	• Impairment of WARM because of nutrients	• Impairment of WARM because of nutrients
Morena Reservoir		• Impairment of WARM because of nutrients

SOURCE: URS, 2016

3.9.3.3 Highest Priority Water Quality Conditions

The Tijuana River WMA WQIP (URS, 2016) provides the details of the process that assessed and identified the Highest Priority Water Quality Conditions based on the list of priority water quality conditions presented above in Table 3-24. The Tijuana River WMA WQIP (URS, 2016) used a

similar method to the San Luis Rey River WMA WQIP (LWA, 2016a) as discussed in Section 3.2.3.3. The highest priority water quality conditions are presented in Table 3-26.

TABLE 3-26
HIGHEST PRIORITY WATER QUALITY CONDITIONS IN THE TIJUANA RIVER WMA

Highest Priority Condition	Dry Weather	Wet Weather
Tijuana River		• Sedimentation/Siltation
Tijuana River		• Turbidity
Tijuana Estuary		• Turbidity

SOURCE: URS, 2016

3.9.4 Water Resources and Systems

Two water agencies serve the Tijuana River WMA, the City of San Diego and Otay WD, which both purchase water from SDCWA. In 2015 SDCWA provided 191,700 AF to the City of San Diego and 34,500 AF to the Otay WD. The Tijuana River WMA has two water supply reservoirs where purchased water can be stored:

- Morena Reservoir, owned by City of San Diego, can store up to 50,700 AF of surface water (CSD, 2012d).
- Barrett Reservoir, owned by City of San Diego, can store up to 34,800 AF of surface water (CSD, 2012c).

The Tijuana River WMA has four underlying groundwater basins: Tijuana, Cottonwood Valley, Campo Valley, and Potrero Valley (Fig 3-52). The Tijuana groundwater basin (estimated storage capacity 50,000 to 80,000 AF (DWR, 1975)) underlies the portion of the coastal Tijuana River Valley that lies in California. In the Tijuana groundwater basin, the alluvium contains water of sodium chloride character. TDS content for this water typically ranges from 1,120 to 3,620 mg/L, although, less than 1,000 mg/L is found beneath some side canyons (Izbicki, 1985). Groundwater in the San Diego Formation is sodium chloride in character and TDS content ranges from 380 to 2,360 mg/L (Izbicki, 1985). Chloride and sulfate concentrations have exceeded the maximum contaminant level (MCL) in some wells in the basin (Izbicki, 1985). The MCL for aluminum, barium, lead, selenium, and silver concentrations are exceeded individually in some wells in the basin (DWR, 2006). Cottonwood Valley groundwater basin (storage capacity unknown) underlies portions of Cottonwood, Cameron, and La Posta Valley in eastern San Diego County. Groundwater in this basin is predominantly calcium bicarbonate in character with TDS content ranging from about 130 to 645 mg/L (DWR, 1967). Campo Valley groundwater basin (estimated storage capacity estimated 63,450 AF (Erickson and Kingery, 1983)) underlies the Campo Valley. The alluvium contains water of calcium bicarbonate character. Electrical conductivity readings are around 800 µmho (Erickson and Kingery, 1983). In the 1960s, TDS concentrations ranged from 219 to 480 mg/L (DWR 1967) and in the 1970s were less than 800 mg/L (DWR, 2003). The groundwater in this basin was generally rated suitable for domestic and irrigation uses (DWR, 1967). Potrero Valley groundwater basin (storage capacity unknown) underlies a small

valley 30 miles inland from San Diego and about two miles from the Mexican border. In this basin, water character is variable, with calcium and sodium as the dominant cations and bicarbonate and chloride as the dominant anions (DWR 1967). TDS content ranges from 283 to 305 mg/L, and groundwater is designated as suitable for domestic and irrigation use (DWR, 1967). Recharge for the groundwater basins in the Tijuana River WMA is primarily from percolation from ephemeral stream flow or reservoir releases. Some recharge also occurs from irrigation and discharge from septic tanks.

The Metro Sewerage System, owned by the City of San Diego and operated by the San Diego Metro Wastewater Joint Powers Authority, serves the lower portion of the WMA (Figure 3-54). The South Bay International Wastewater Treatment Plant, located in San Diego County just two miles west of the San Ysidro Port of Entry treats sewage originating in Tijuana, Mexico and discharges it to the Pacific Ocean. The South Bay Water Reclamation Plant is a water reclamation plant owned and operated by the City of San Diego, and located in the Tijuana River Valley (RWMG, 2013).

3.9.5 Natural Resources

Figure 3-55 shows the parks and open space within Tijuana River WMA, including Border Field State Park, Lake Morena Park, Cuyamaca Rancho State Park, Otay Mitigation Site, and Potrero Park. Areas of the Tijuana River WMA designated under the MSCP are also shown in Figure 3-55.

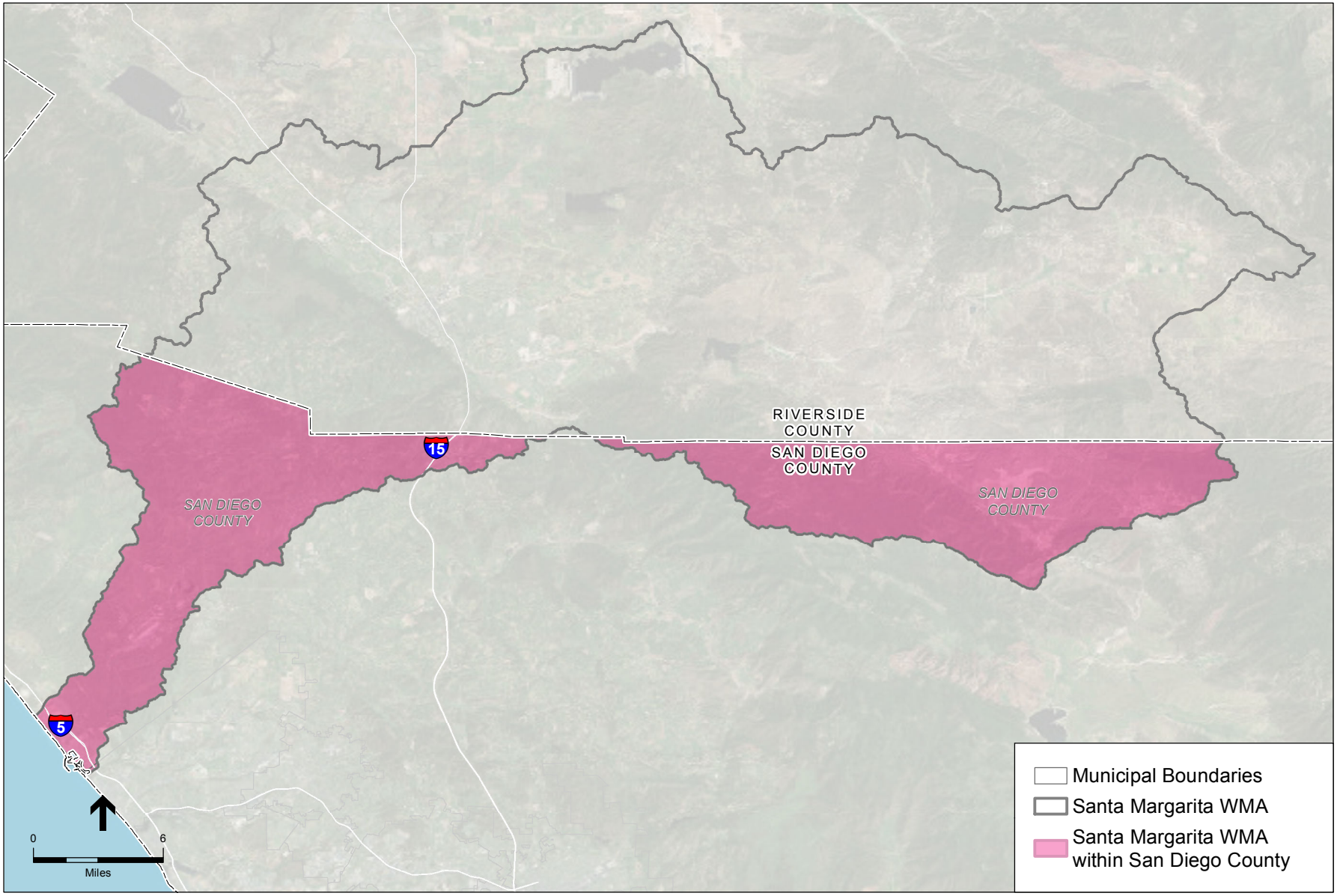
The Tijuana River WMA provides critical habitat for nine species, including Least Bell's vireo, Otay tarplant, San Diego fairy shrimp, Spreading navarretia, Quino checkerspot butterfly, Arroyo Southwestern Toad, Laguna Mountains Skipper, Riverside Fairy shrimp, and Western snowy plover. These critical habitats are shown in Figure 3-55.

3.9.6 Watershed Processes

The Tijuana Watershed has various environmental problems impacting both sides of the international border. Pollution impacts public health, the environment, and the economy of San Diego-Tijuana border communities.

Unplanned development, industry, and population growth in Tijuana has led to an increase in water quality issues, especially since many new developments in Mexico near the Tijuana River have no sewer infrastructure. Additionally, Mexico does not have a federal program like the USEPA's NPDES program to minimize the threat of pollutants entering waterways.

The Department of Homeland Security has allowed for construction projects under the U.S. Border Fence program to be exempt from environmental regulations which could degrade habitat and water quality in the Tijuana Watershed. The border fence itself is also considered a significant hydromodification that impacts hydrology and natural hydrologic flows.

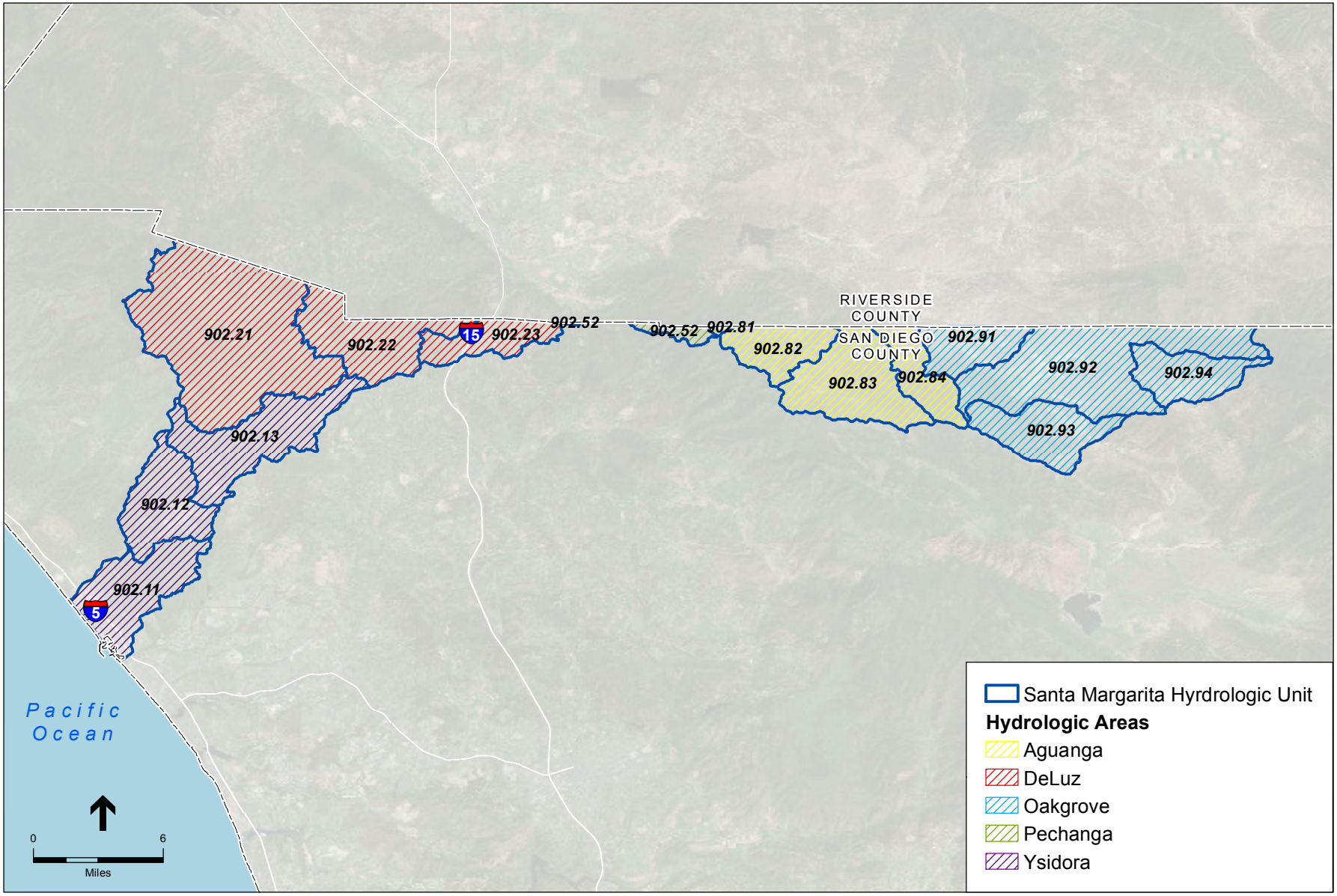


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-2

City Boundaries within the Santa Margarita Water Management Area

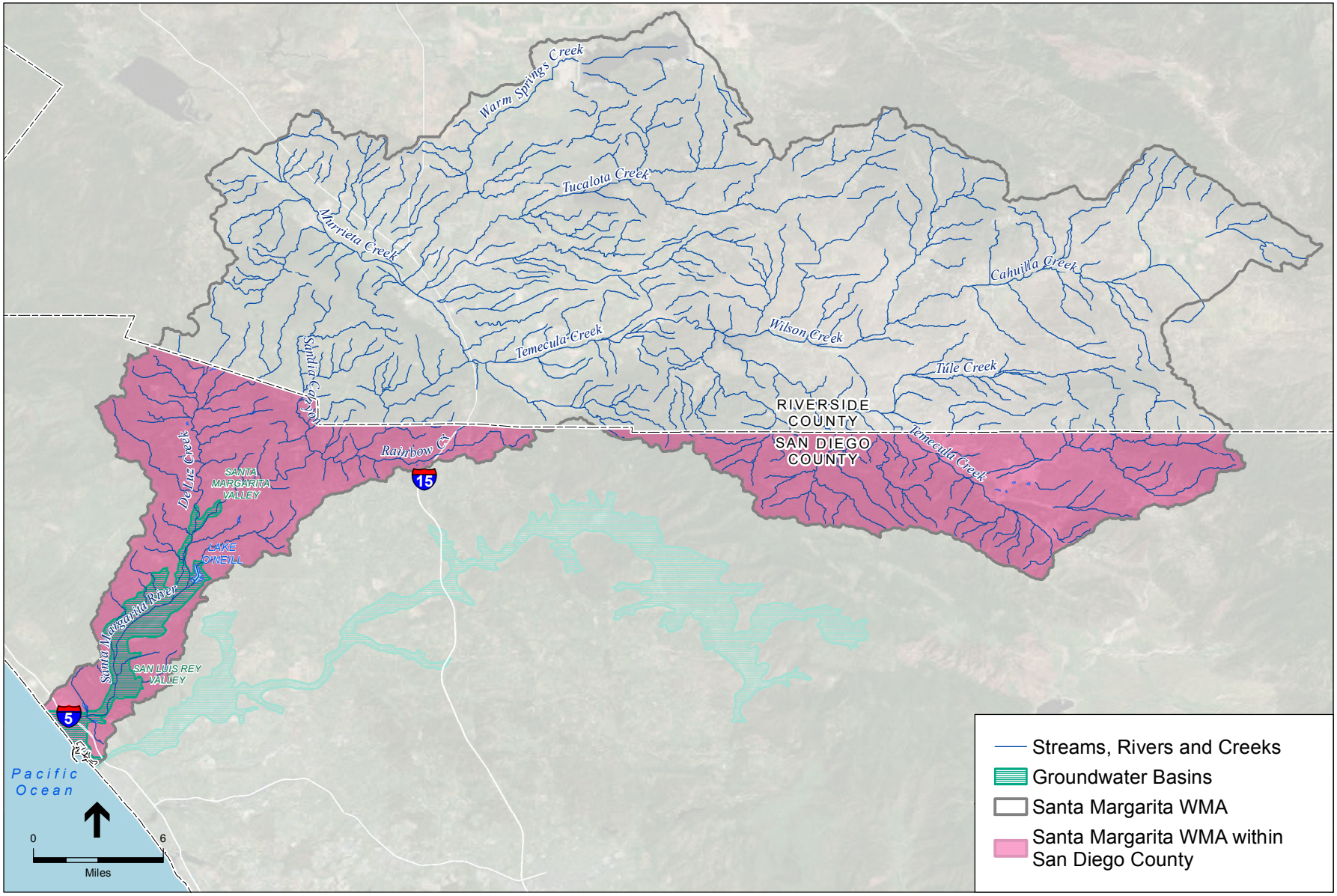


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-3

Hydrologic Units and Areas within the Santa Margarita Water Management Area

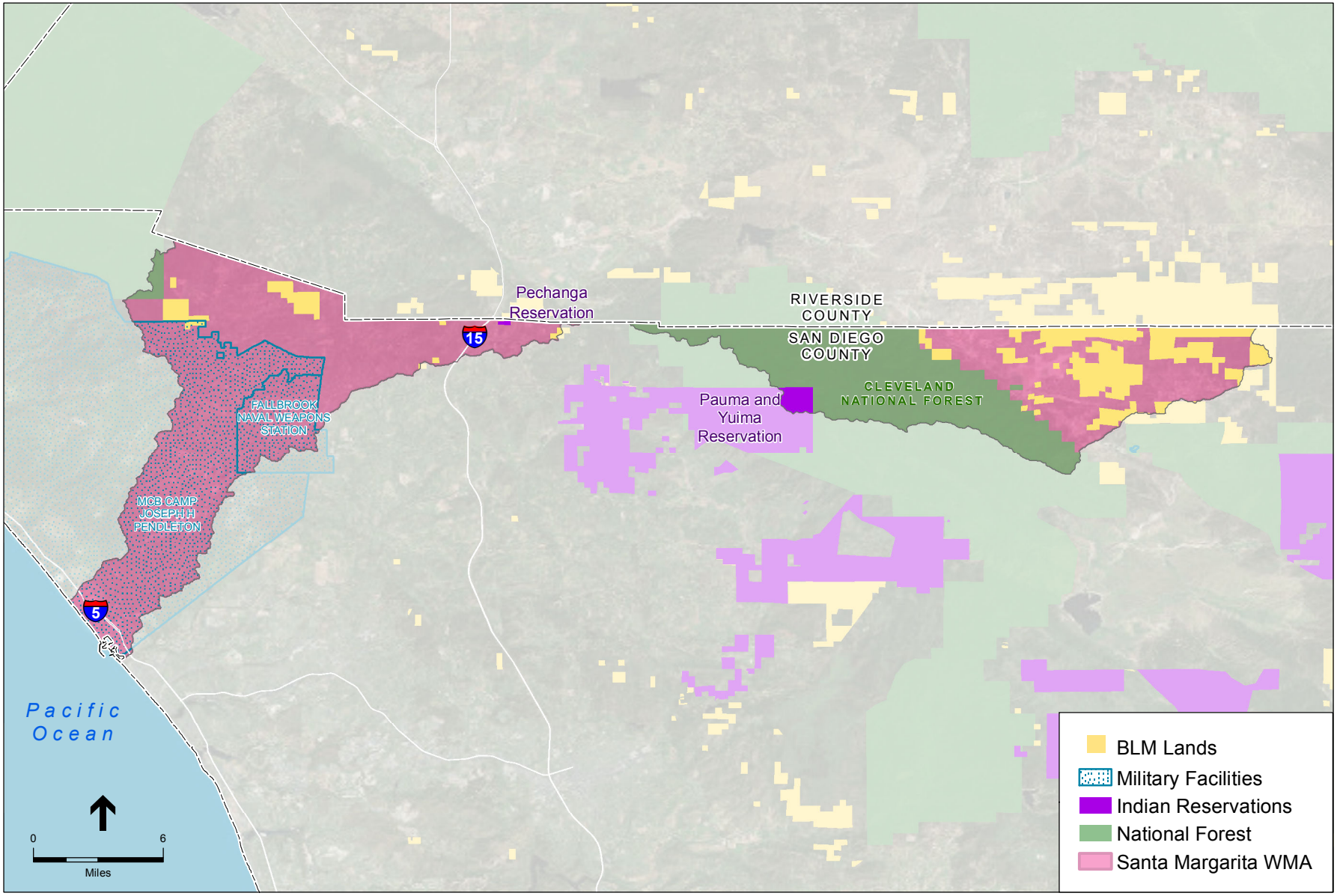


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-4

Water Features within the Santa Margarita Water Management Area

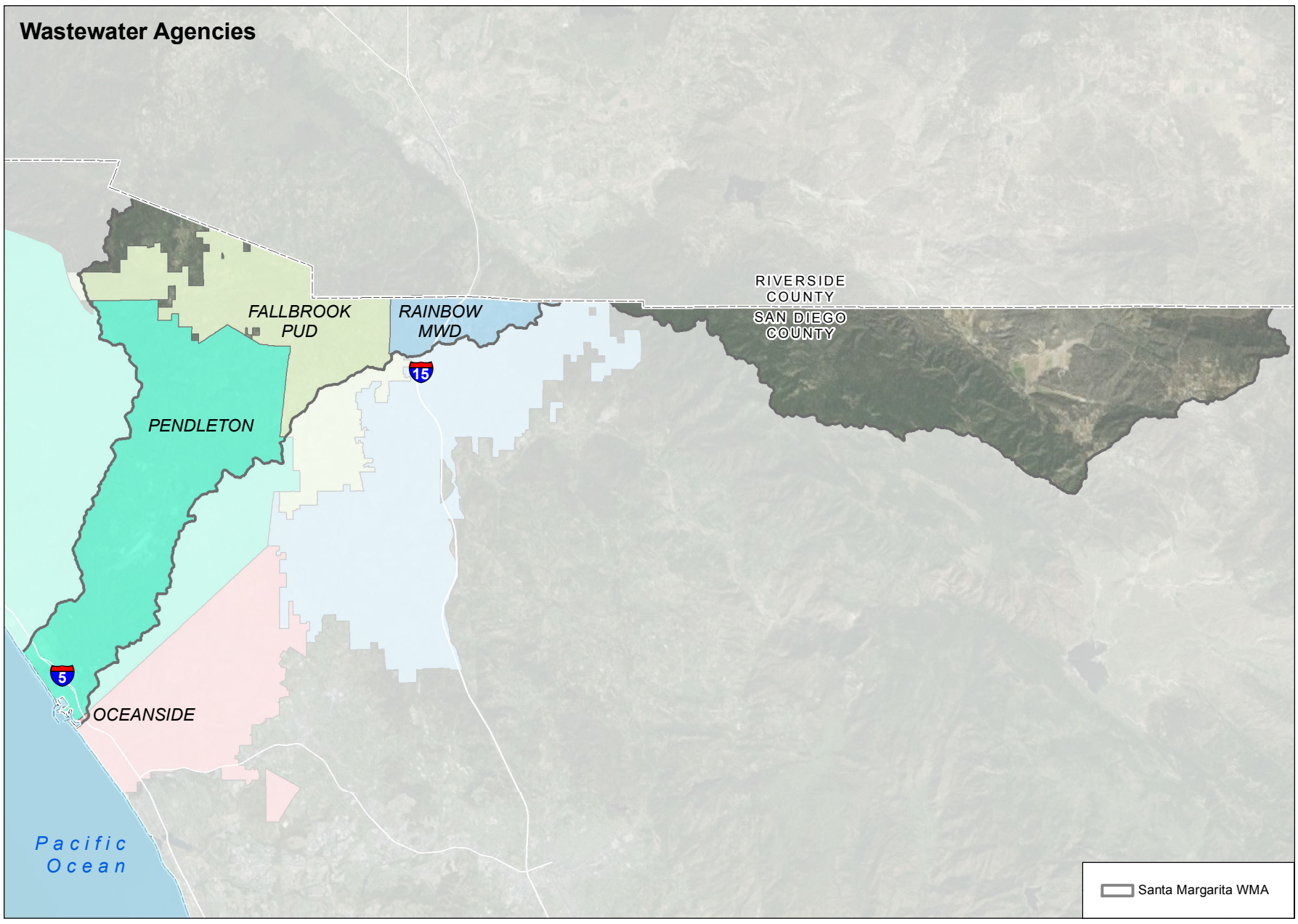


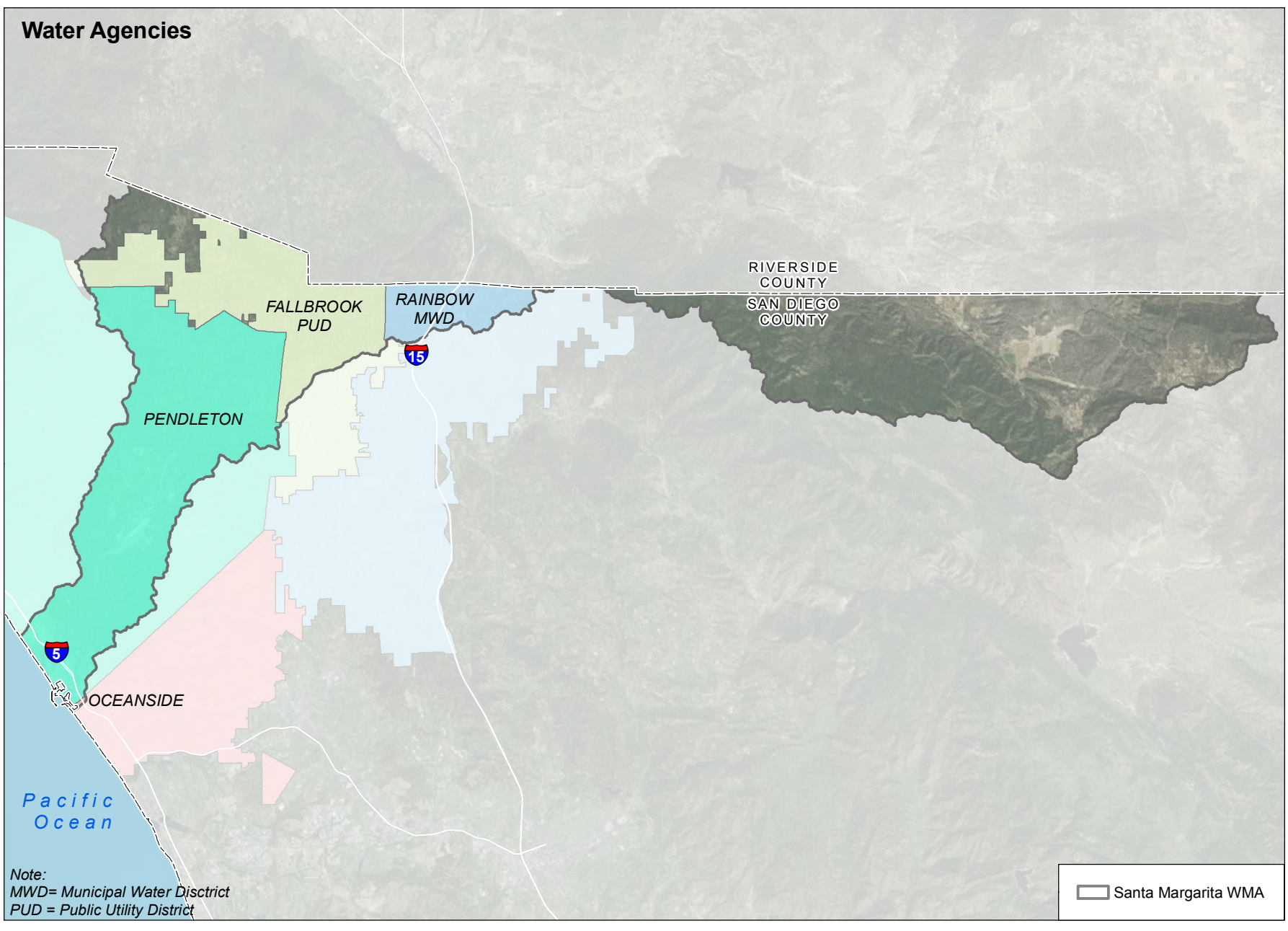
SOURCE: ESRI, 2016; SanGIS, 2016; Bureau of Land Management

SWRP . 160618

Figure 3-5

Land Use Agencies within the Santa Margarita Water Management Area



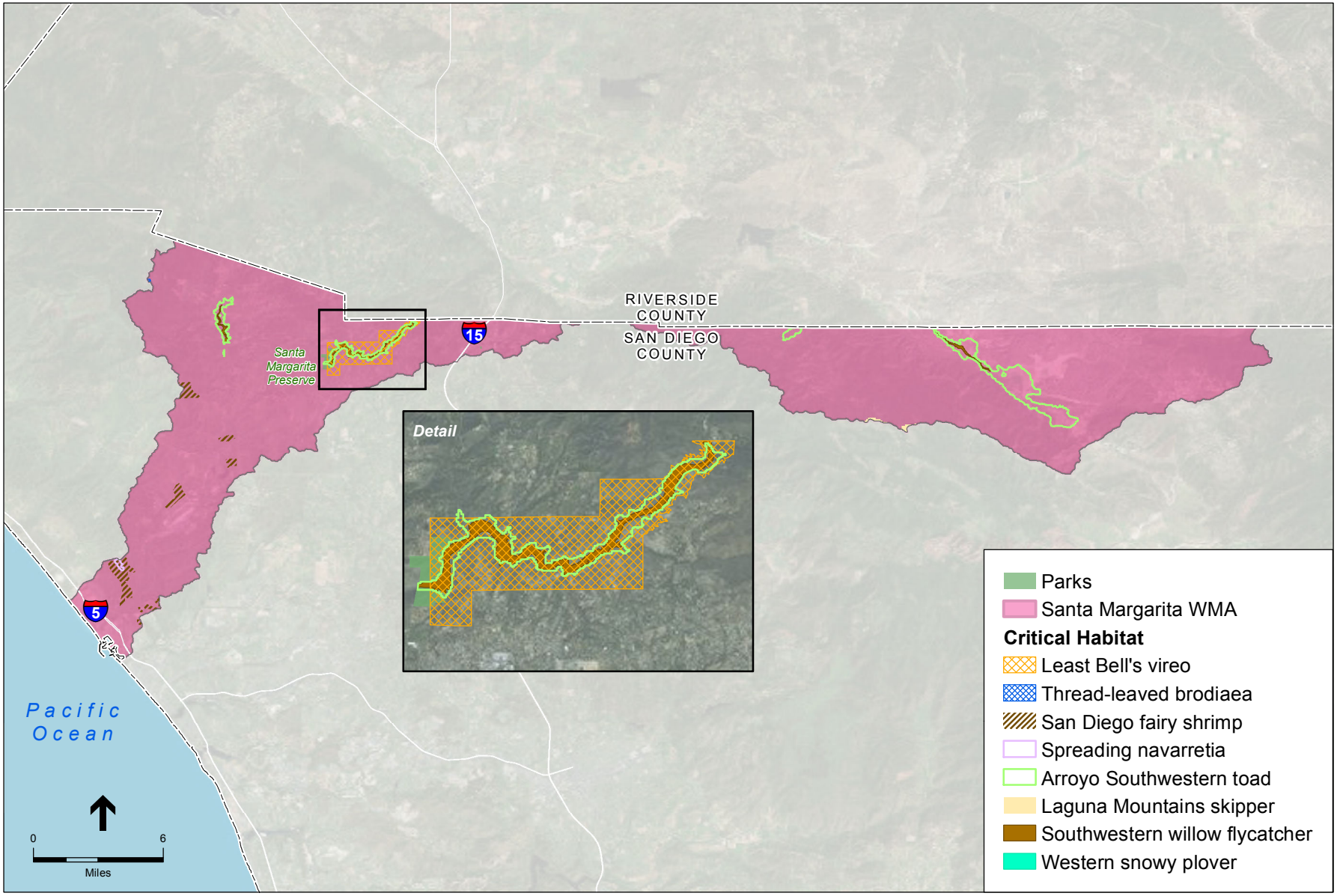


SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

SWRP . 160618

Figure 3-6

Water Agencies and Wastewater Agencies
within the Santa Margarita Water Management Area

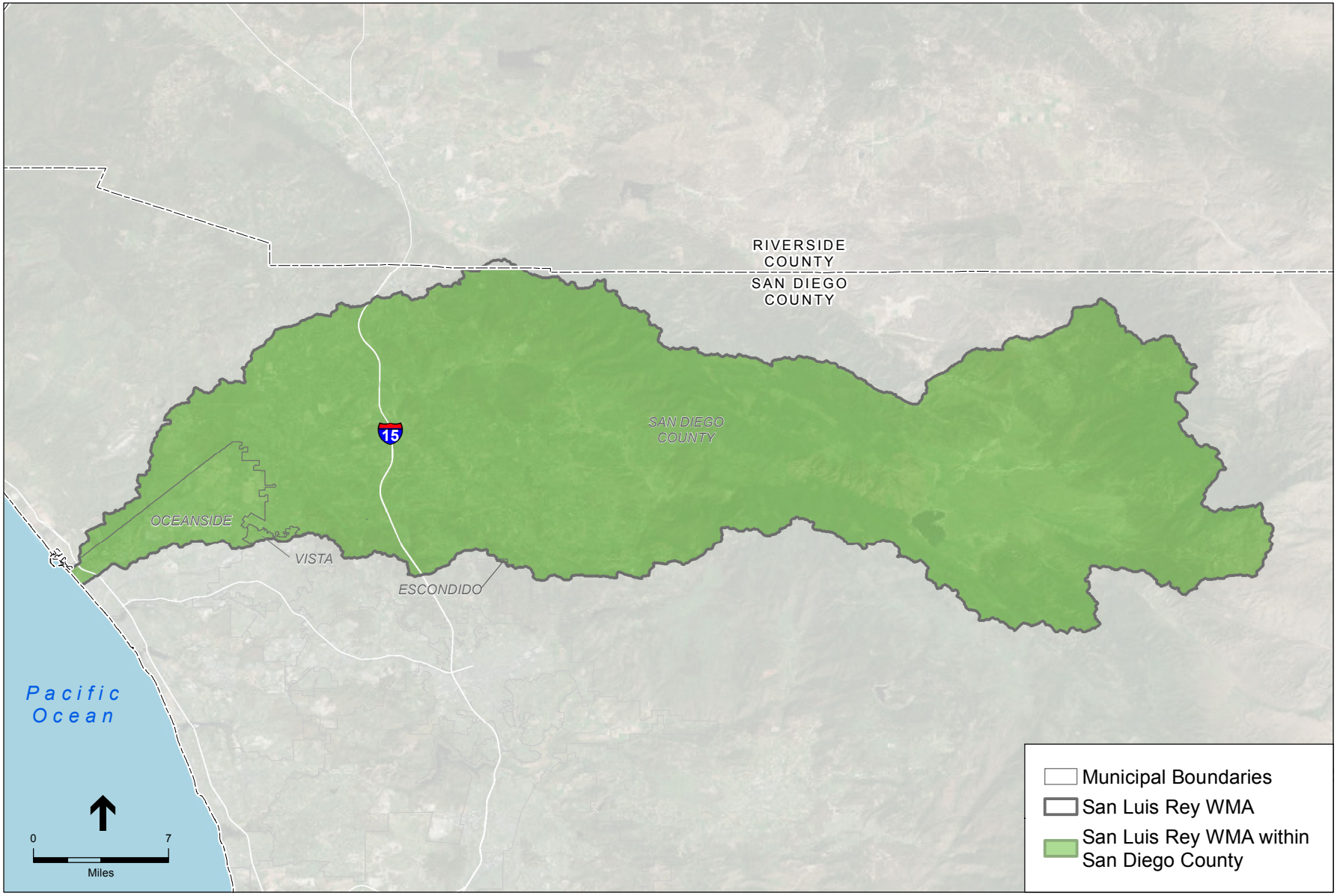


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-7

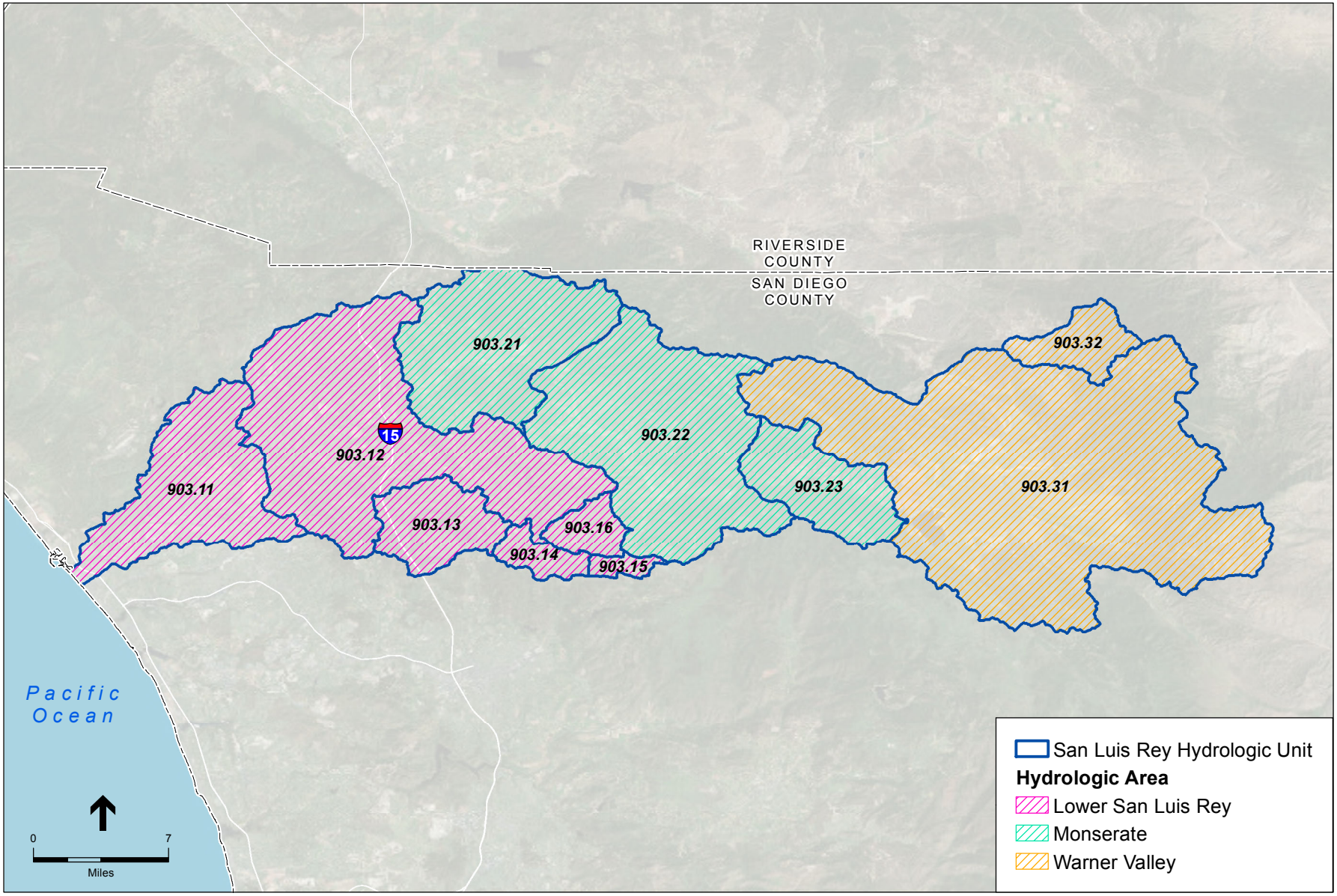
Critical Habitat within the Santa Margarita Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-8
City Boundaries within the San Luis Rey Water Management Area

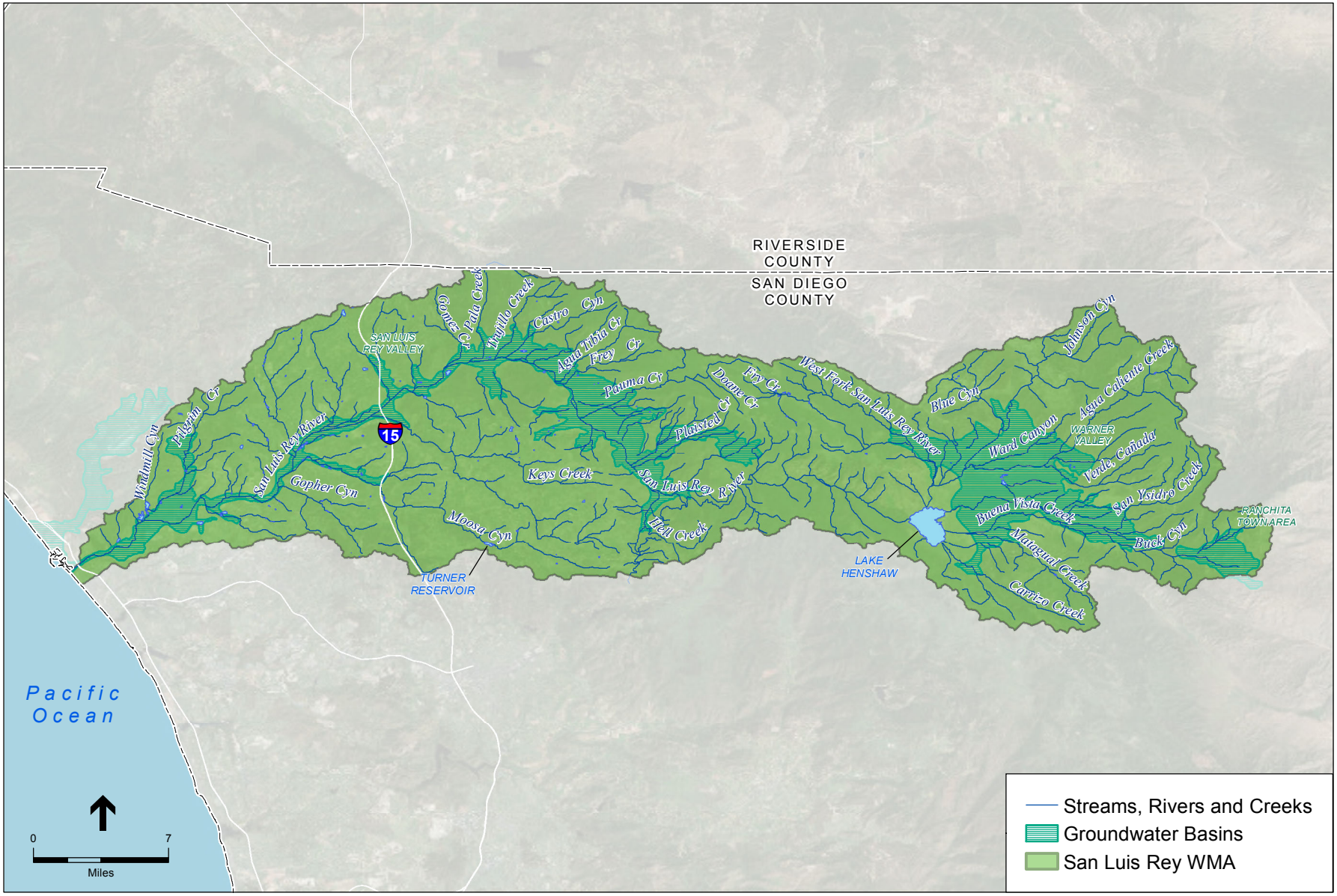


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-9

Hydrologic Units and Areas within the San Luis Rey Water Management Area

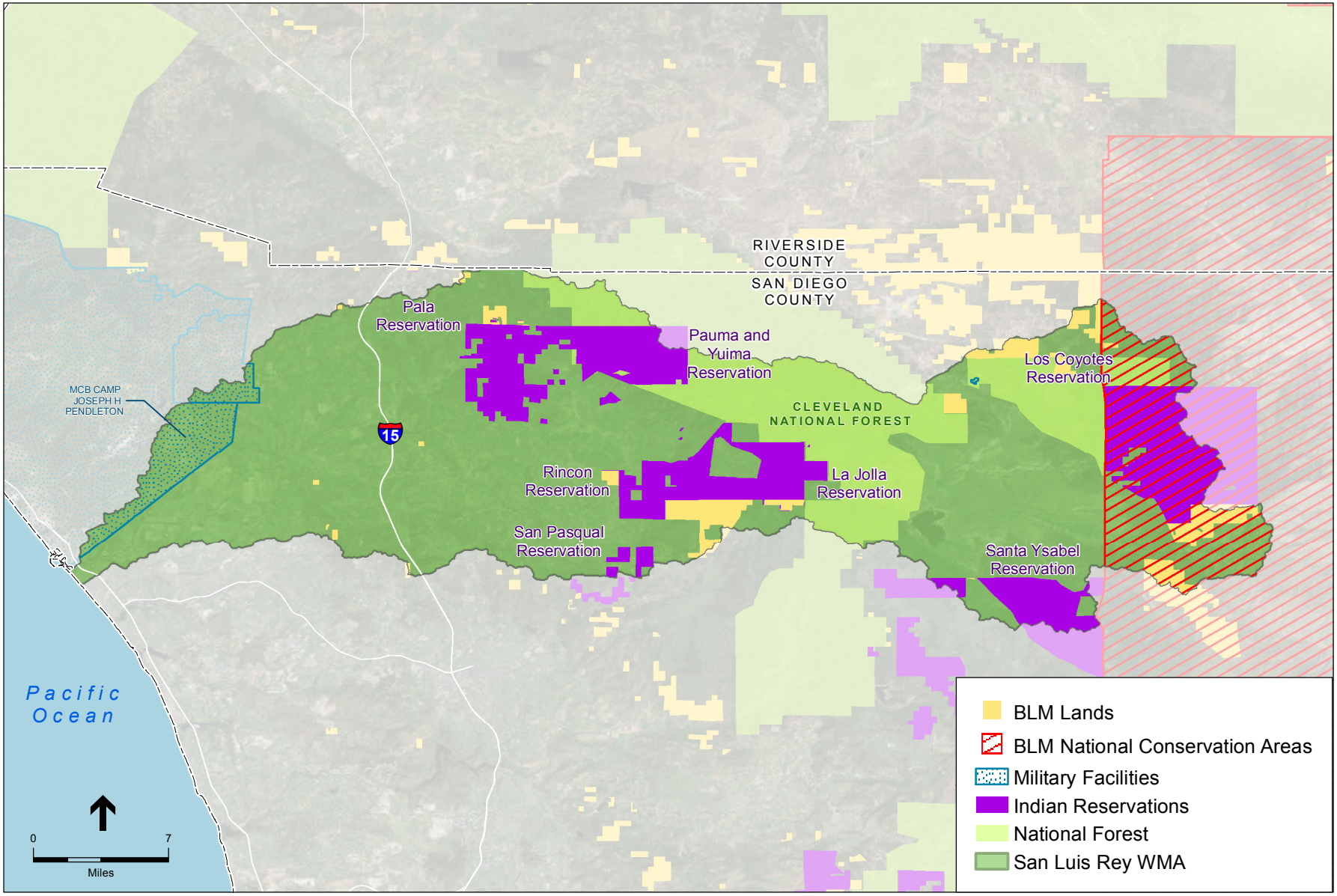


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-10

Water Features within the San Luis Rey Water Management Area

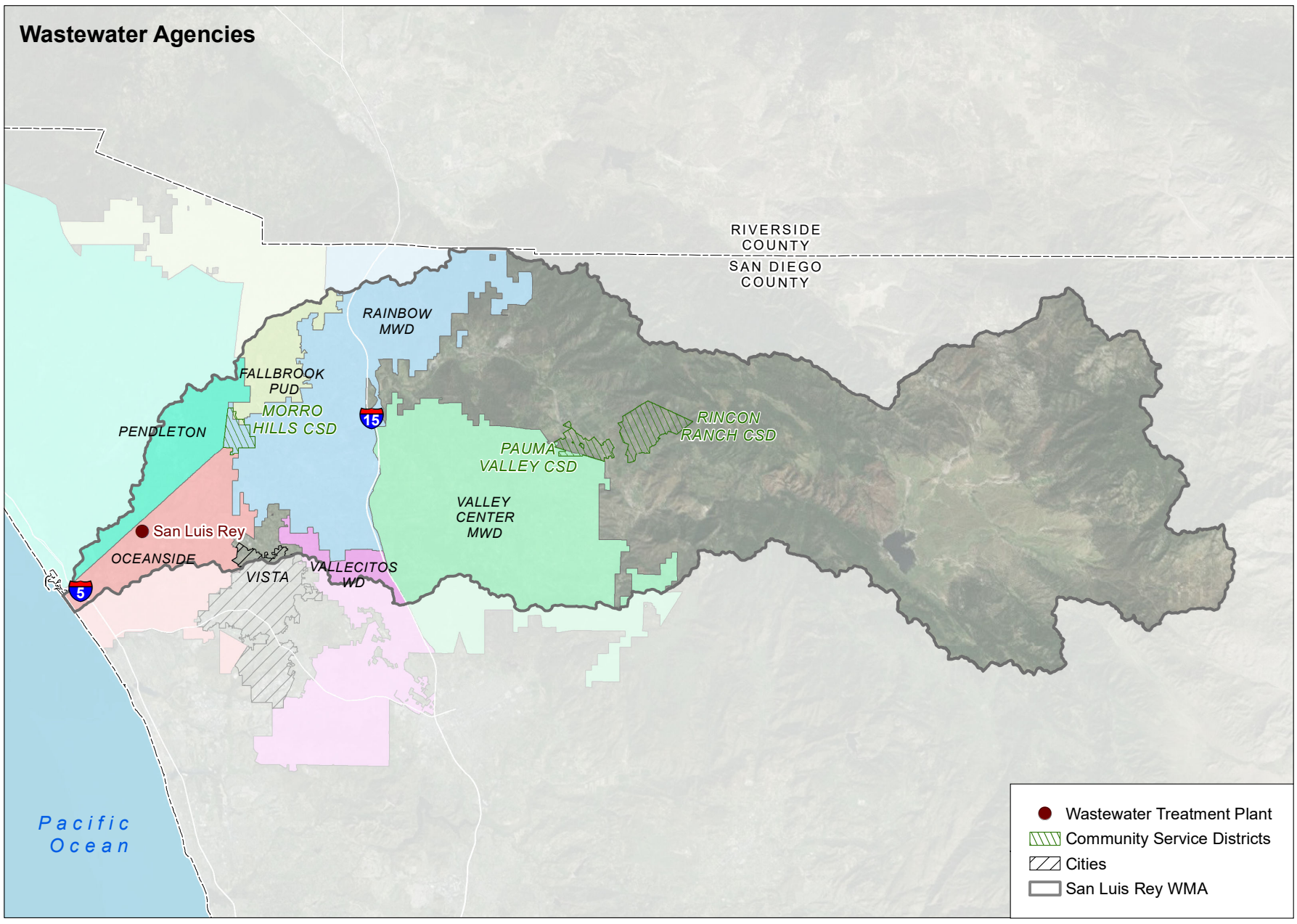


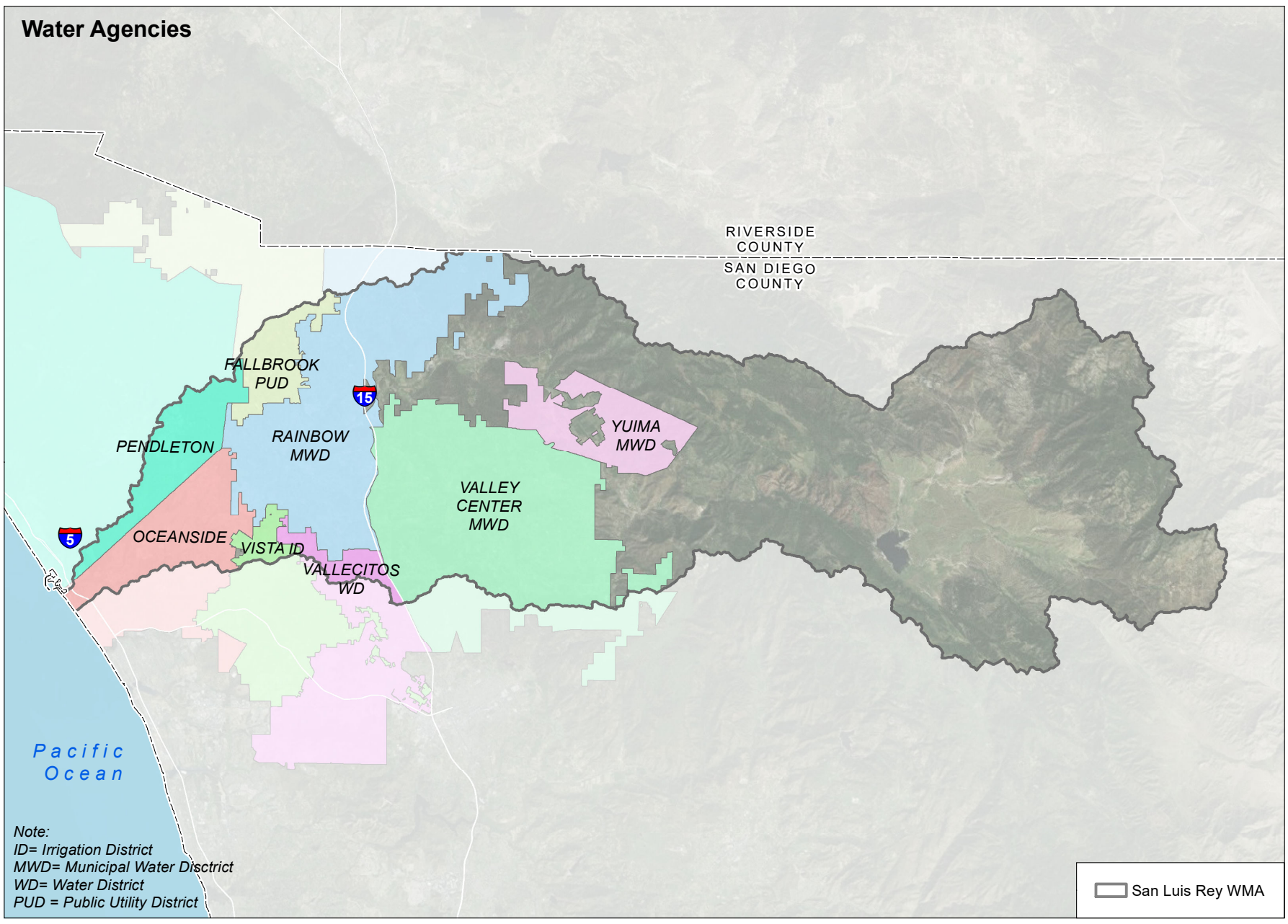
SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-11

Land Use Agencies within the San Luis Rey Water Management Area





SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

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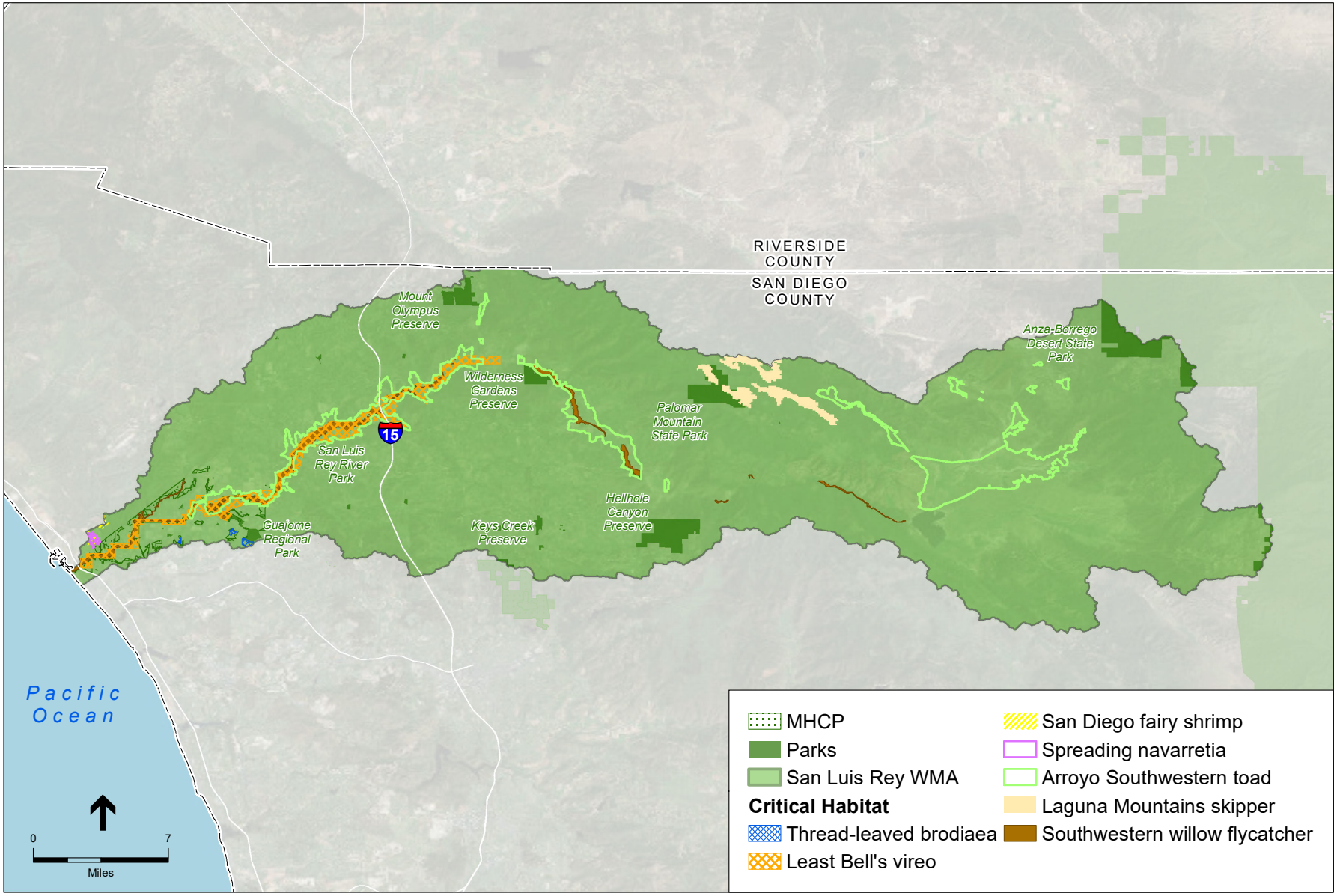
Figure 3-12

Water Agencies and Wastewater Agencies within the San Luis Rey Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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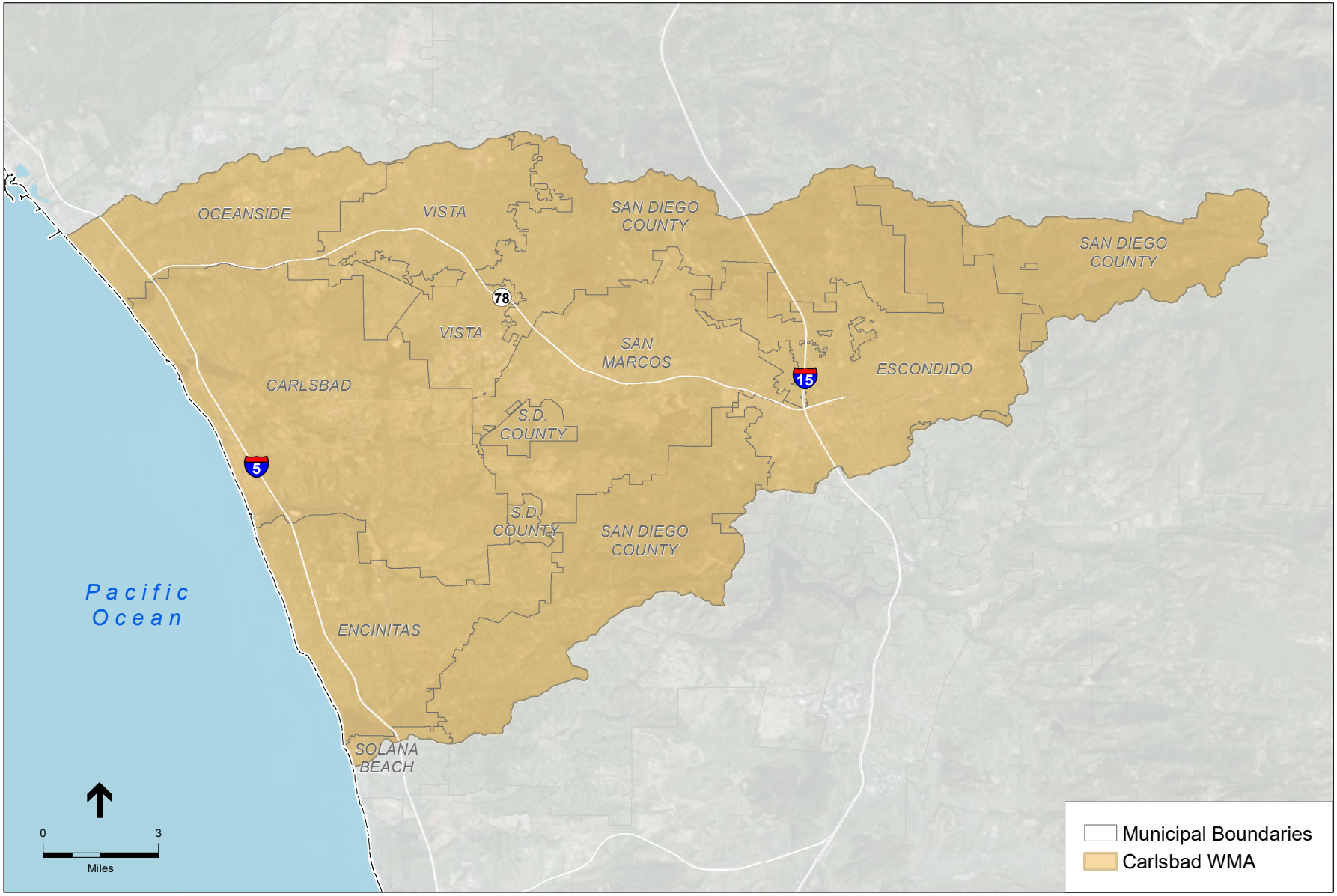
Figure 3-13

Critical Habitat within the San Luis Rey Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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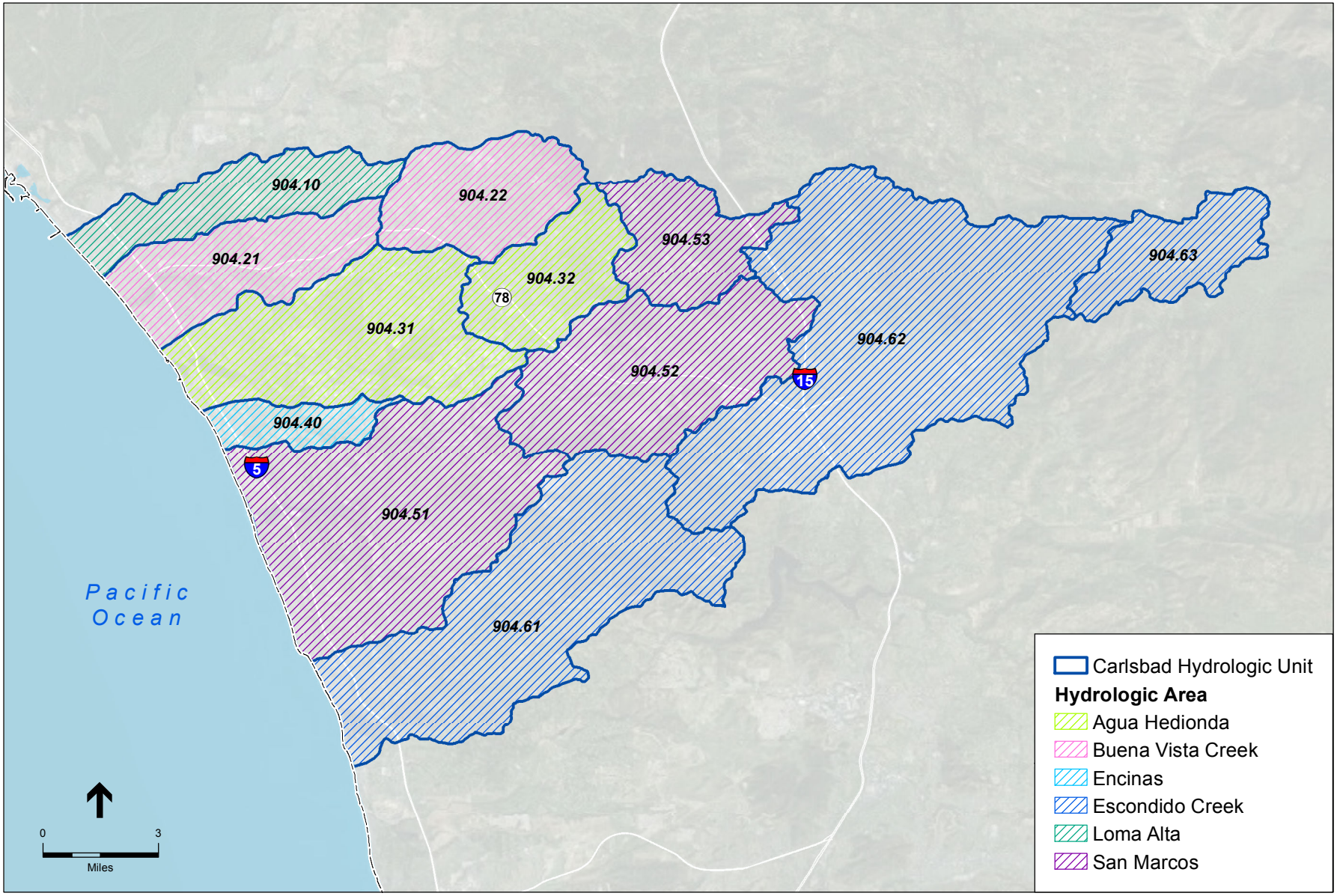
Figure 3-14

City Boundaries within the Carlsbad Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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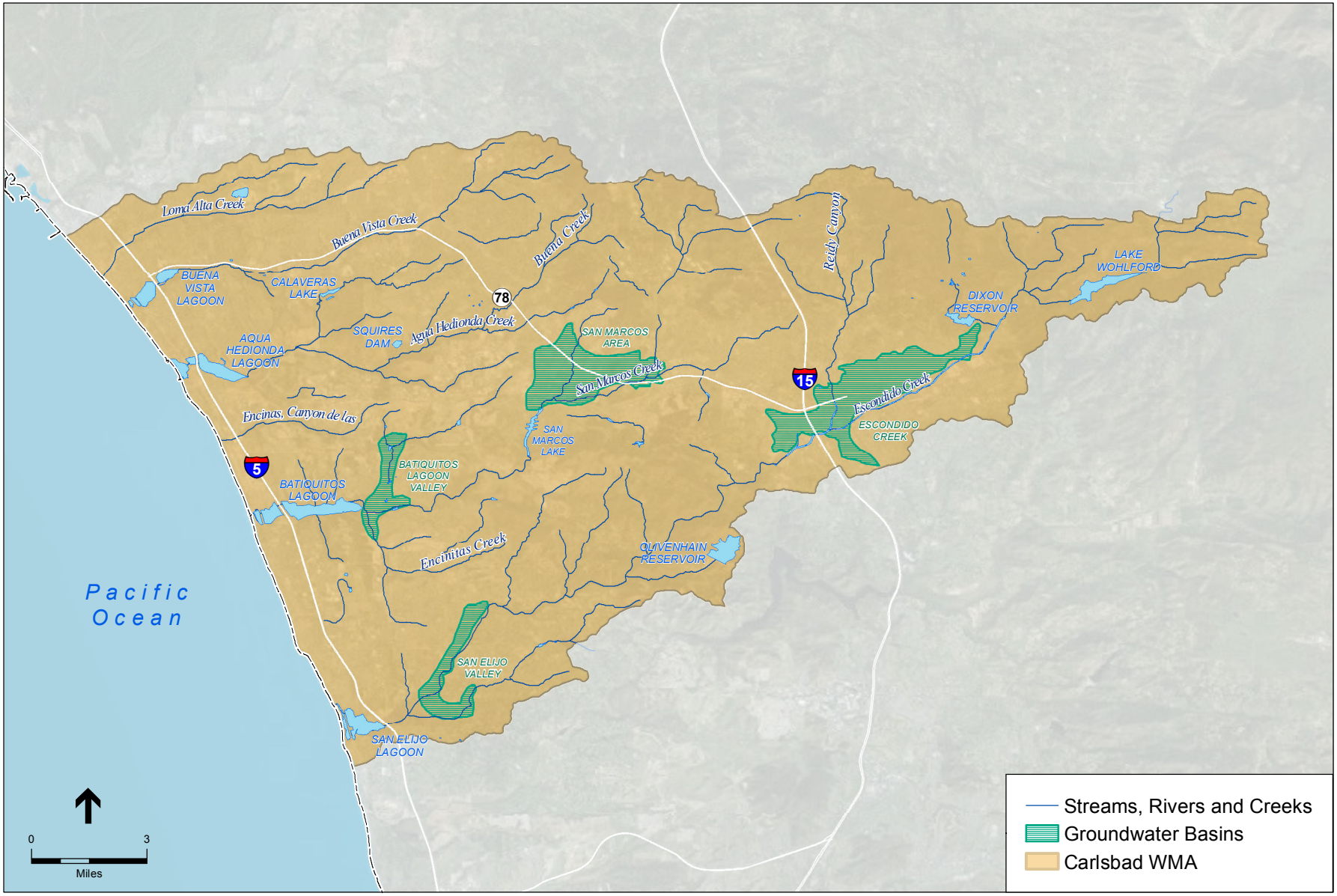
Figure 3-15

Hydrologic Units and Area within the Carlsbad Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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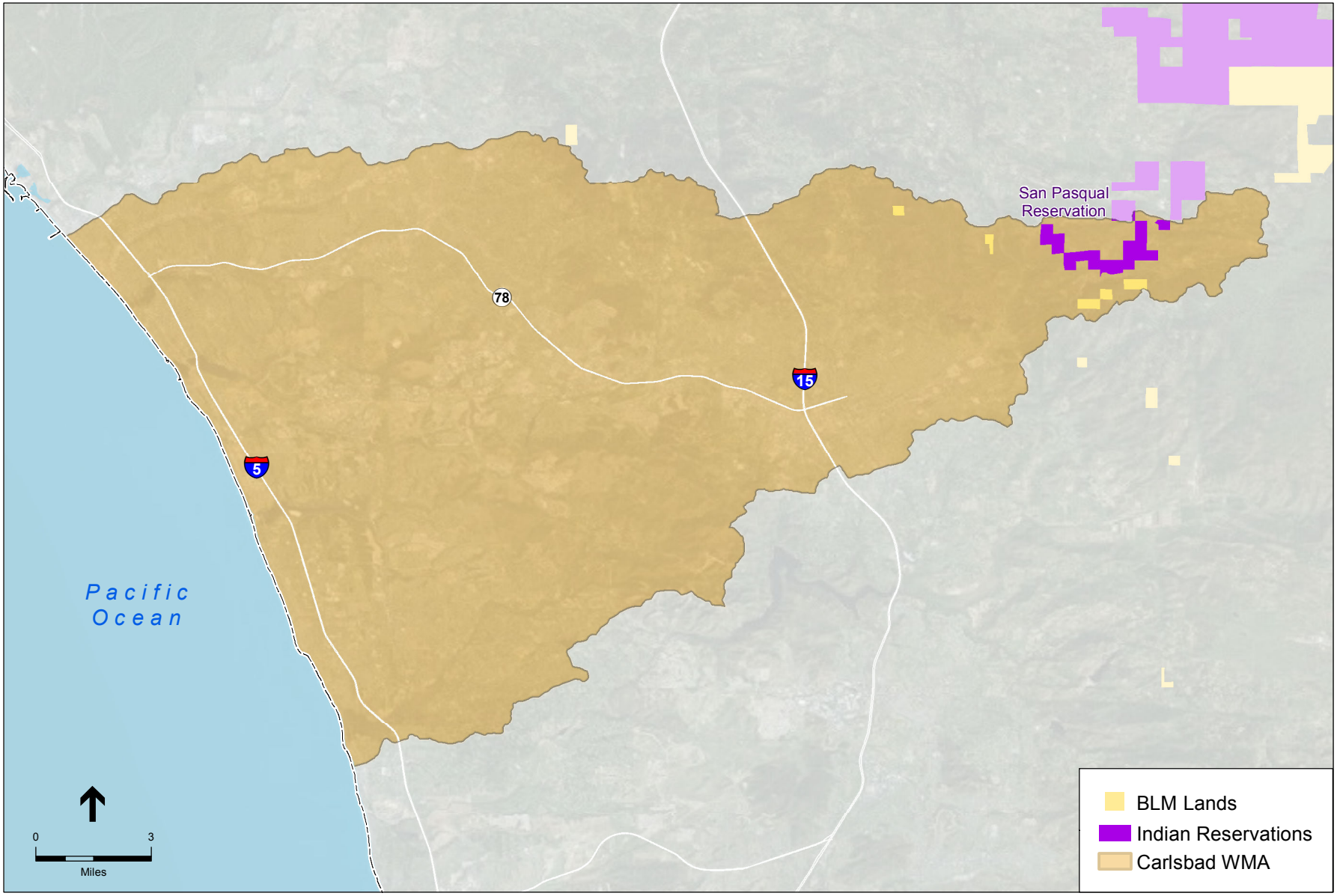
Figure 3-16

Water Features within the Carlsbad Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016; Bureau of Land Management

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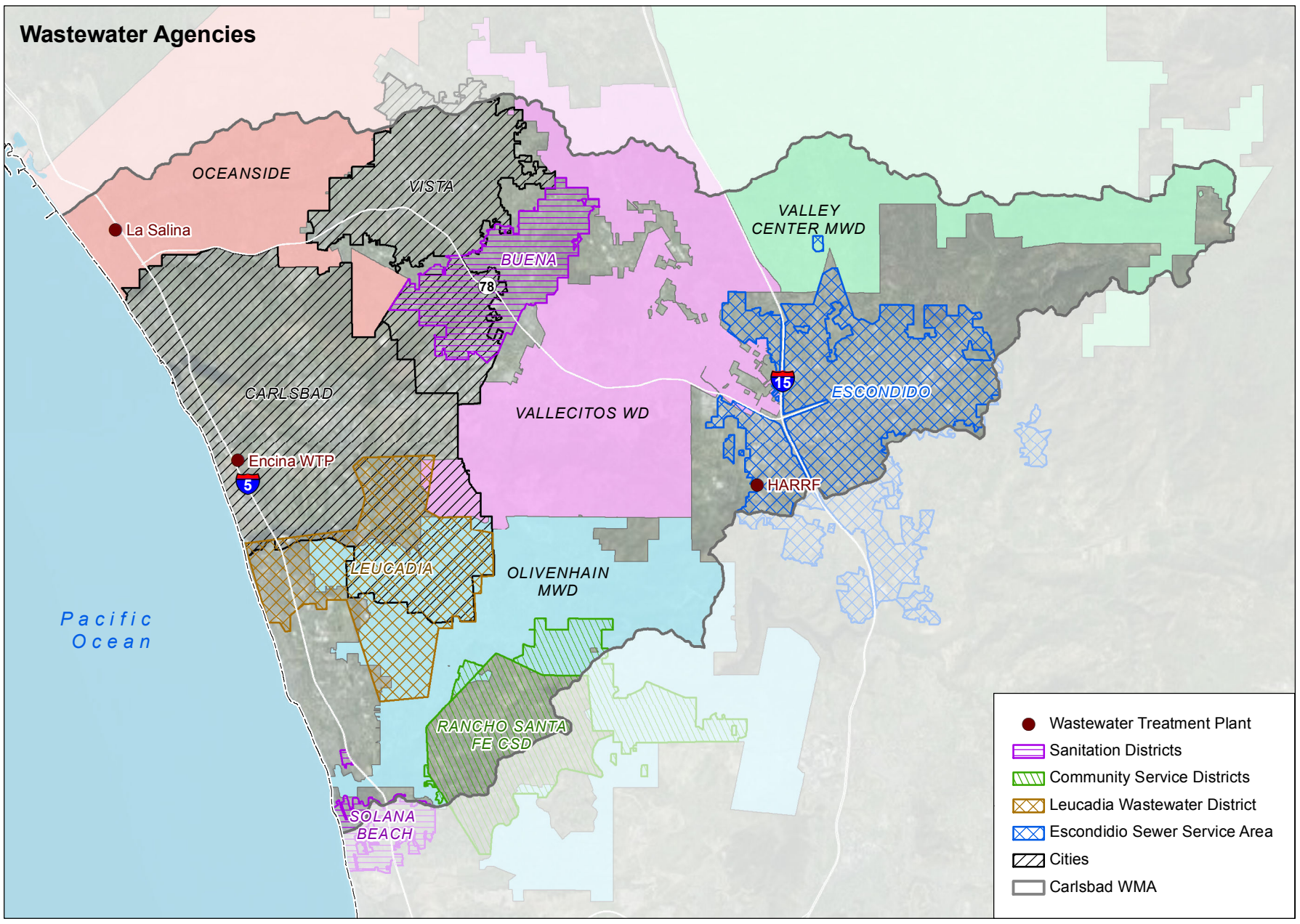
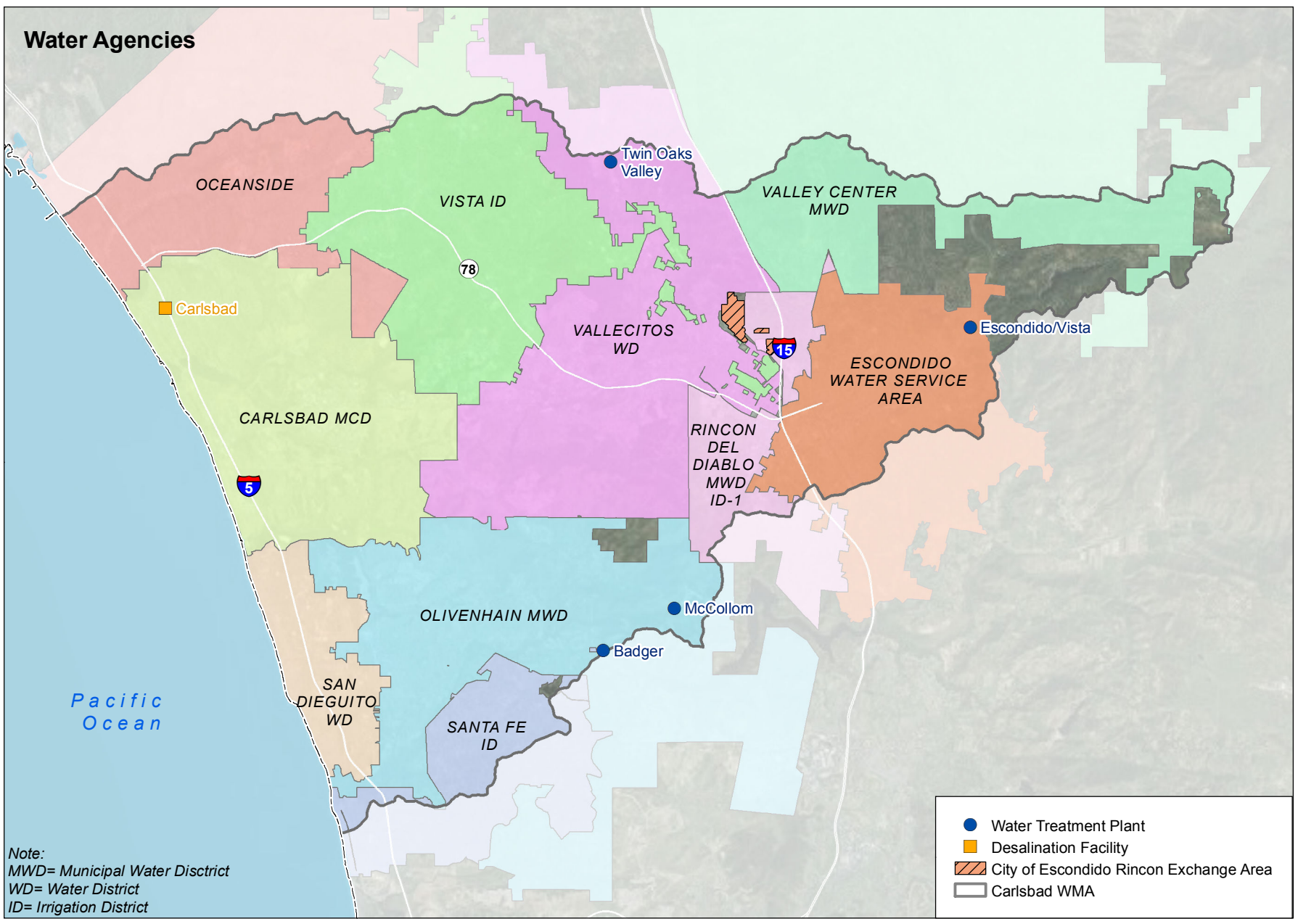
Figure 3-17
Land Use Agencies within the
Carlsbad Water Management Area





SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

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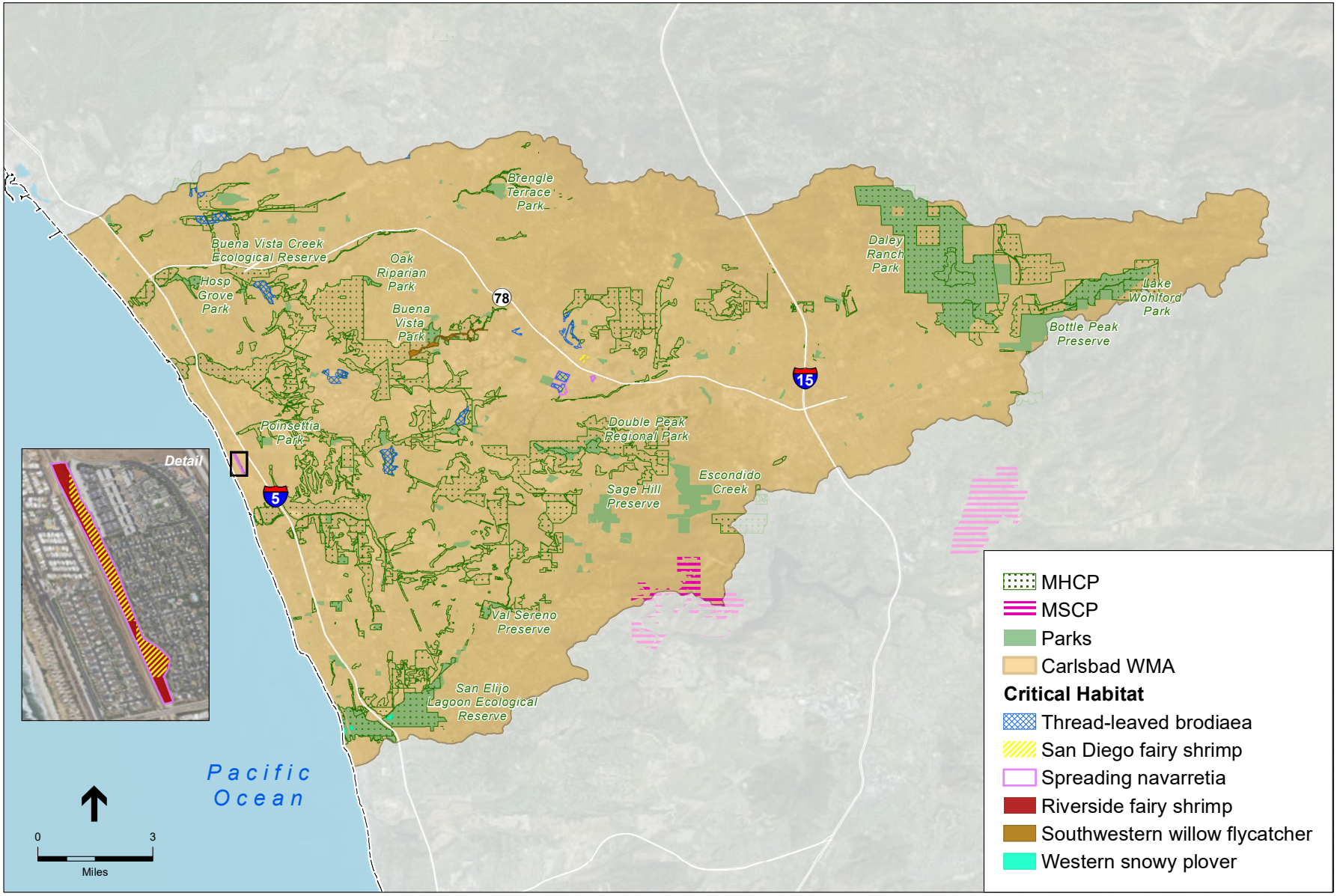
Figure 3-18

Water Agencies and Wastewater Agencies within the Carlsbad Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016; USFWS

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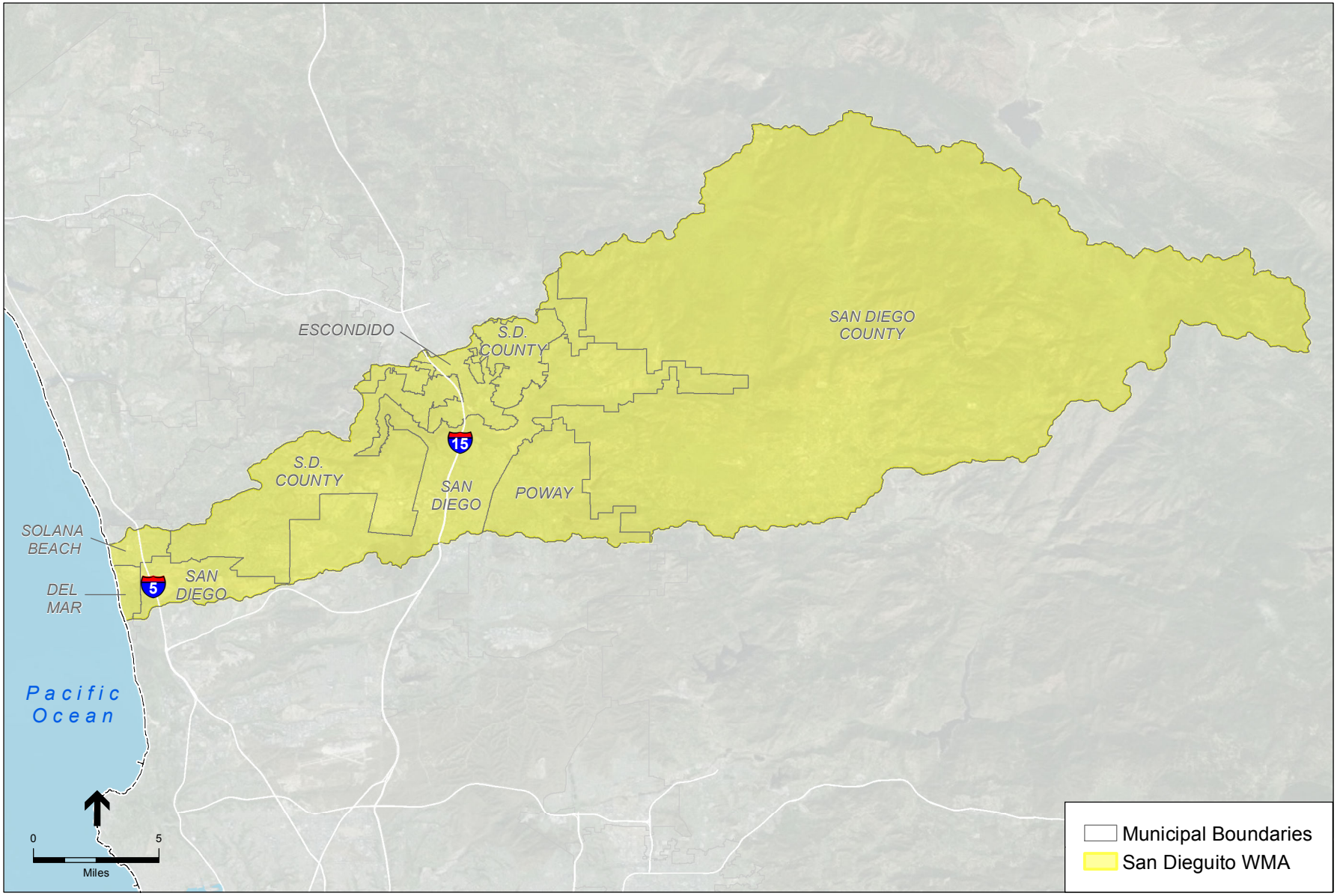
Figure 3-19

Critical Habitat within the Carlsbad Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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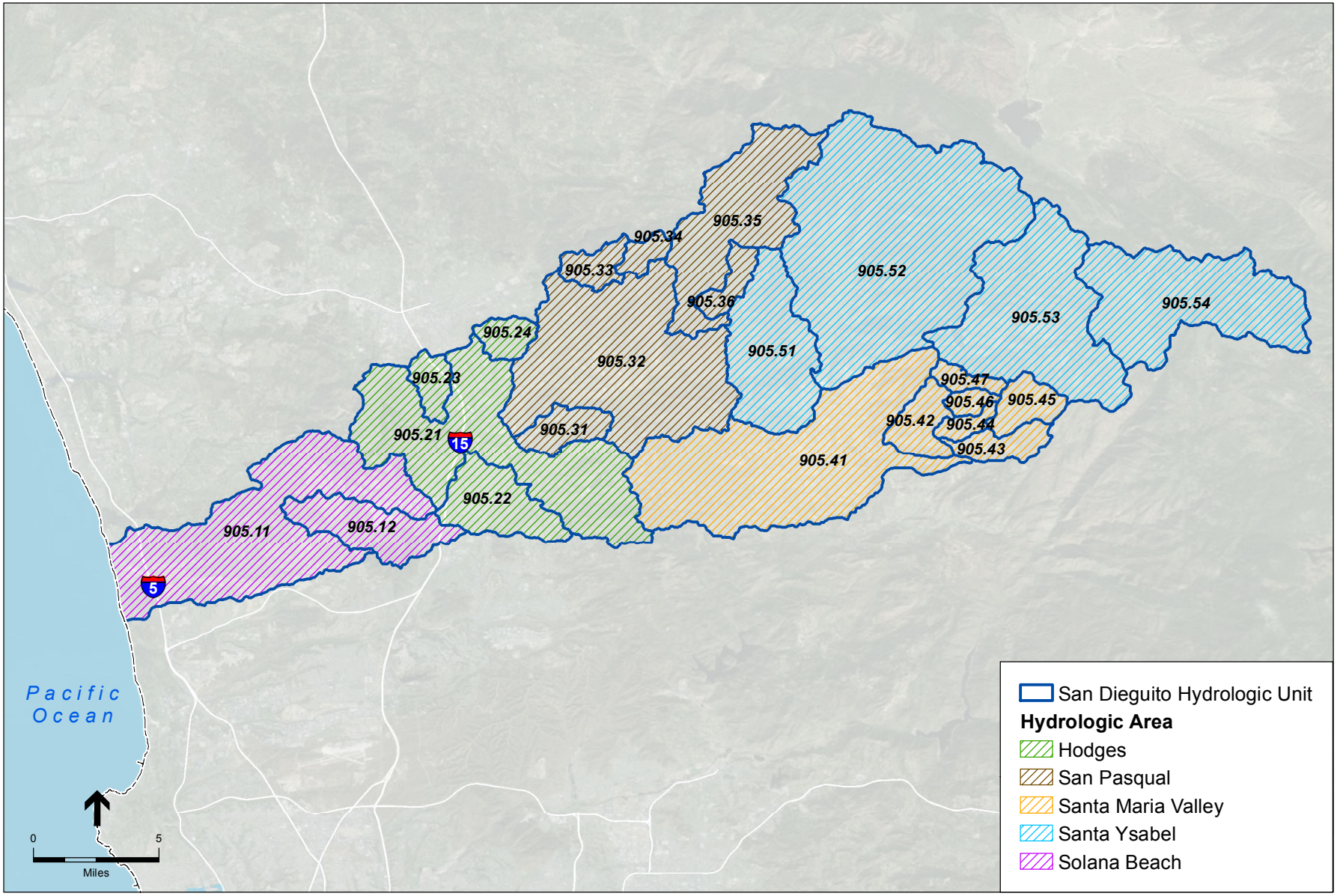
Figure 3-20
City Boundaries within the San Dieguito Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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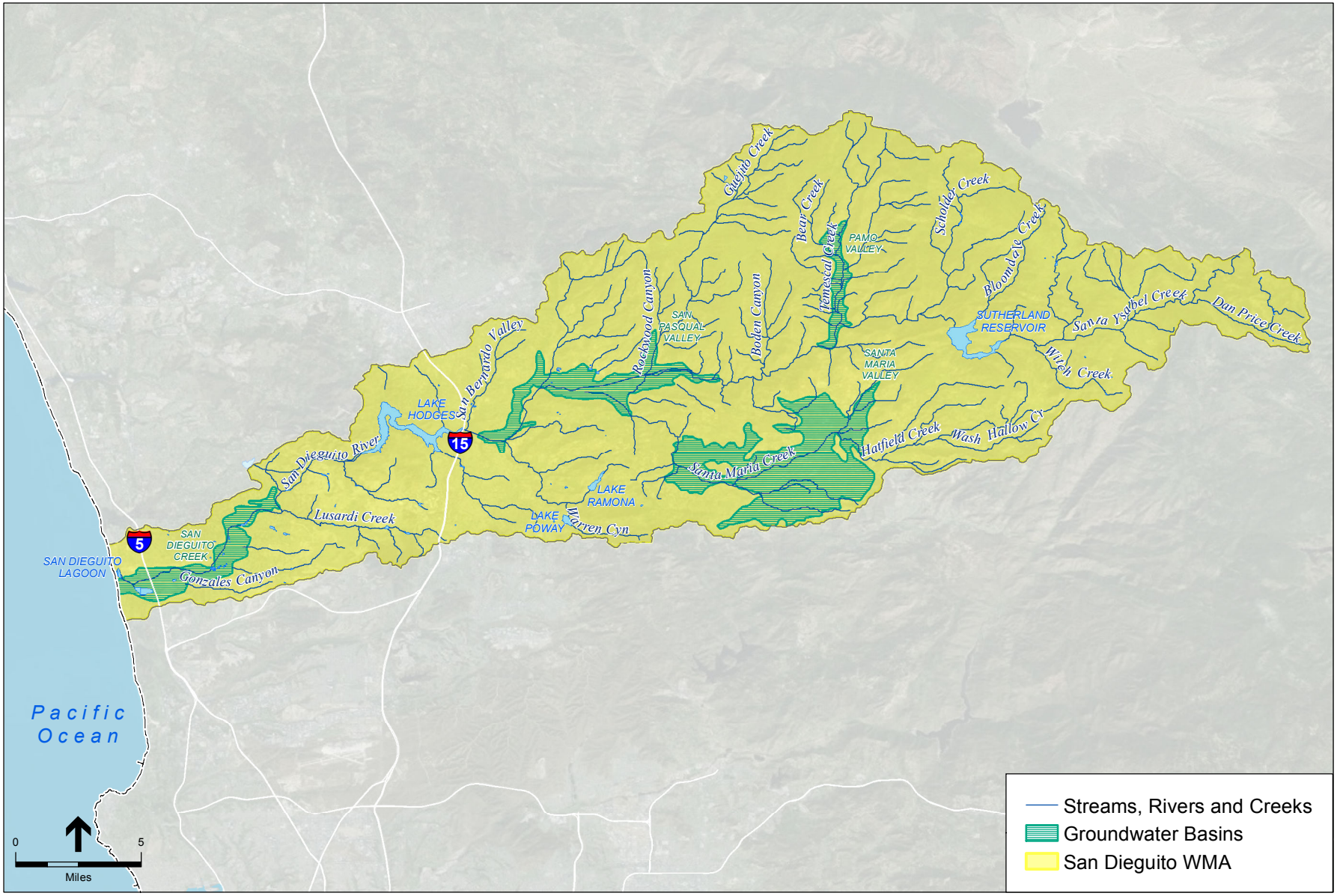
Figure 3-21

Hydrologic Units and Areas within the San Dieguito Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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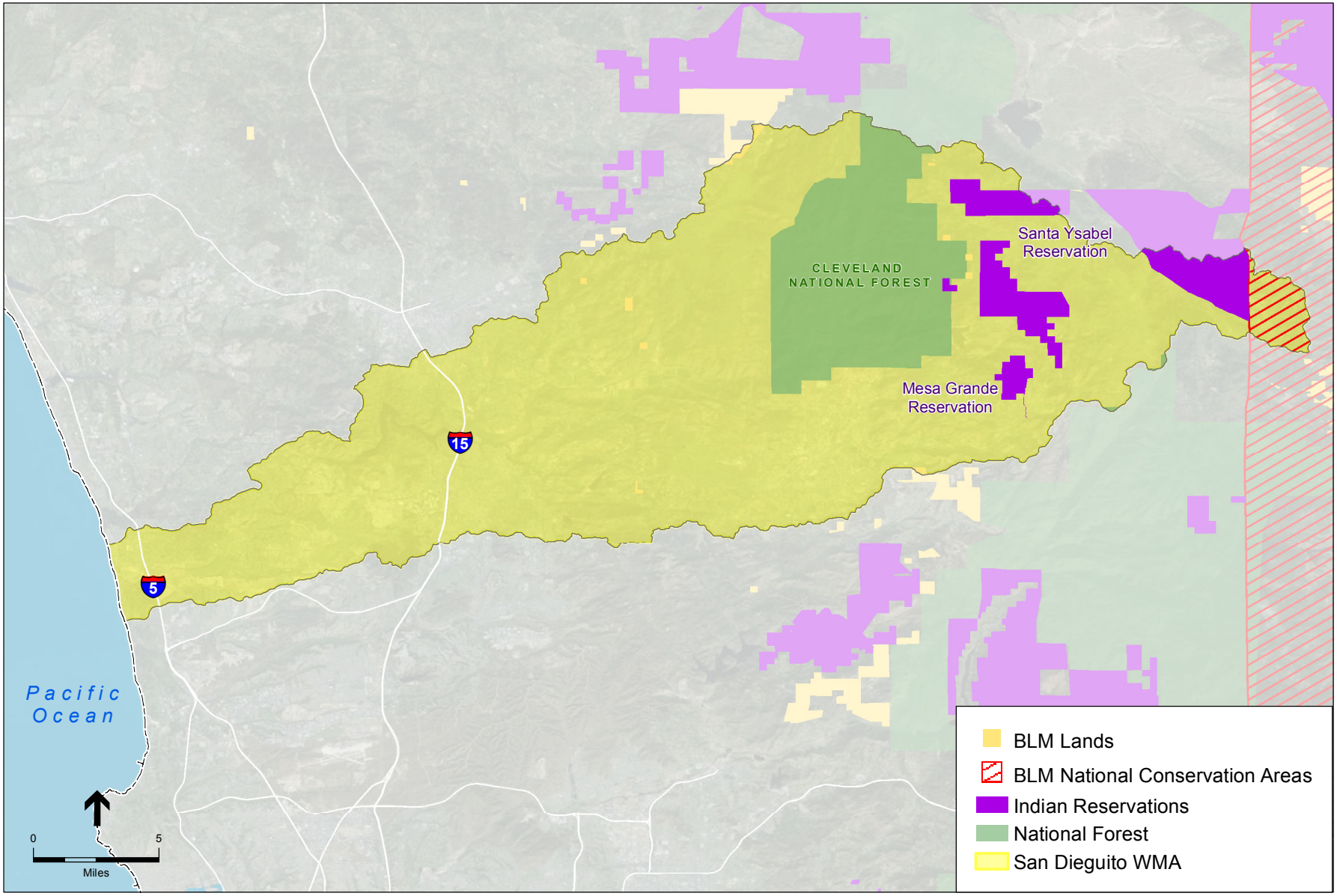
Figure 3-22

Water Features within the San Dieguito Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016; Bureau of Land Management

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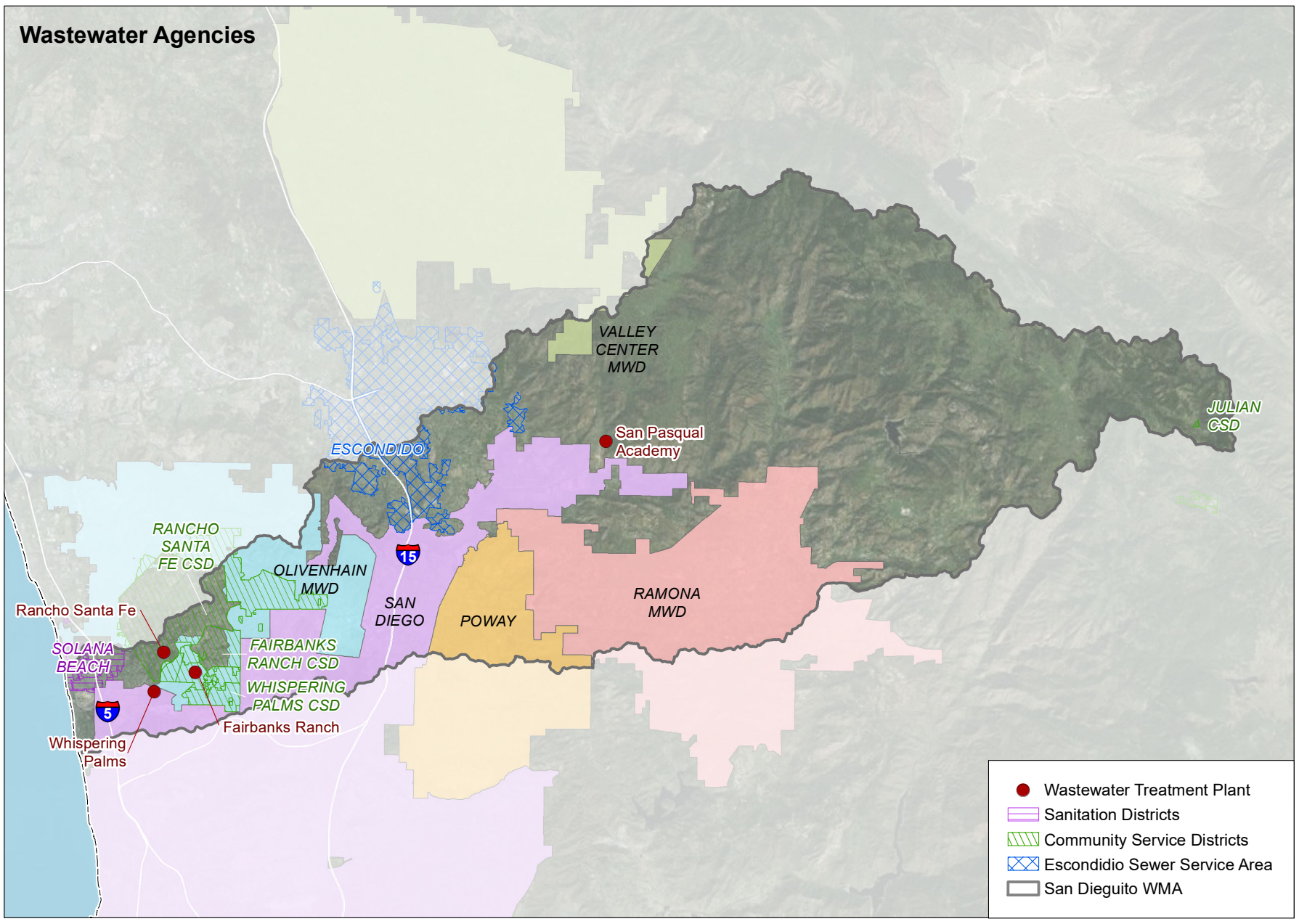
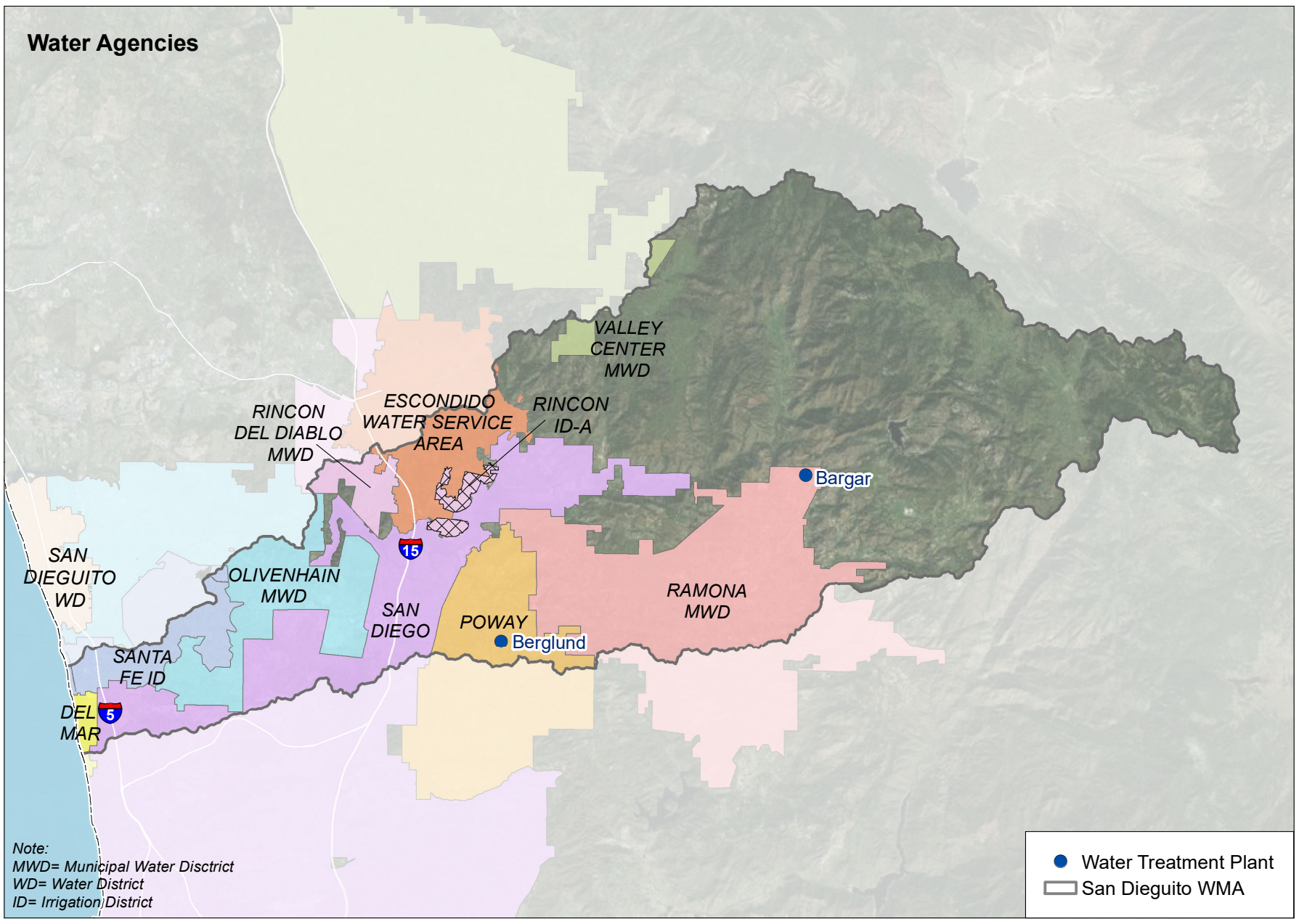
Figure 3-23

Land Use Agencies within the San Dieguito Water Management Area





SOURCE: ESRI, 2016; SanGIS, 2016

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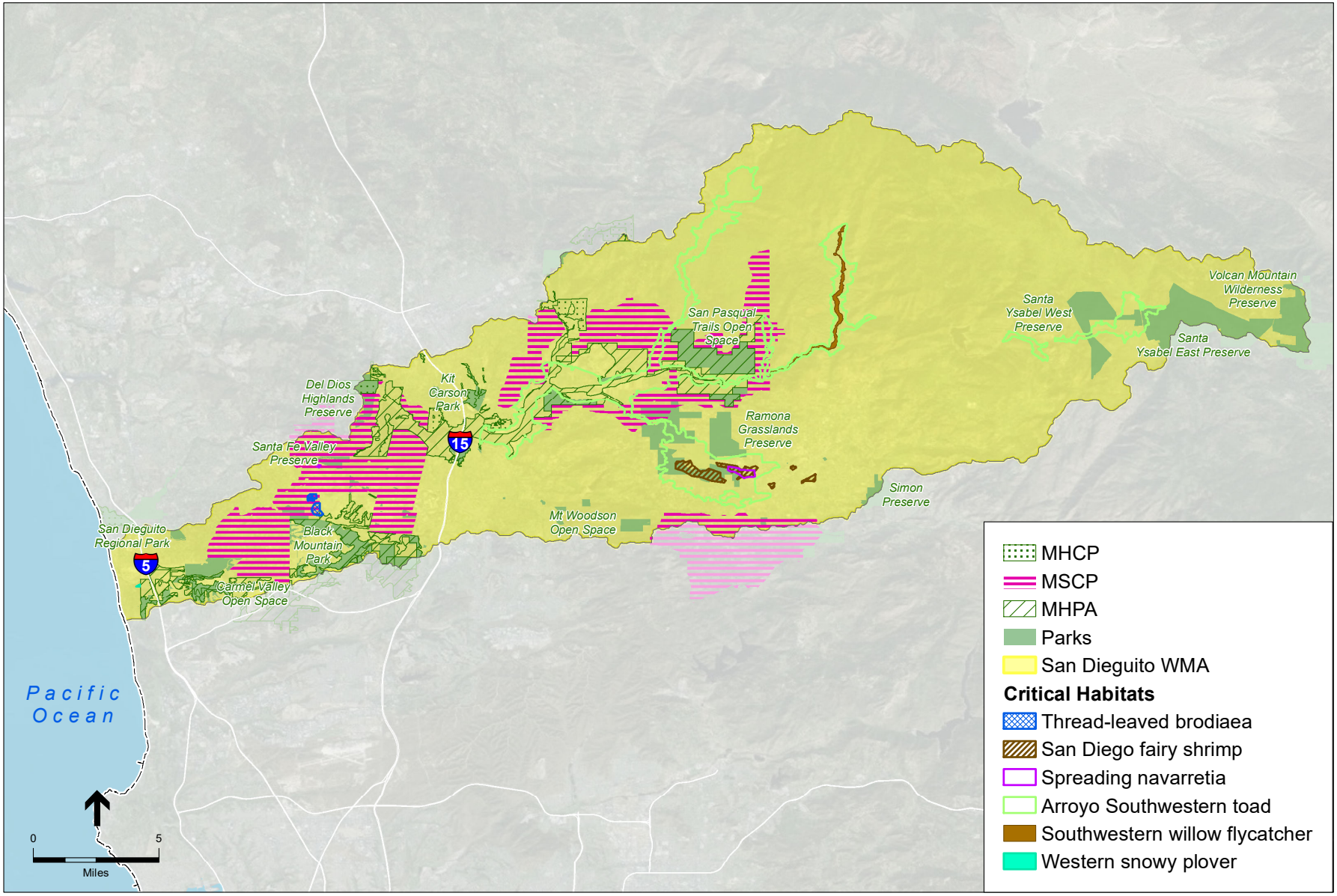
Figure 3-24

Water Agencies and Wastewater Agencies within the San Dieguito Water Management Area

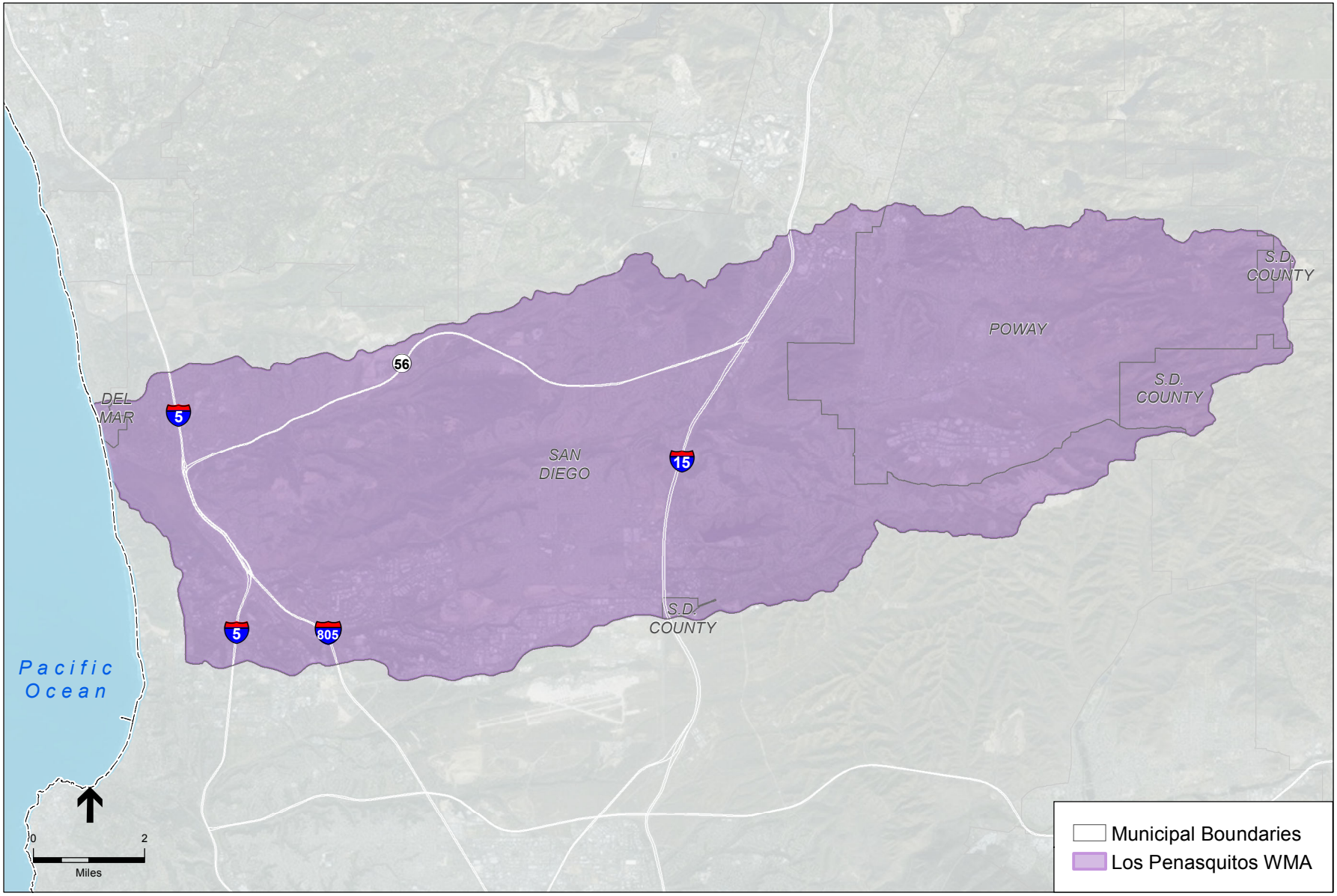


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-25

Critical Habitat within the San Dieguito Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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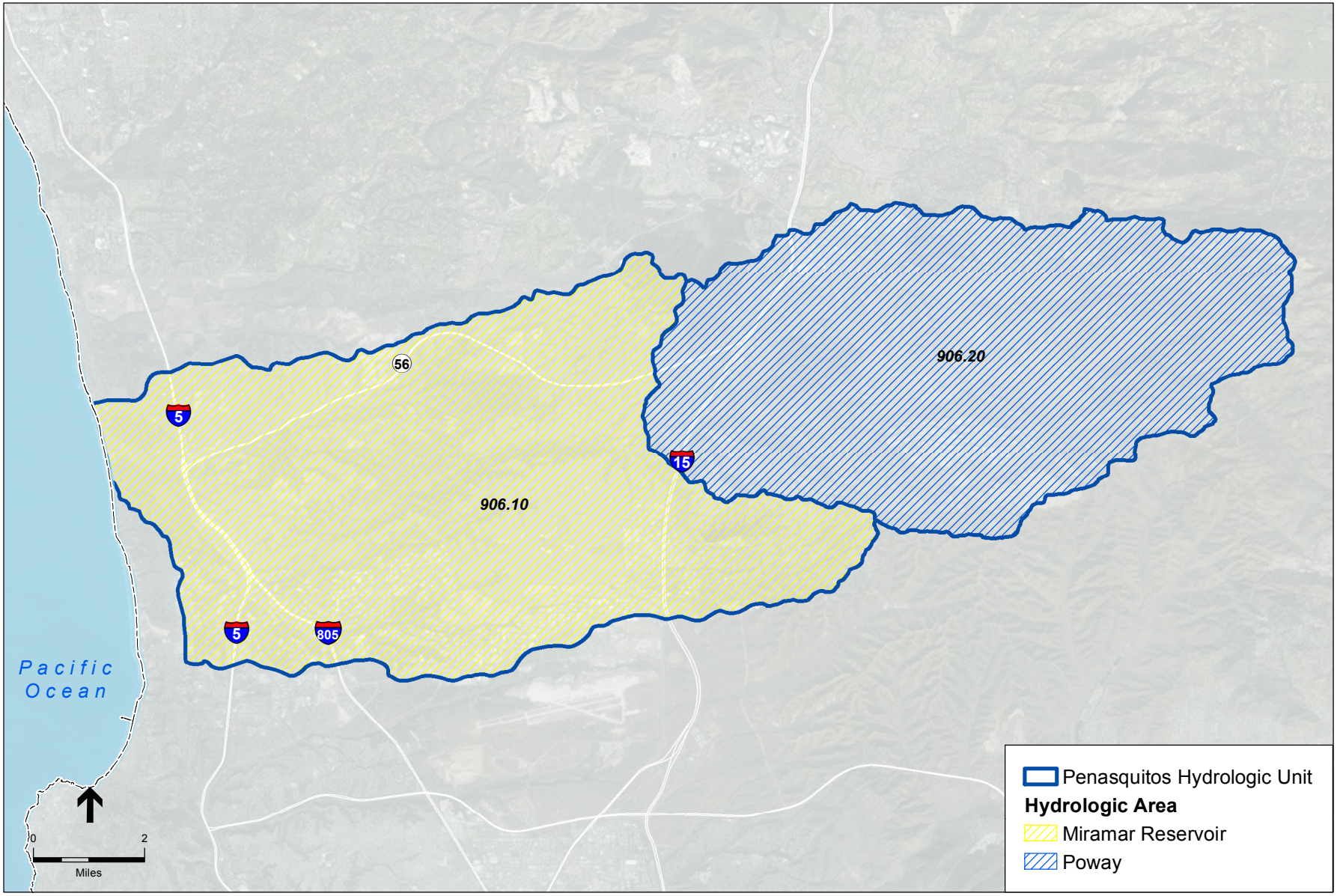
Figure 3-26
City Boundaries within the Los Penasquitos Water Management Area

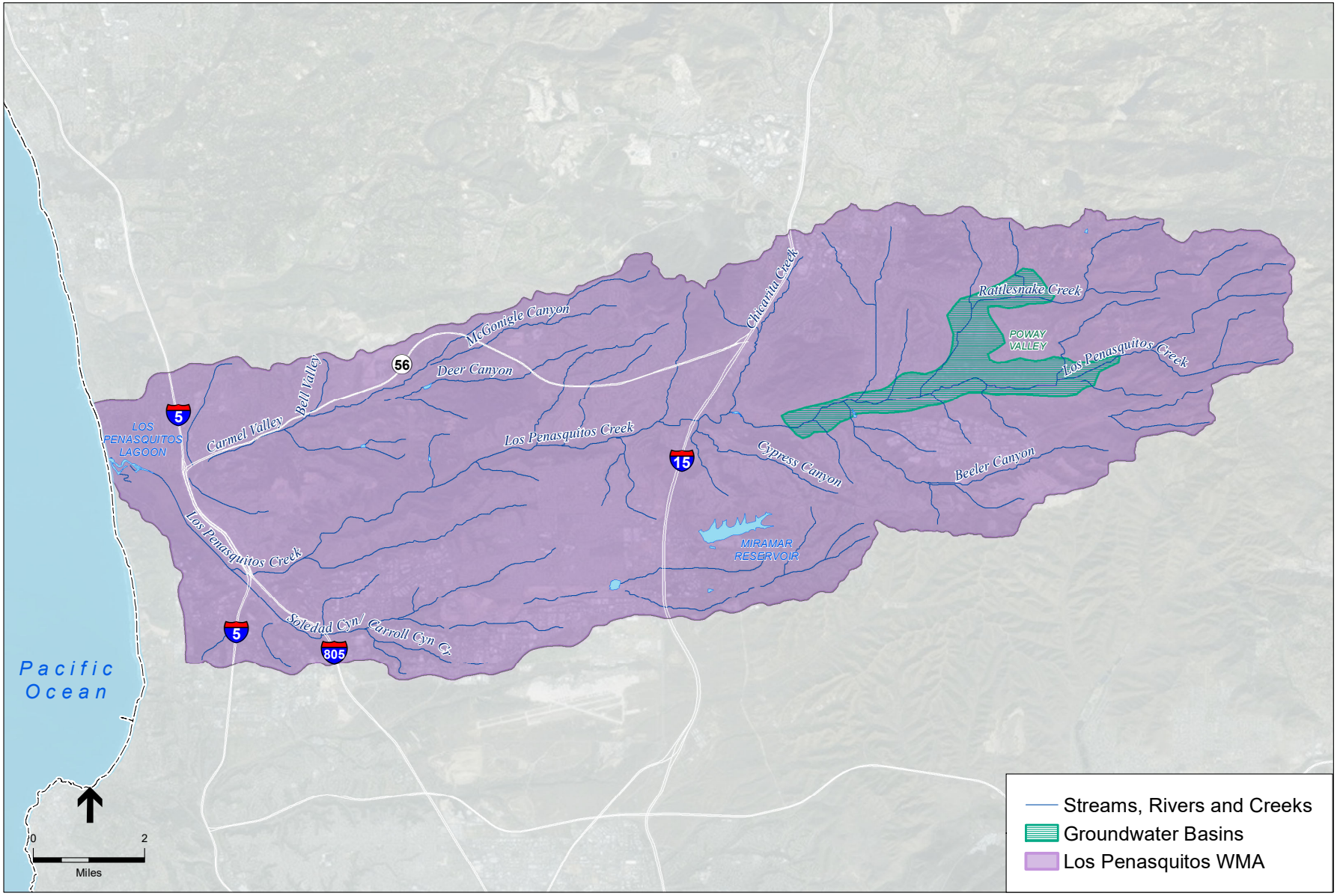


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-27

Hydrologic Units and Areas within the Los Penasquitos Water Management Area

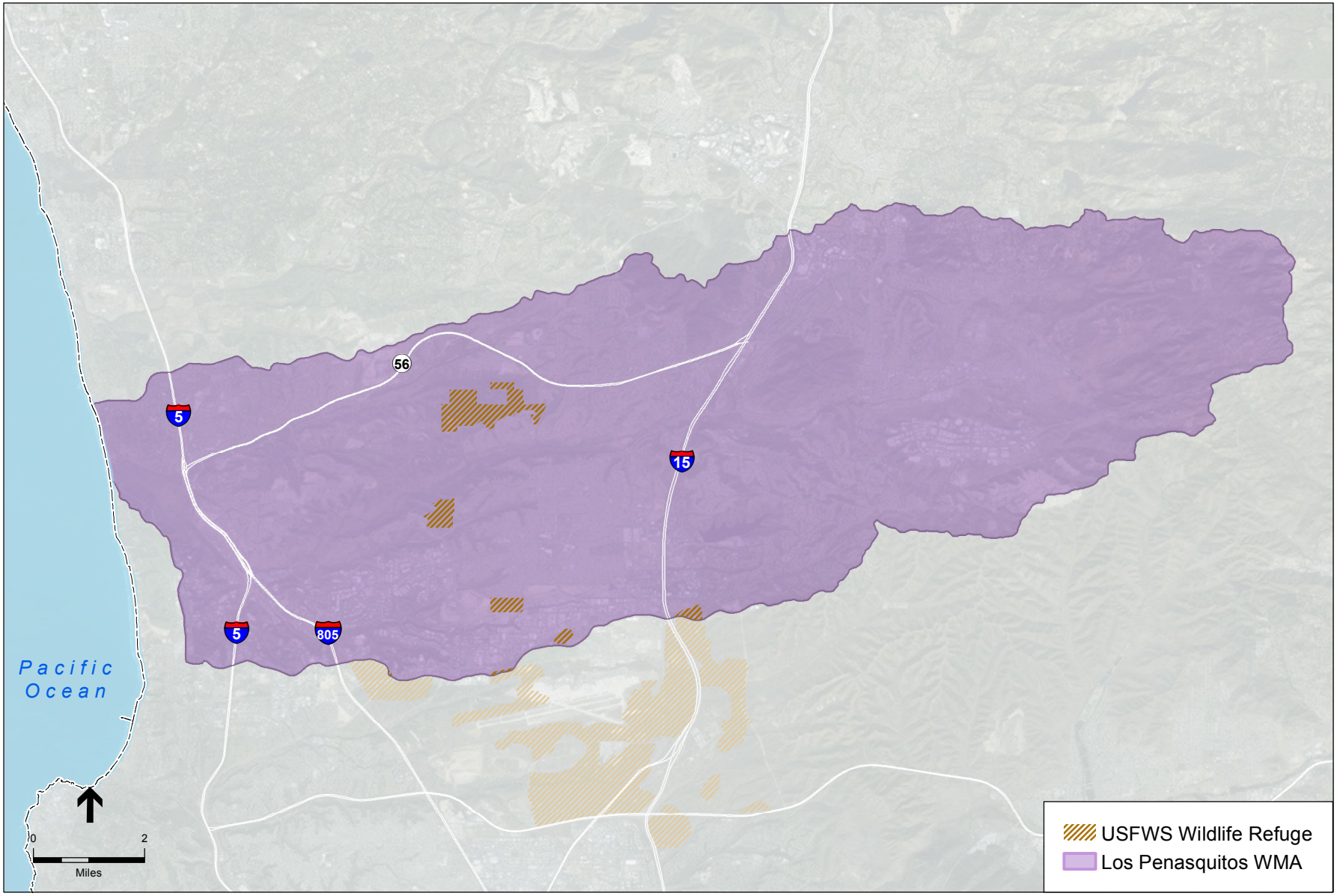


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-28

Water Features within the Los Penasquitos Water Management Area

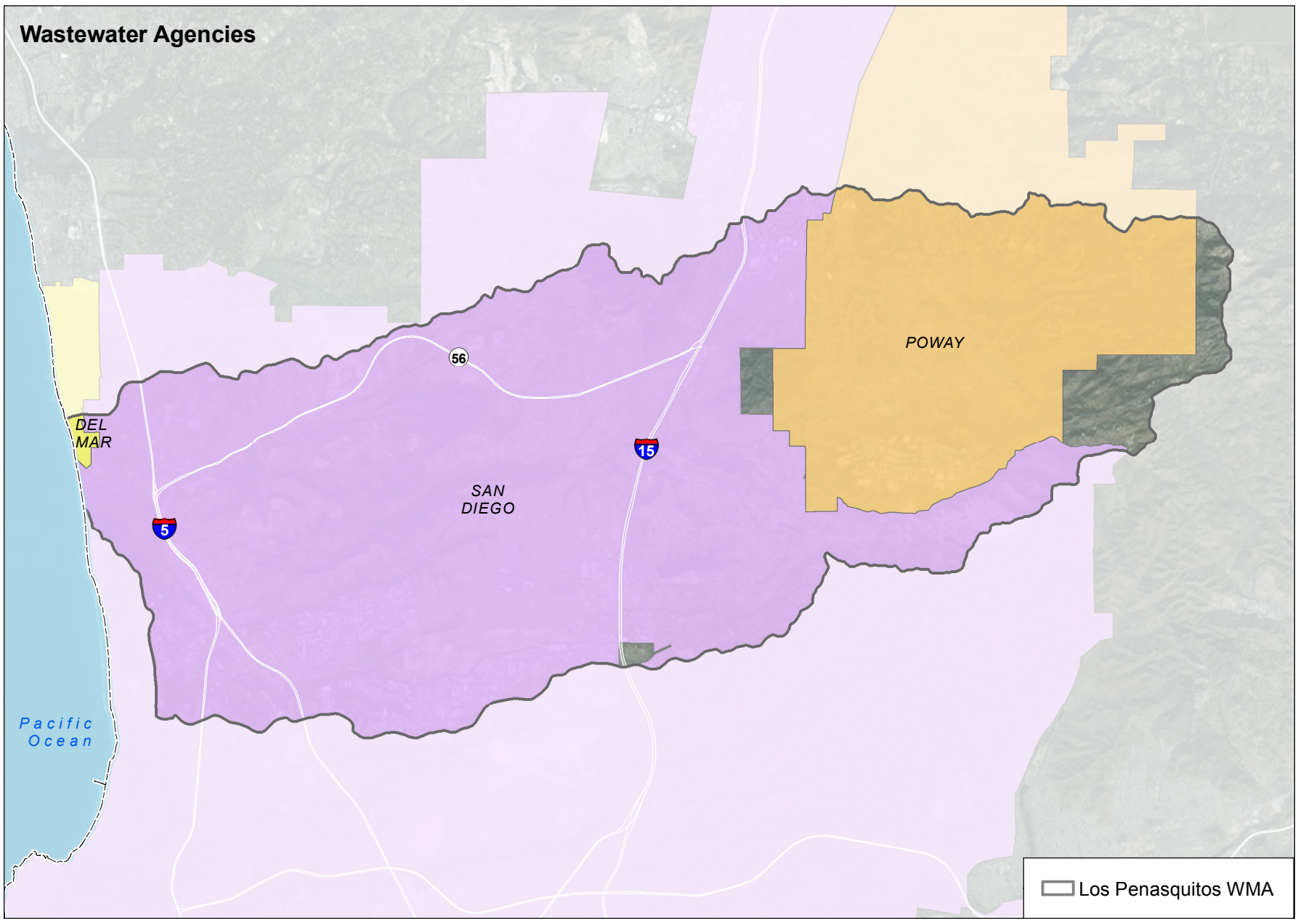


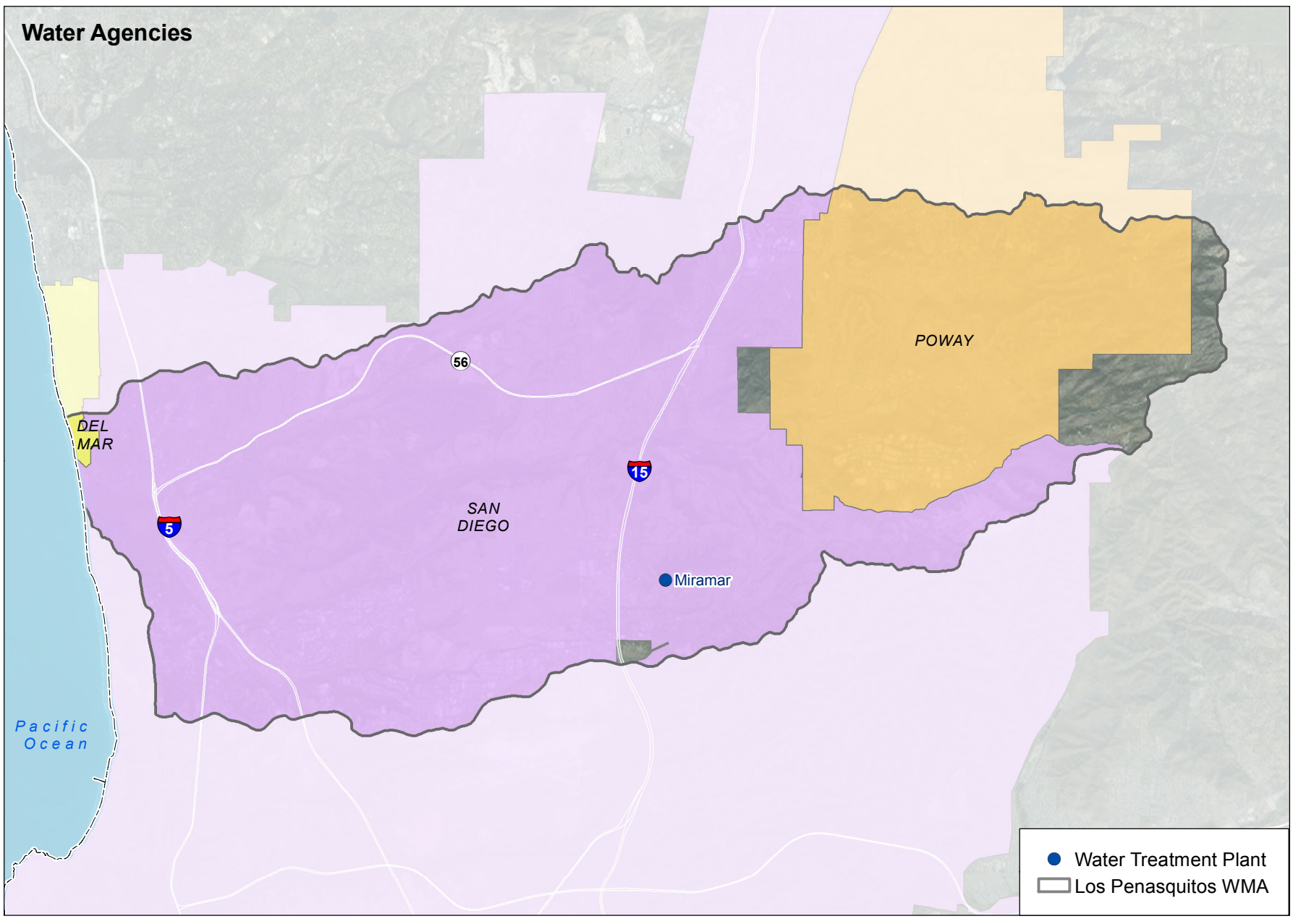
SOURCE: ESRI, 2016; SanGIS, 2016; USFWS, 2016

SWRP . 160618

Figure 3-29

Land Use Agencies within the Los Penasquitos Water Management Area



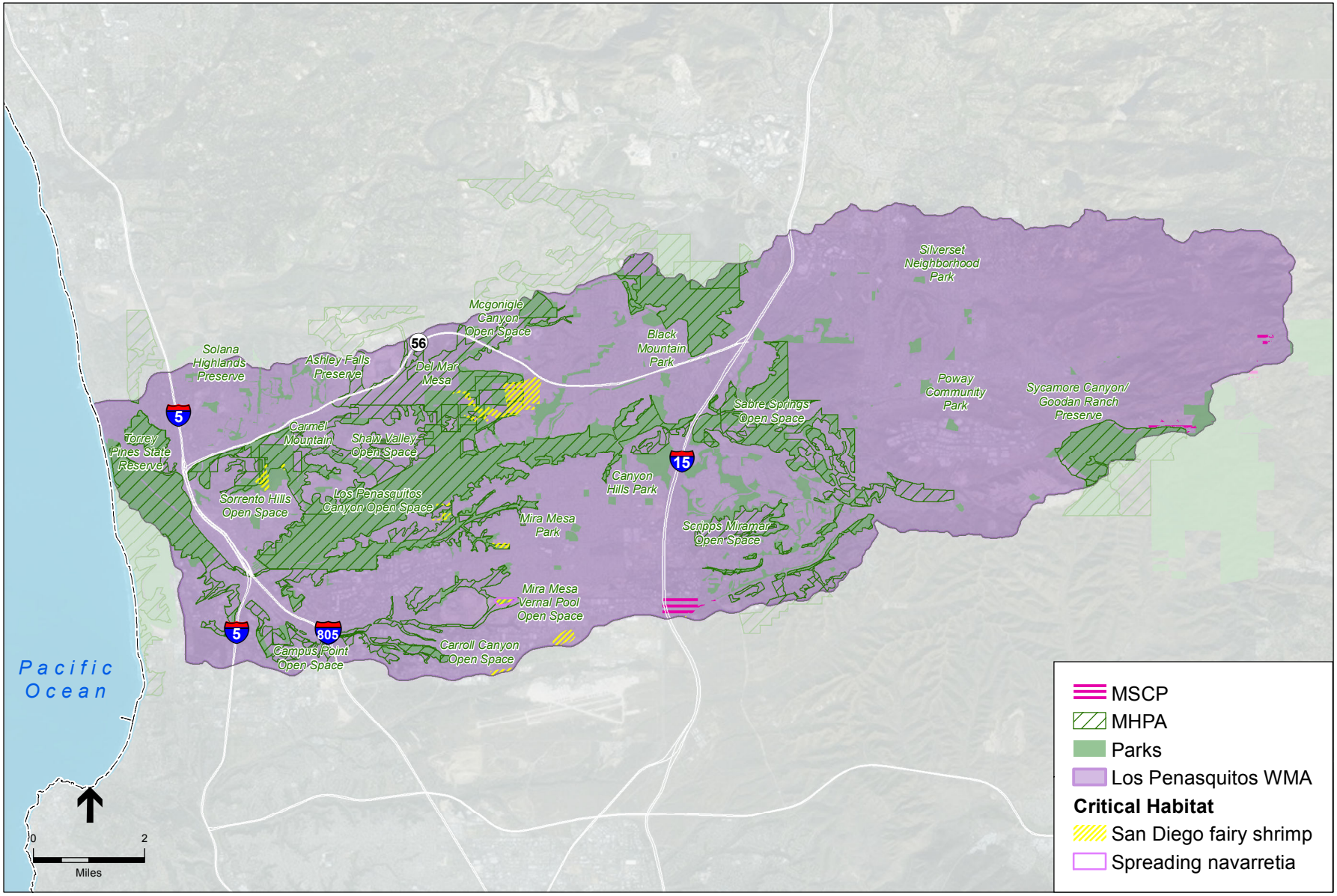


SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

SWRP . 160618

Figure 3-30

Water Agencies and Wastewater Agencies within the Los Penasquitos Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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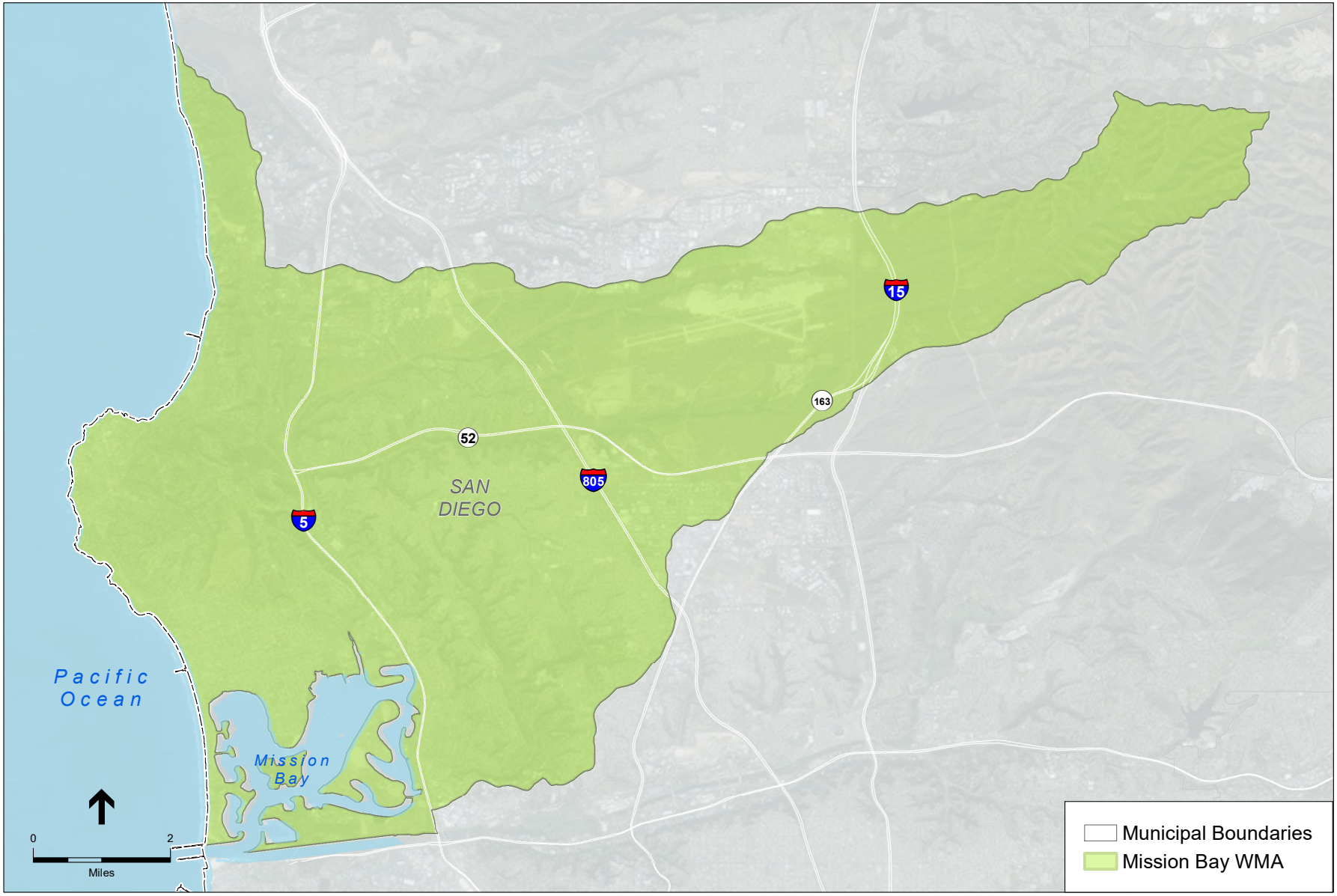
Figure 3-31

Critical Habitat within the Los Penasquitos Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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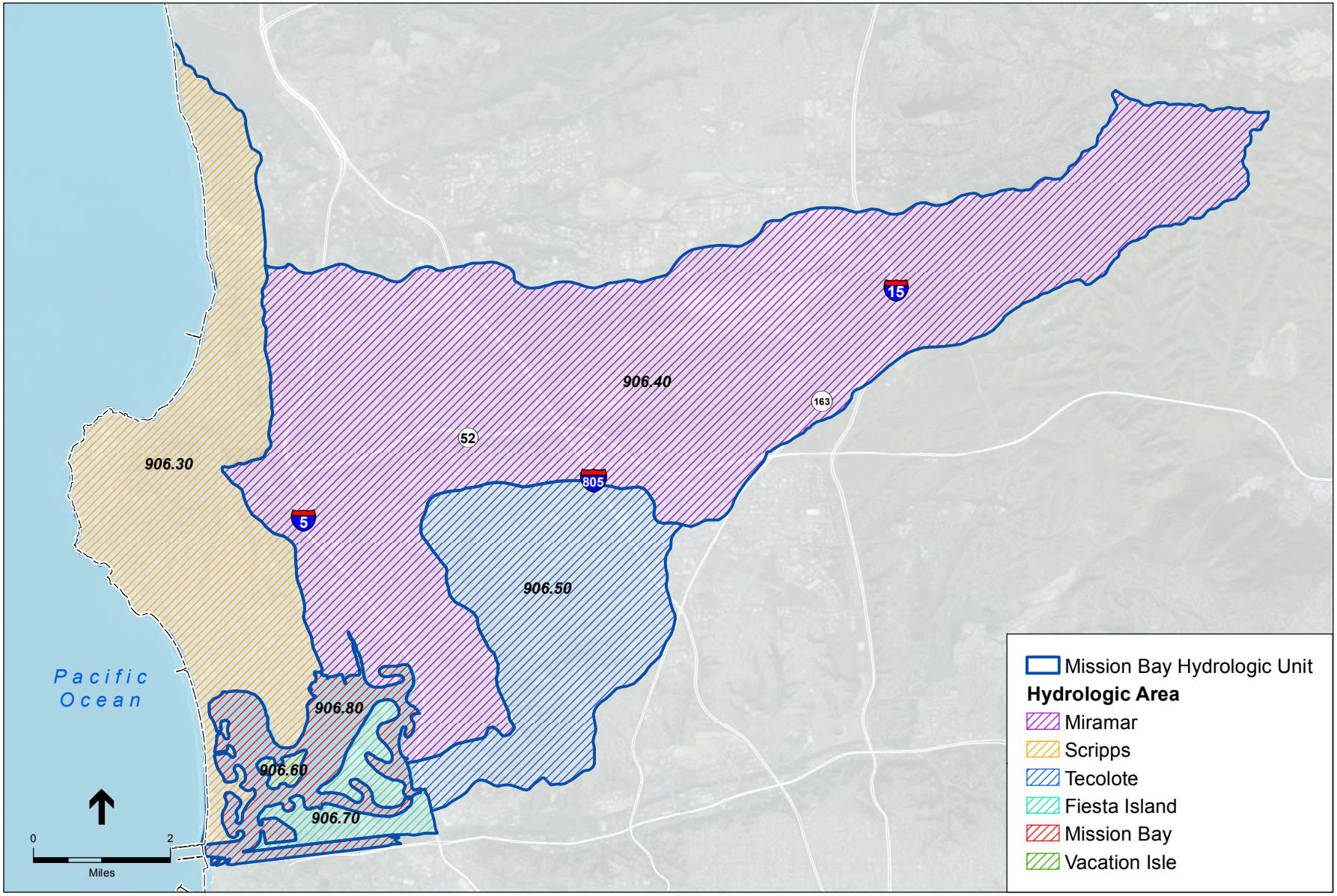
Figure 3-32
City Boundaries within the Mission Bay Water Management Area

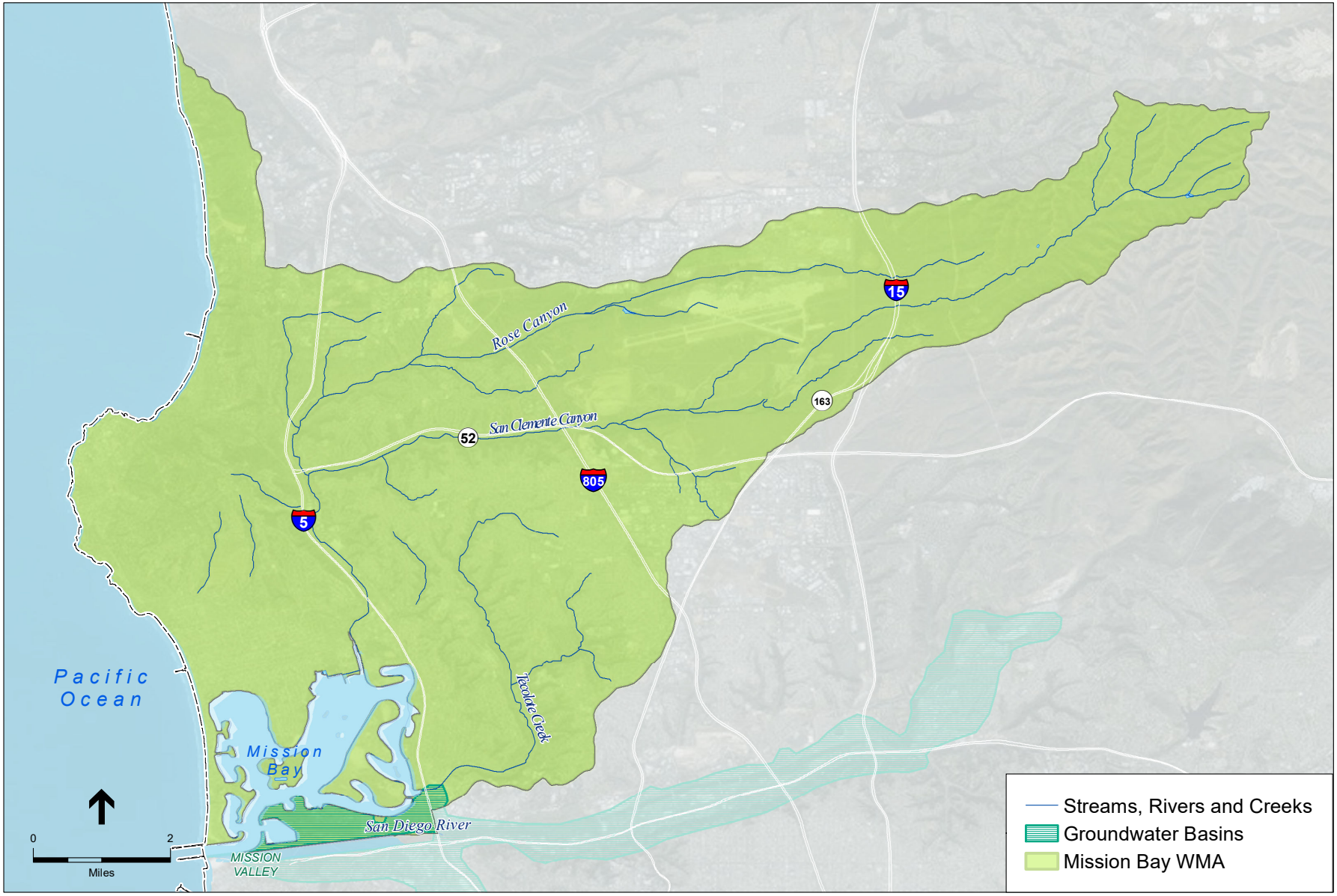


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-33

Hydrologic Units and Areas within the Mission Bay Water Management Area

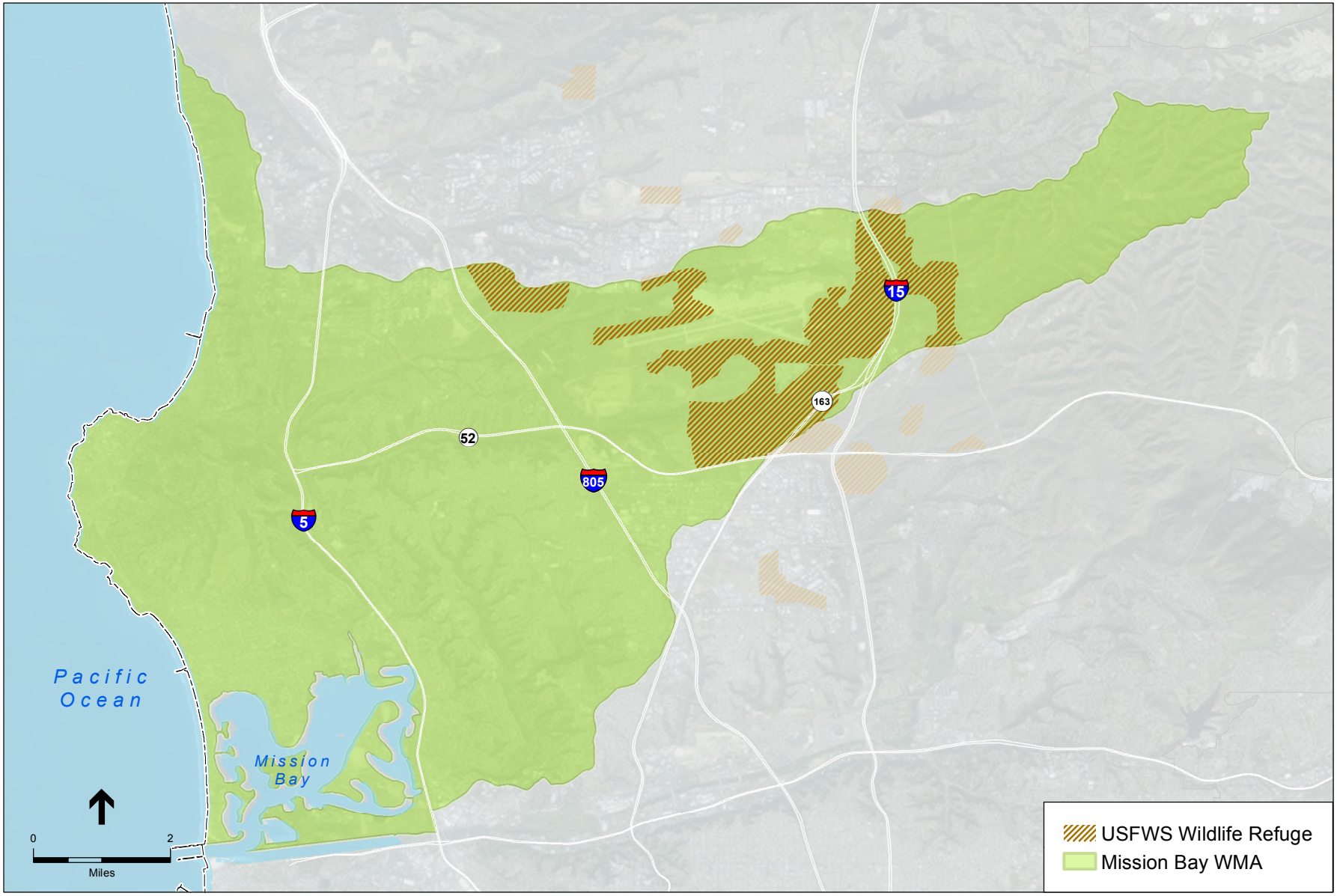


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-34

Water Features within the Mission Bay Water Management Area



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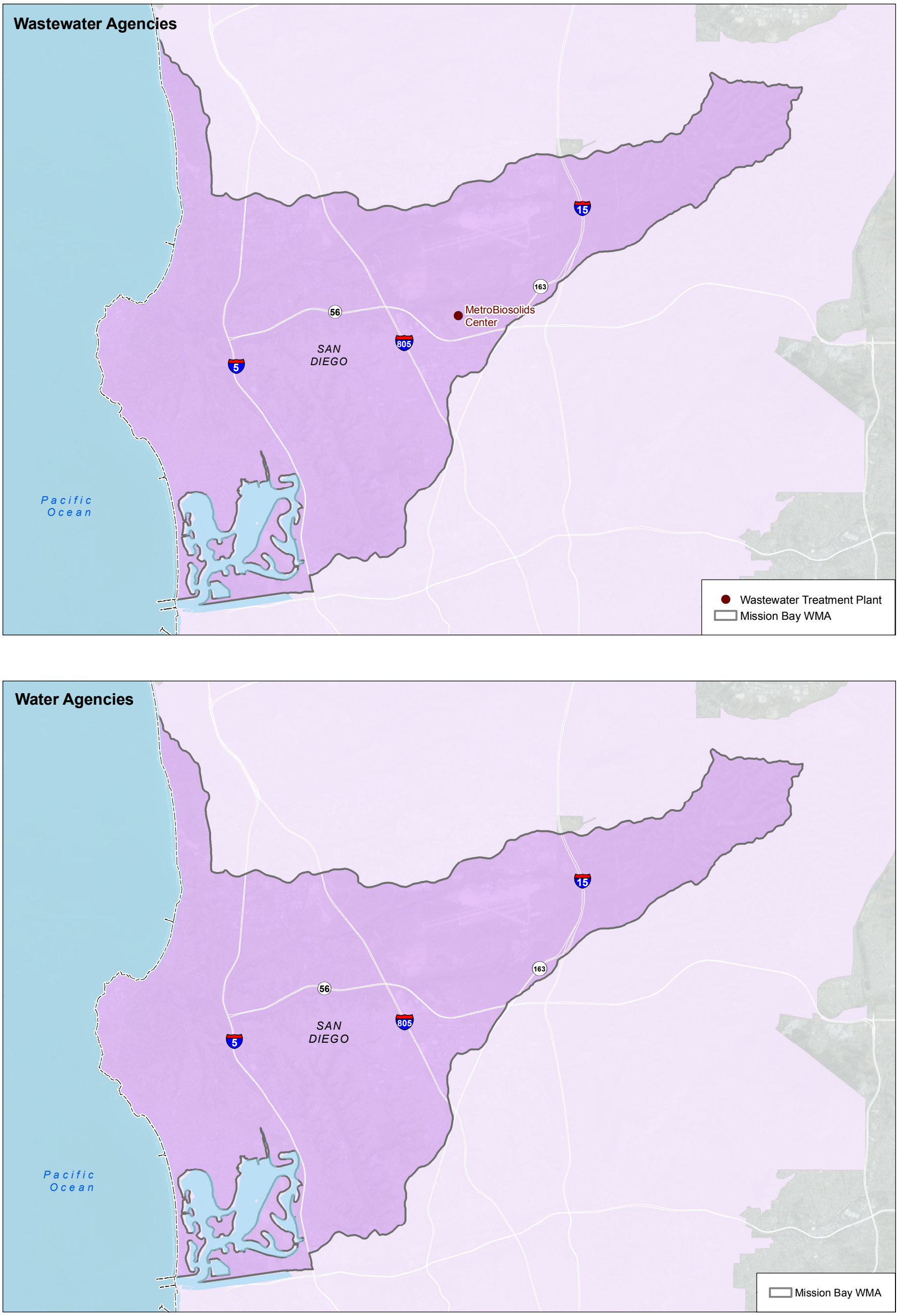
SOURCE: ESRI, 2016; SanGIS, 2016; USFWS, 2016

Figure 3-35
Land Use Agencies within the Mission Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

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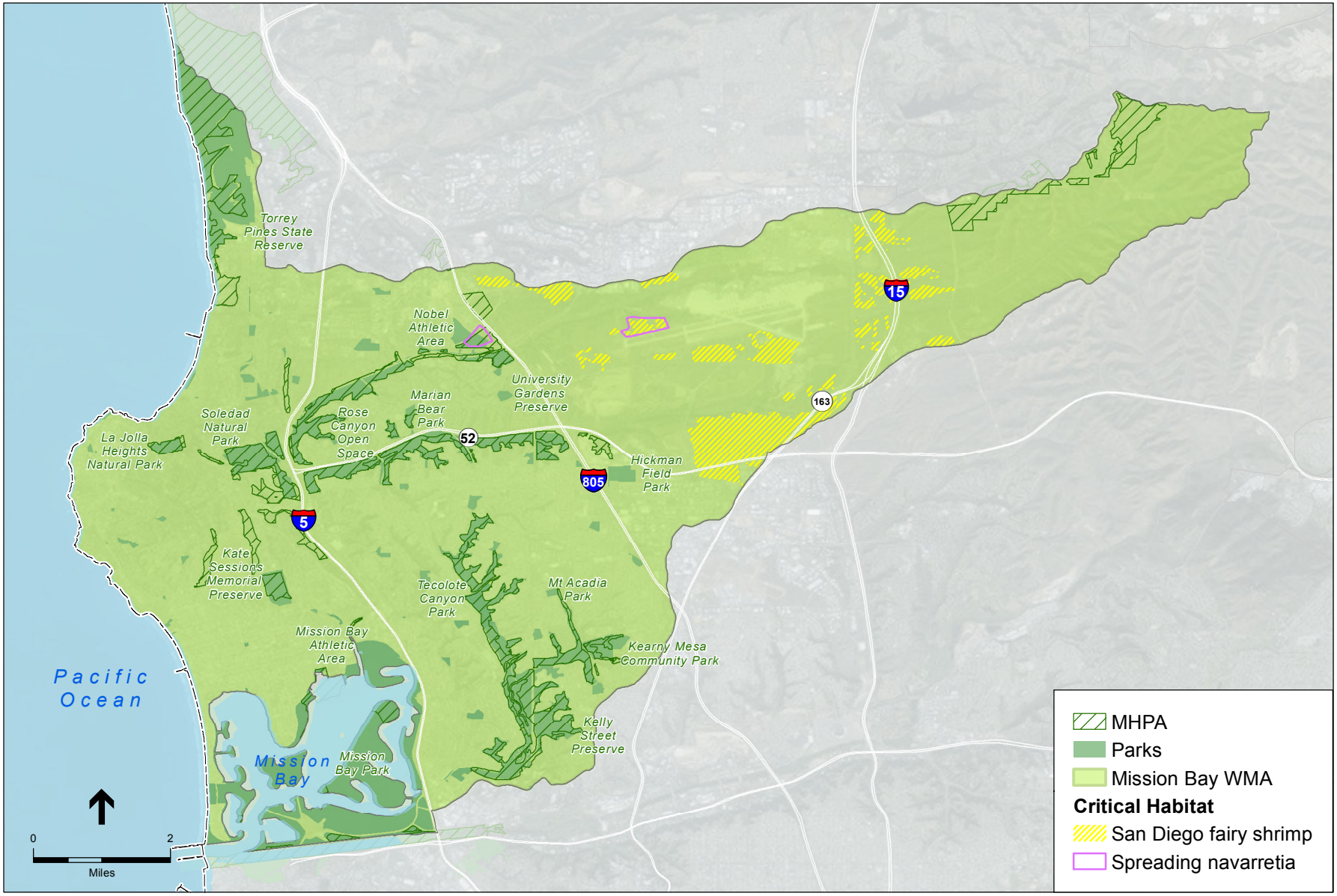
Figure 3-36

Water Agencies and Wastewater Agencies within the Mission Bay Water Management Area

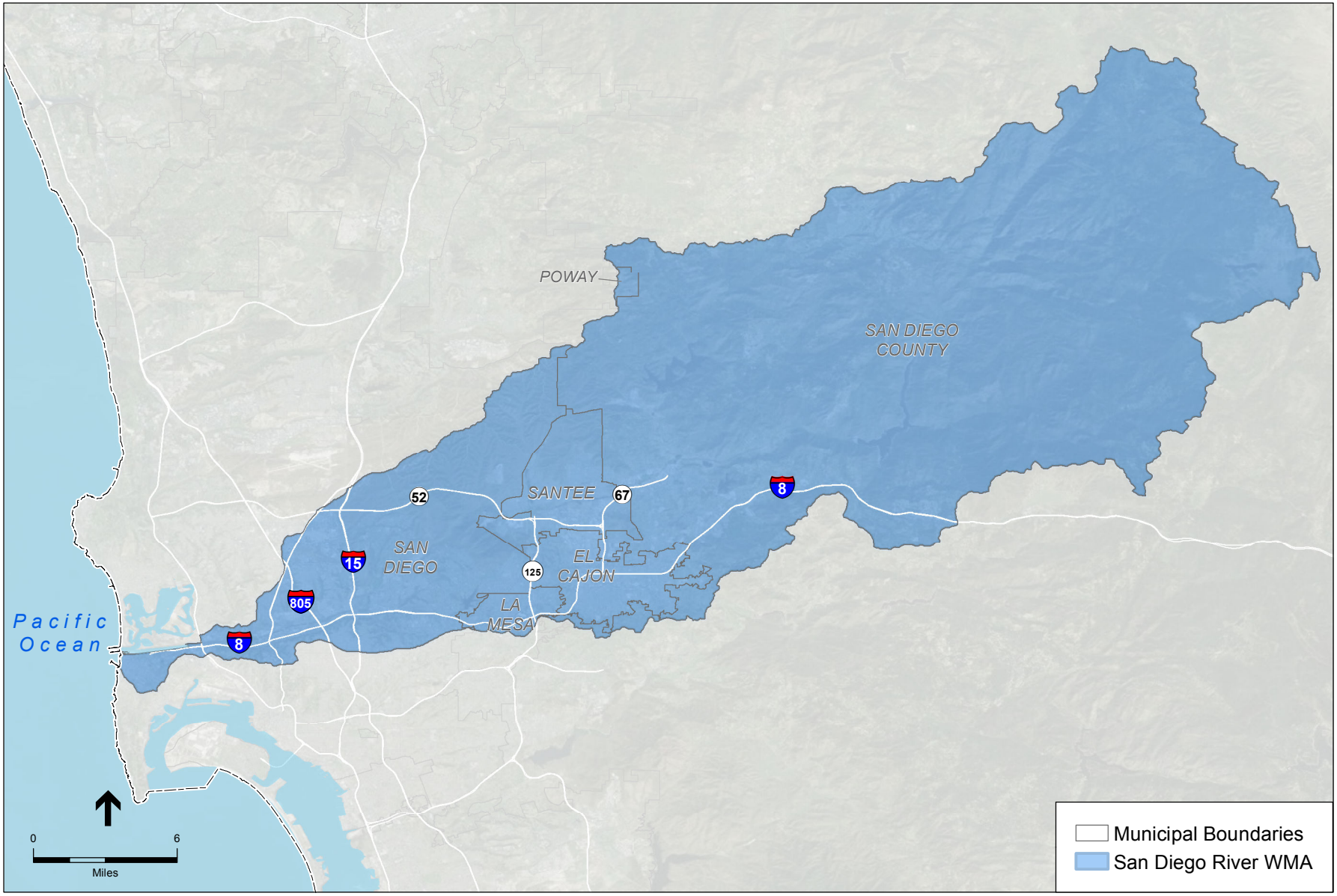


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-37

Critical Habitat within the Mission Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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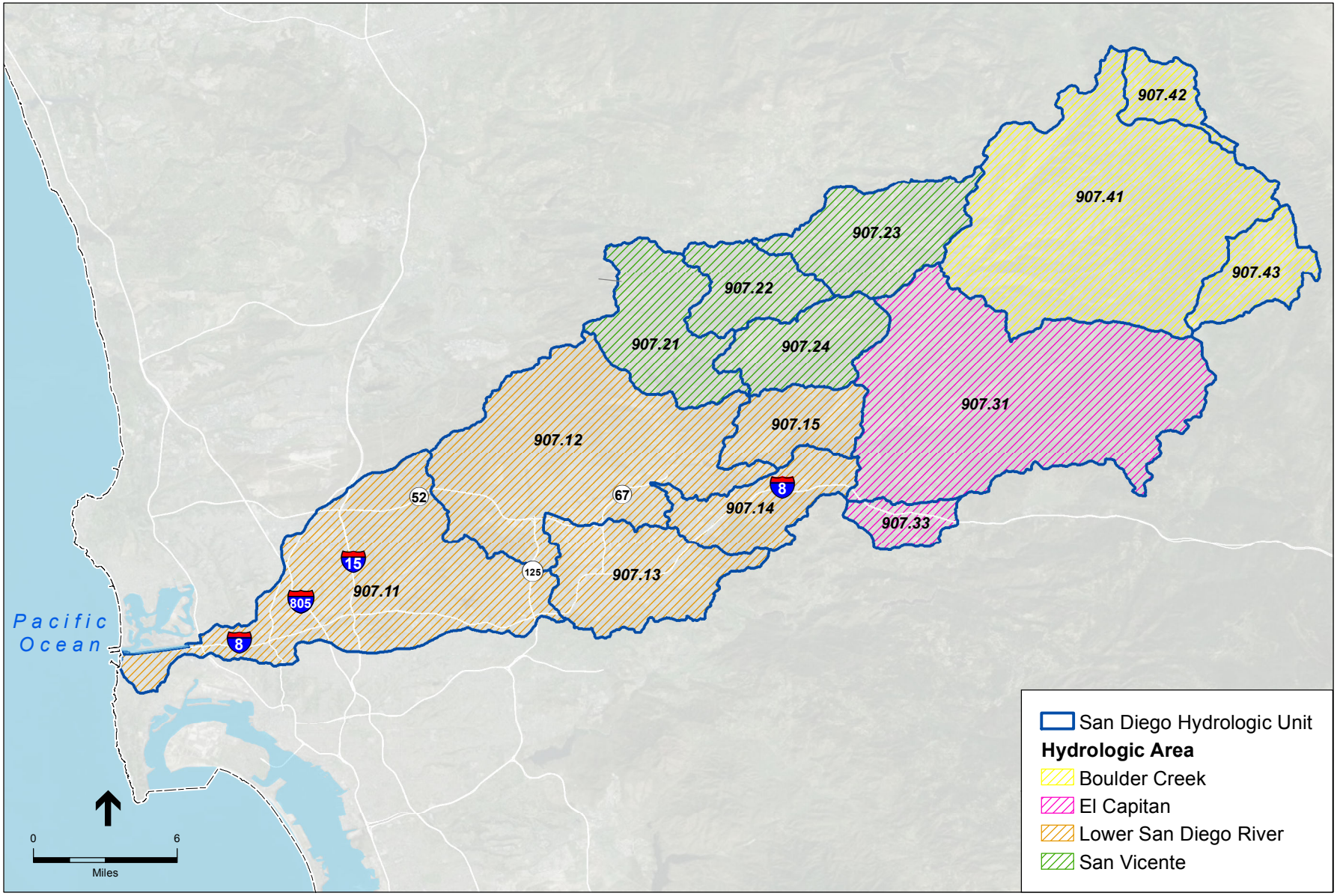
Figure 3-38

City Boundaries within the San Diego River Water Management Area

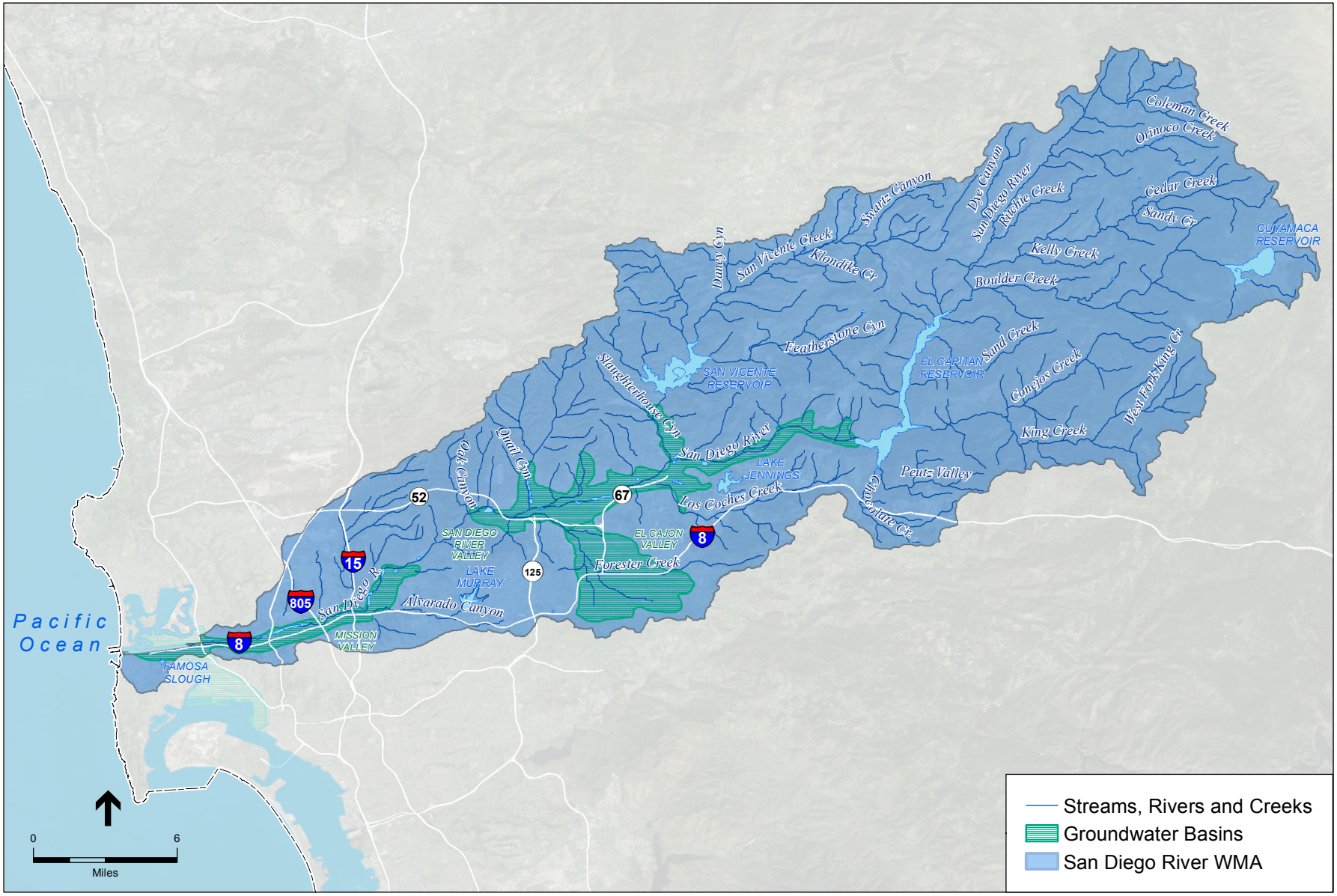


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-39

Hydrologic Units and Areas within the San Diego River Water Management Area

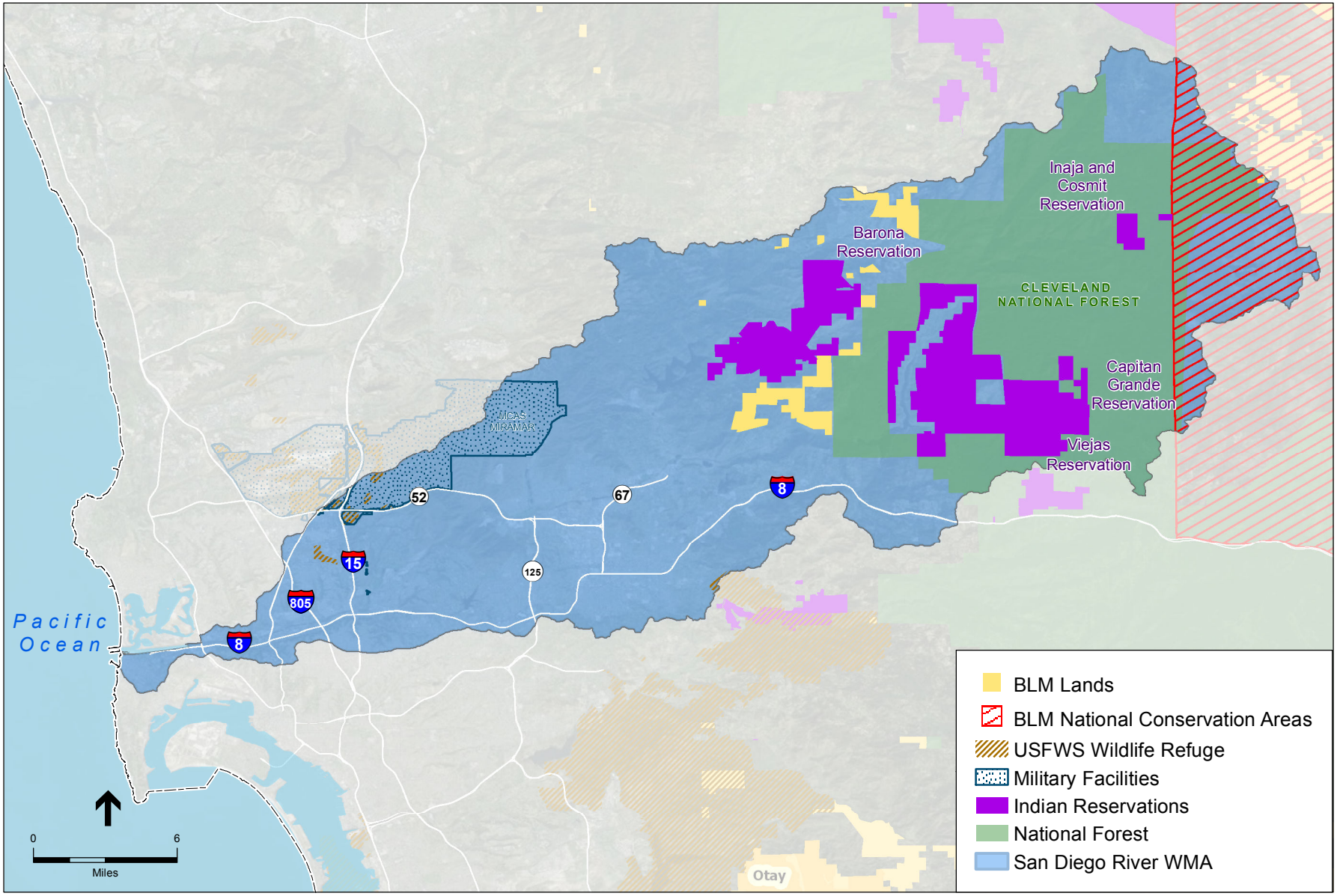


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-40

Water Features within the San Diego River Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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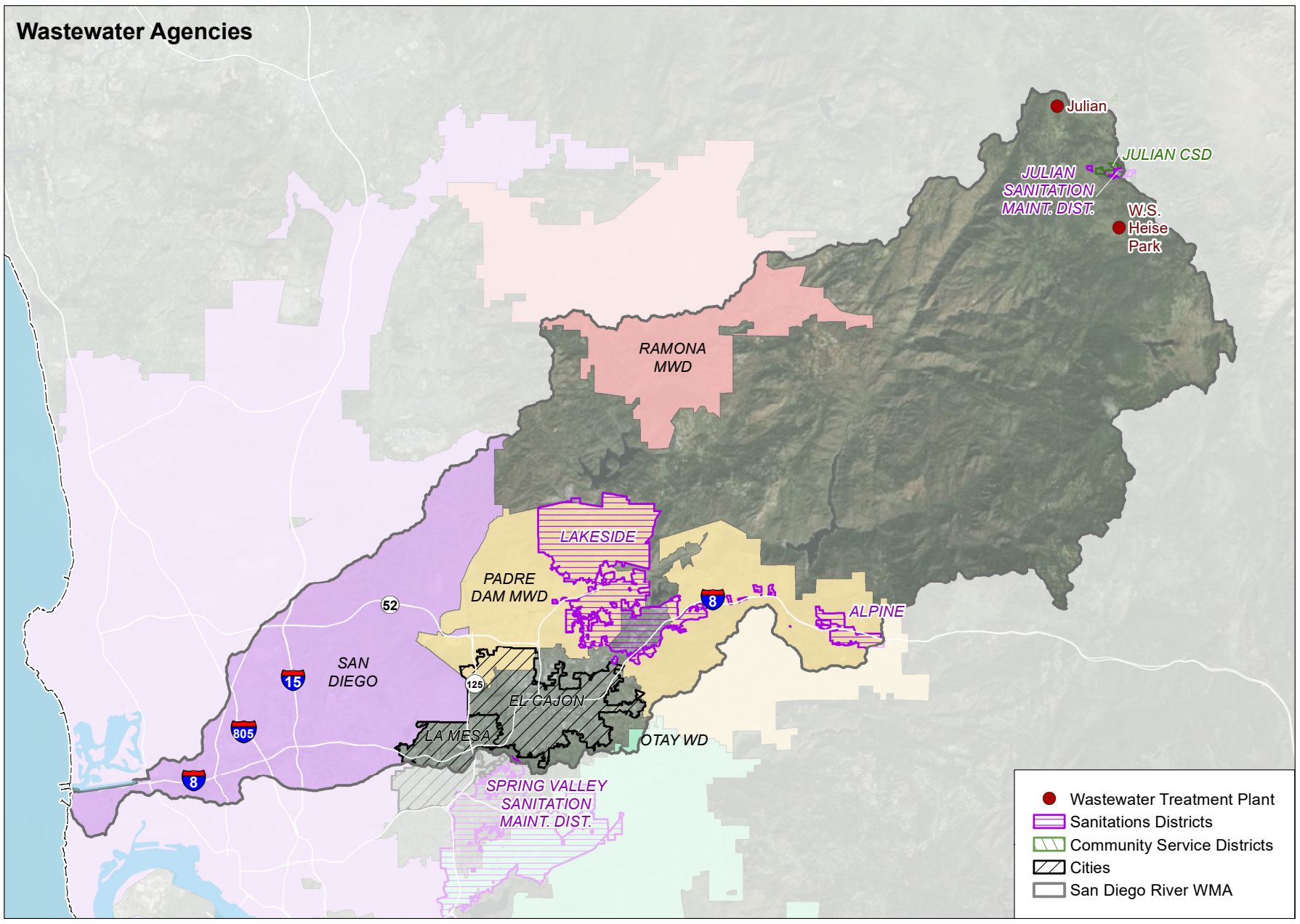
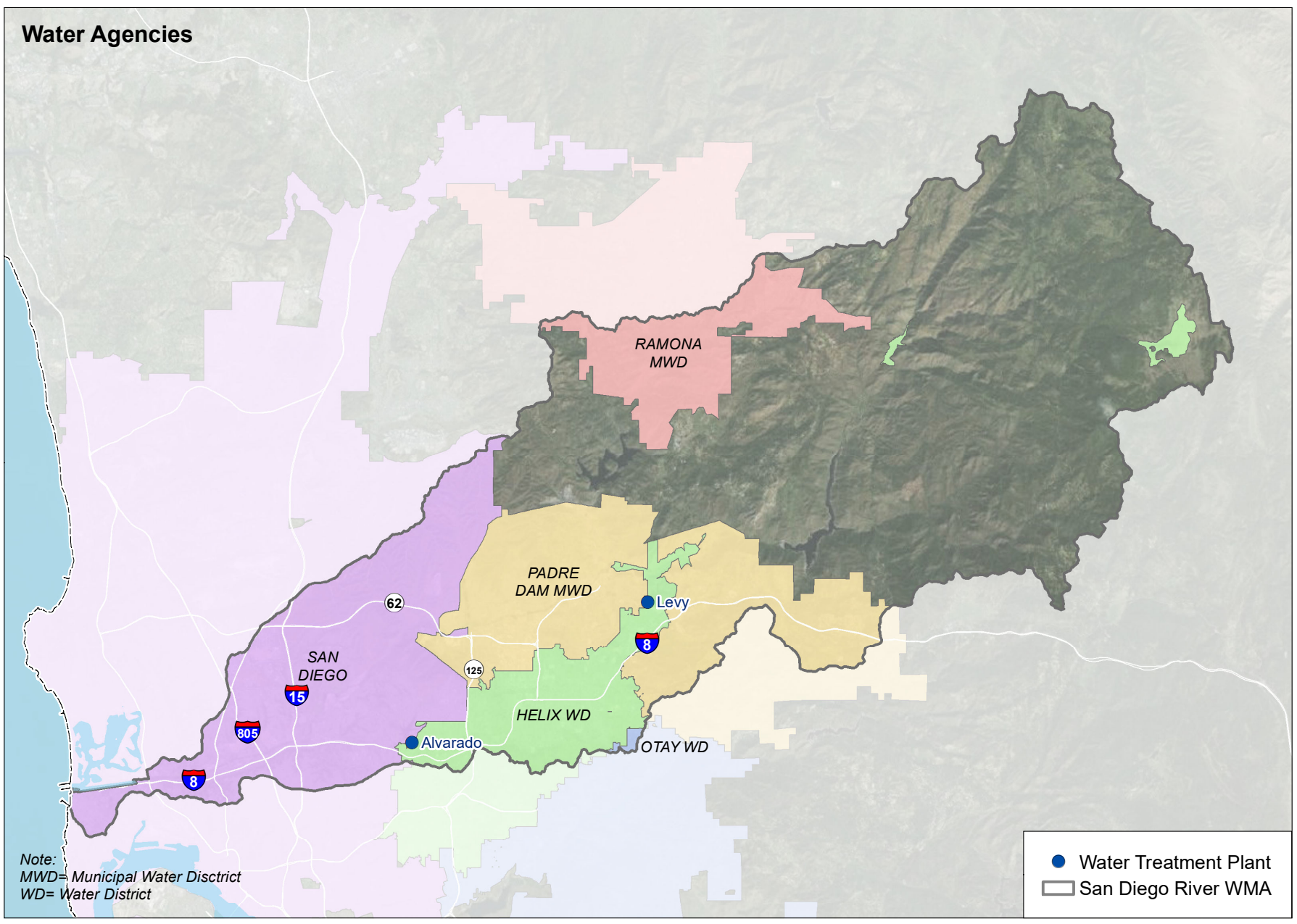
Figure 3-41

Land Use Agencies within the San Diego River Water Management Area



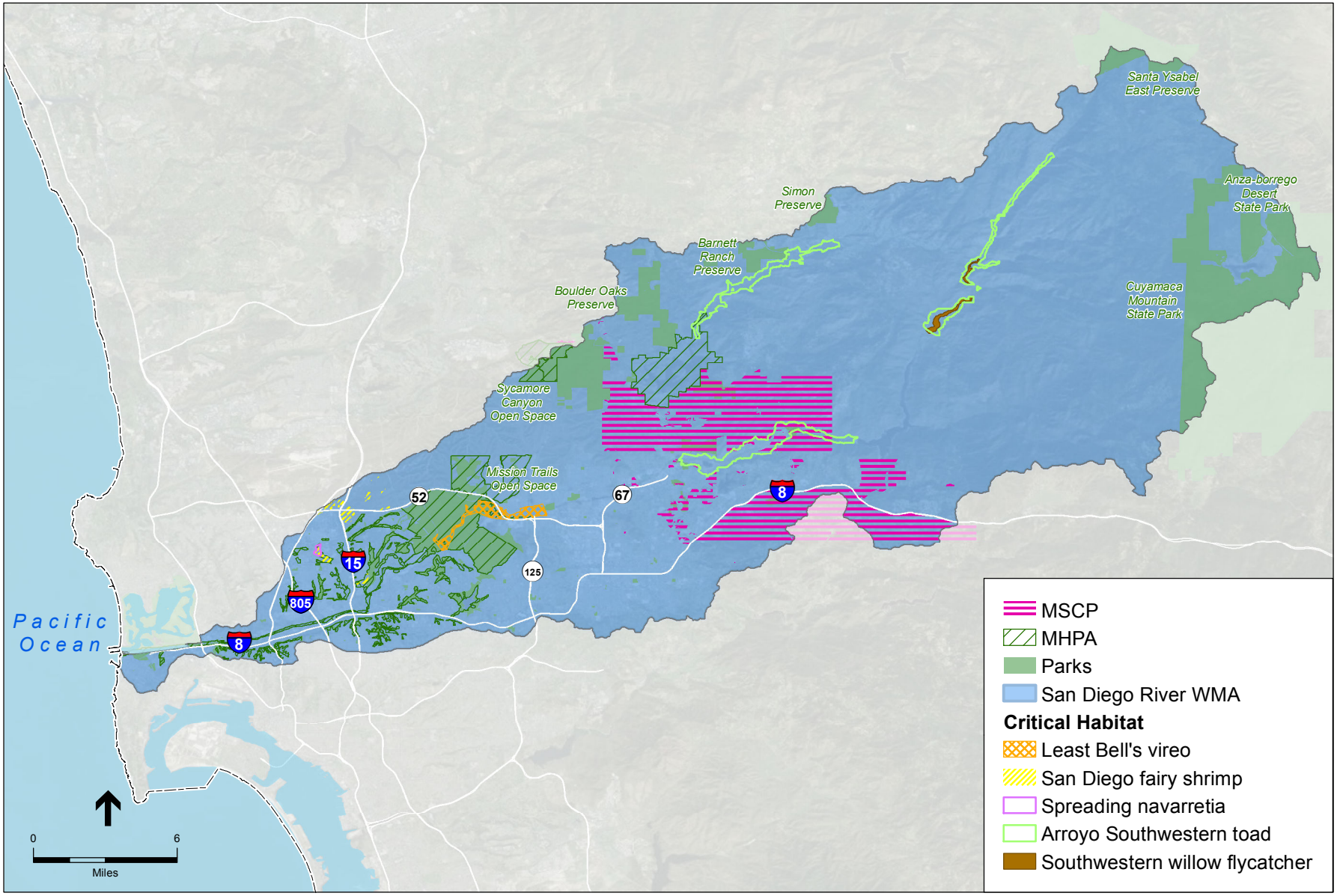


SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

SWRP . 160618

Figure 3-42

Water Agencies and Wastewater Agencies within the San Diego River Water Management Area

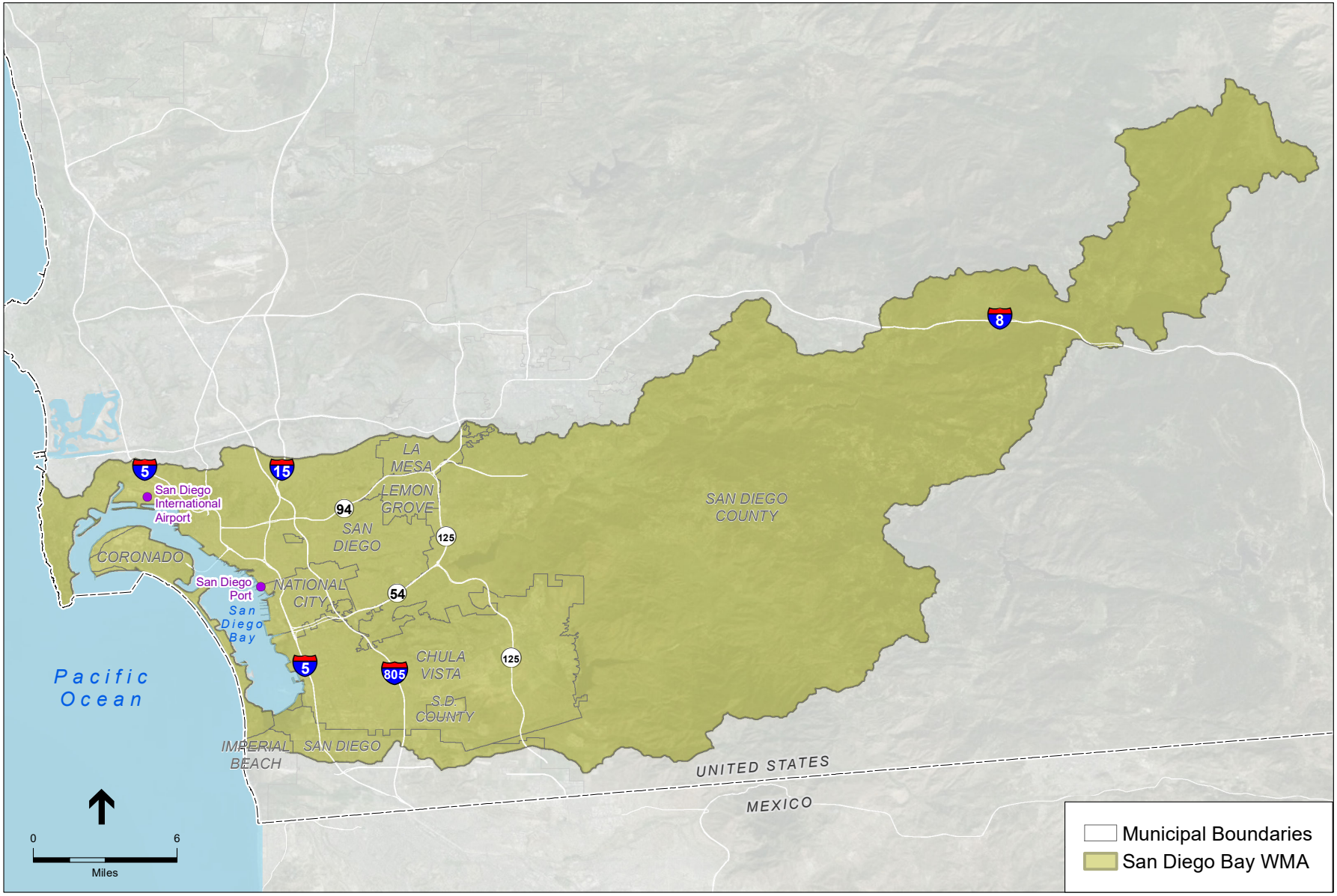


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-43

Critical Habitat within the San Diego River Water Management Area

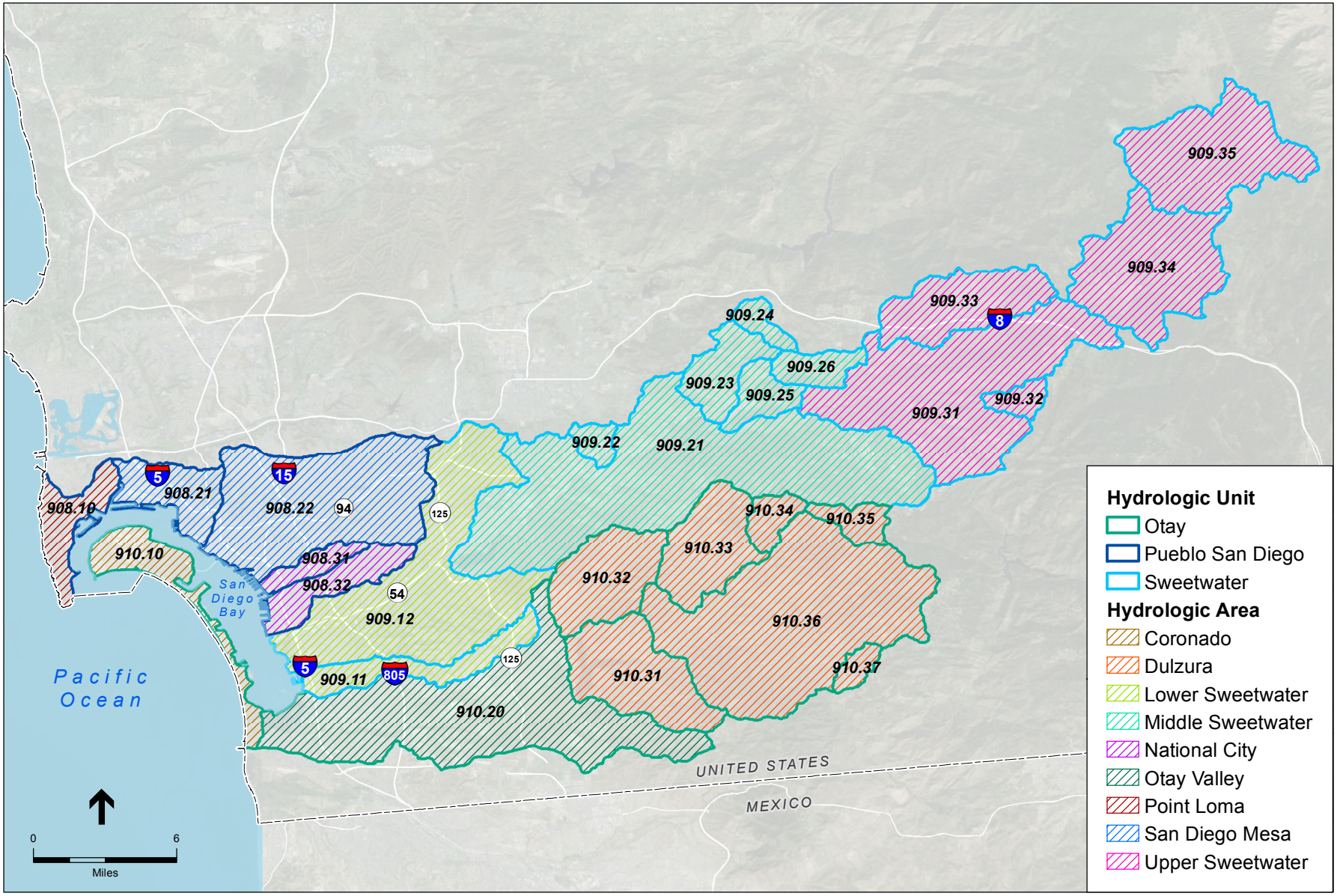


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-44

City Boundaries within the San Diego Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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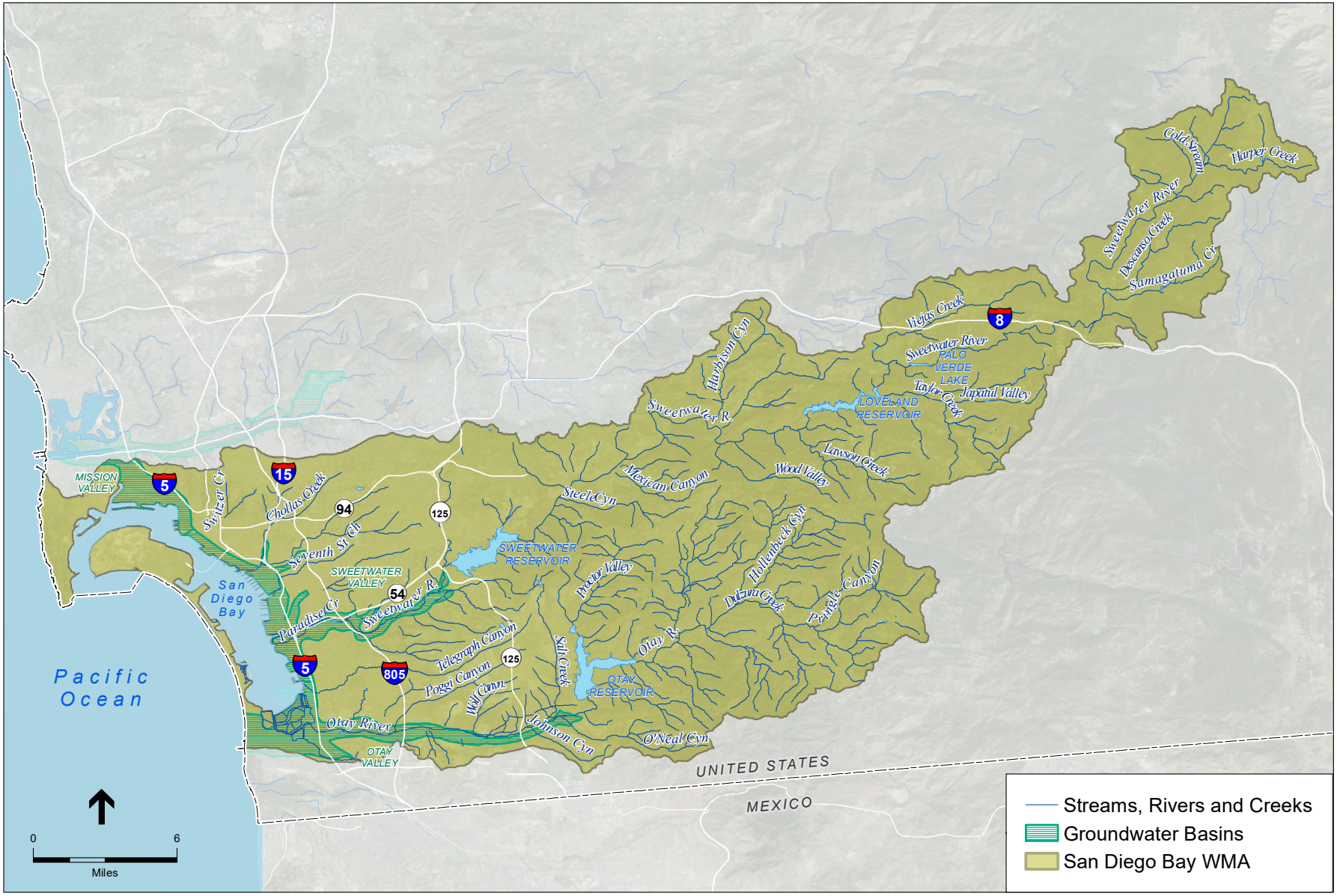
Figure 3-45

Hydrologic Units and Areas within the San Diego Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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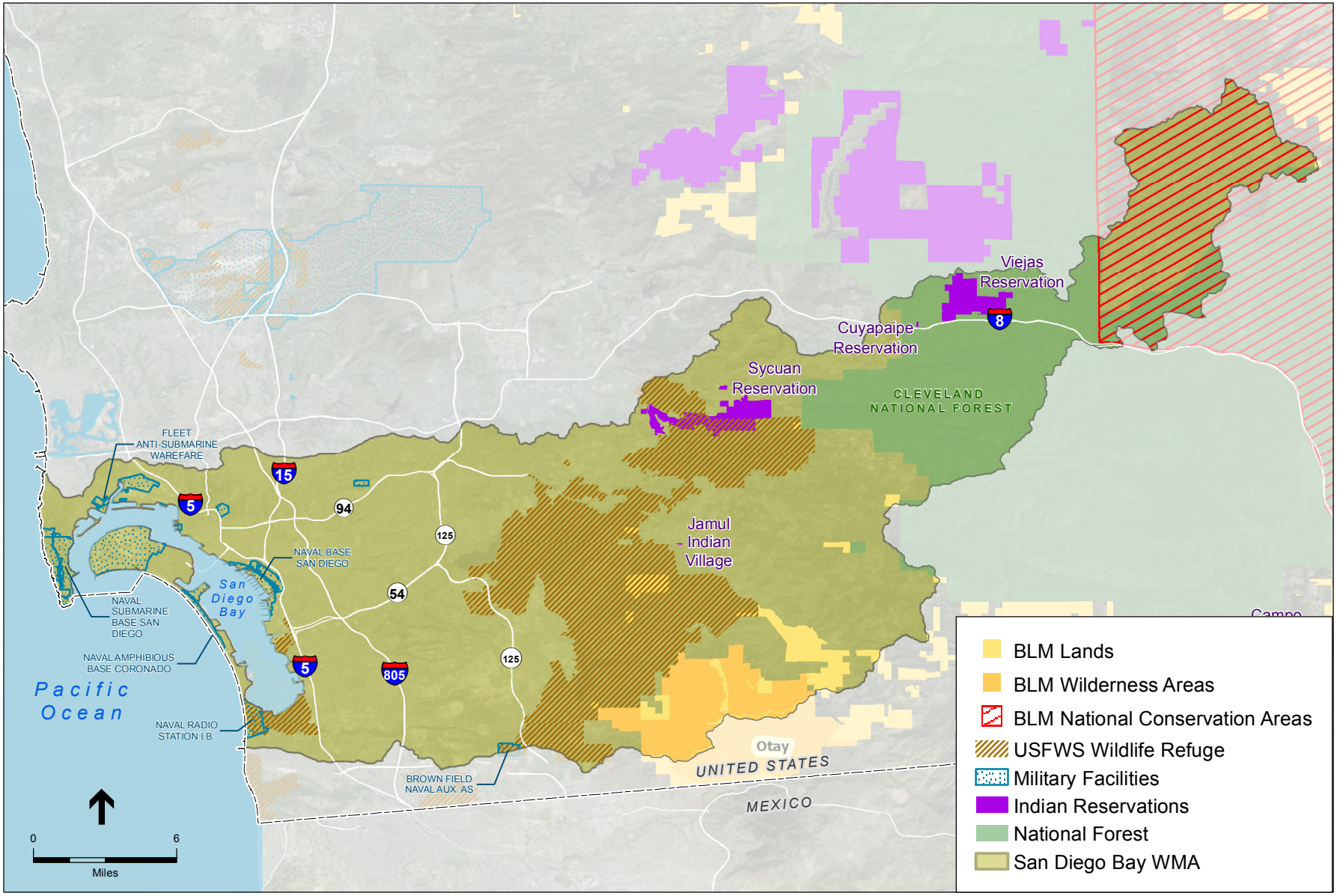
Figure 3-46

Water Features within the San Diego Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016; Bureau of Land Management

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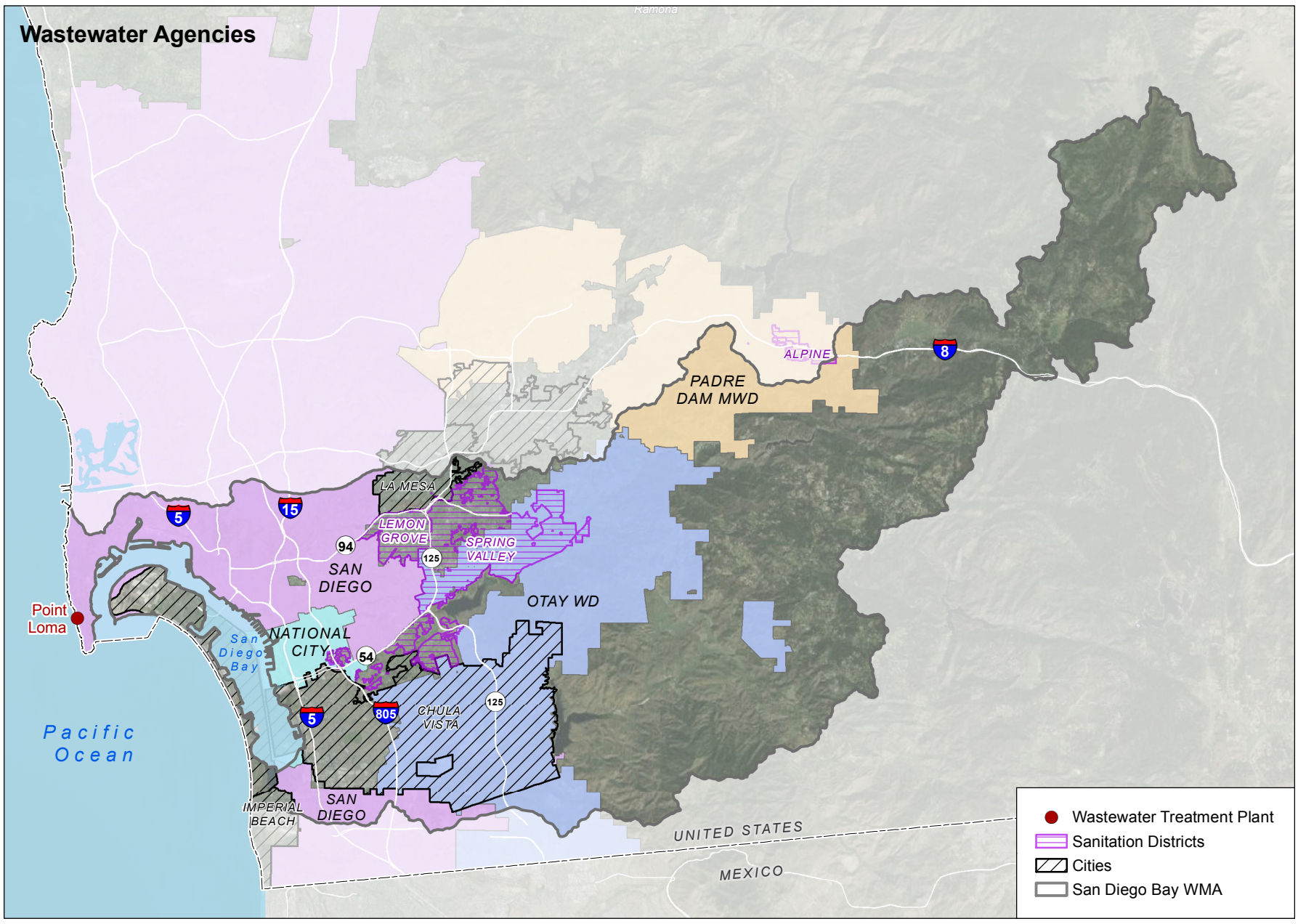
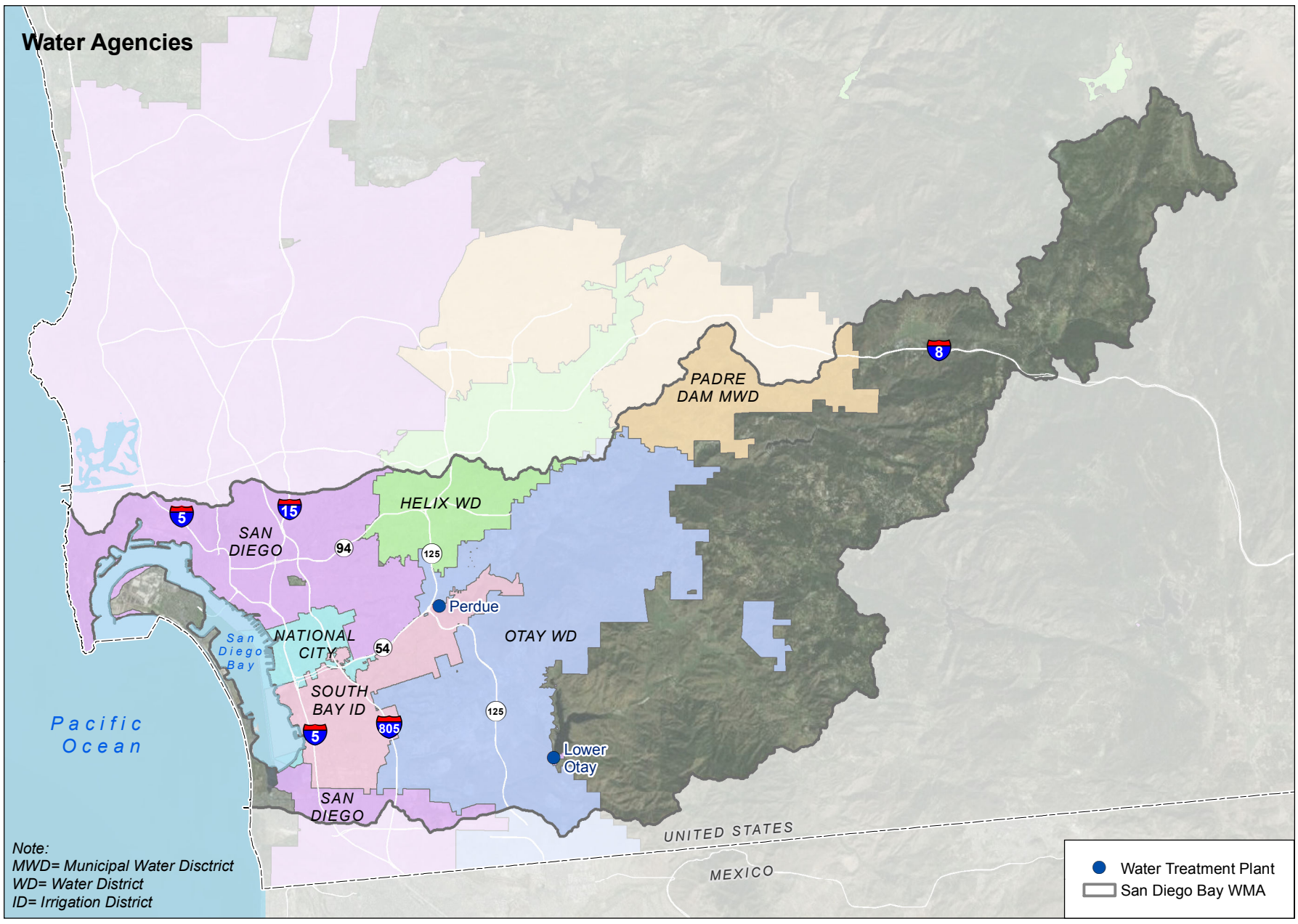
Figure 3-47

Land Use Agencies within the San Diego Bay Water Management Area



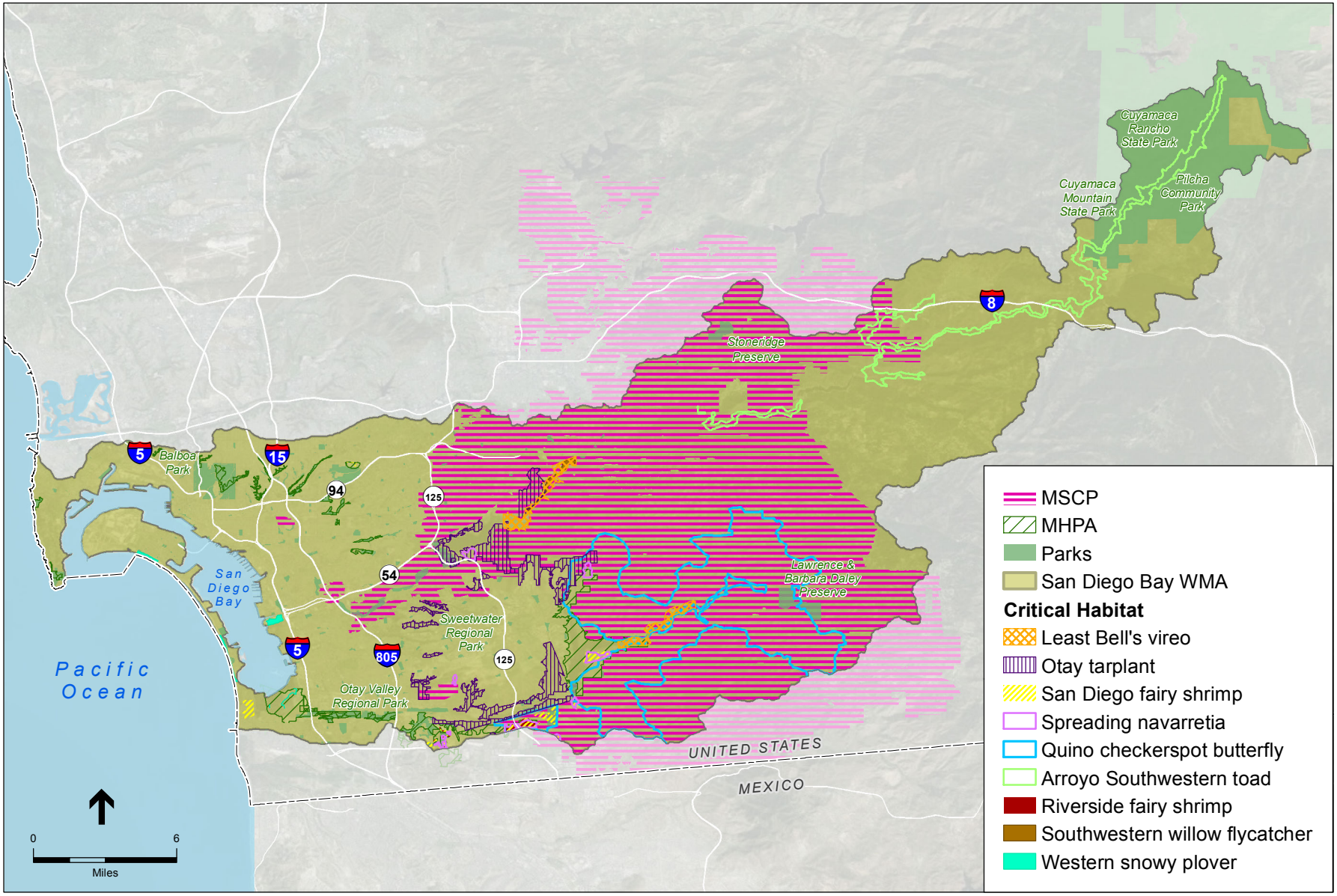


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-48

Water Agencies and Wastewater Agencies within the San Diego Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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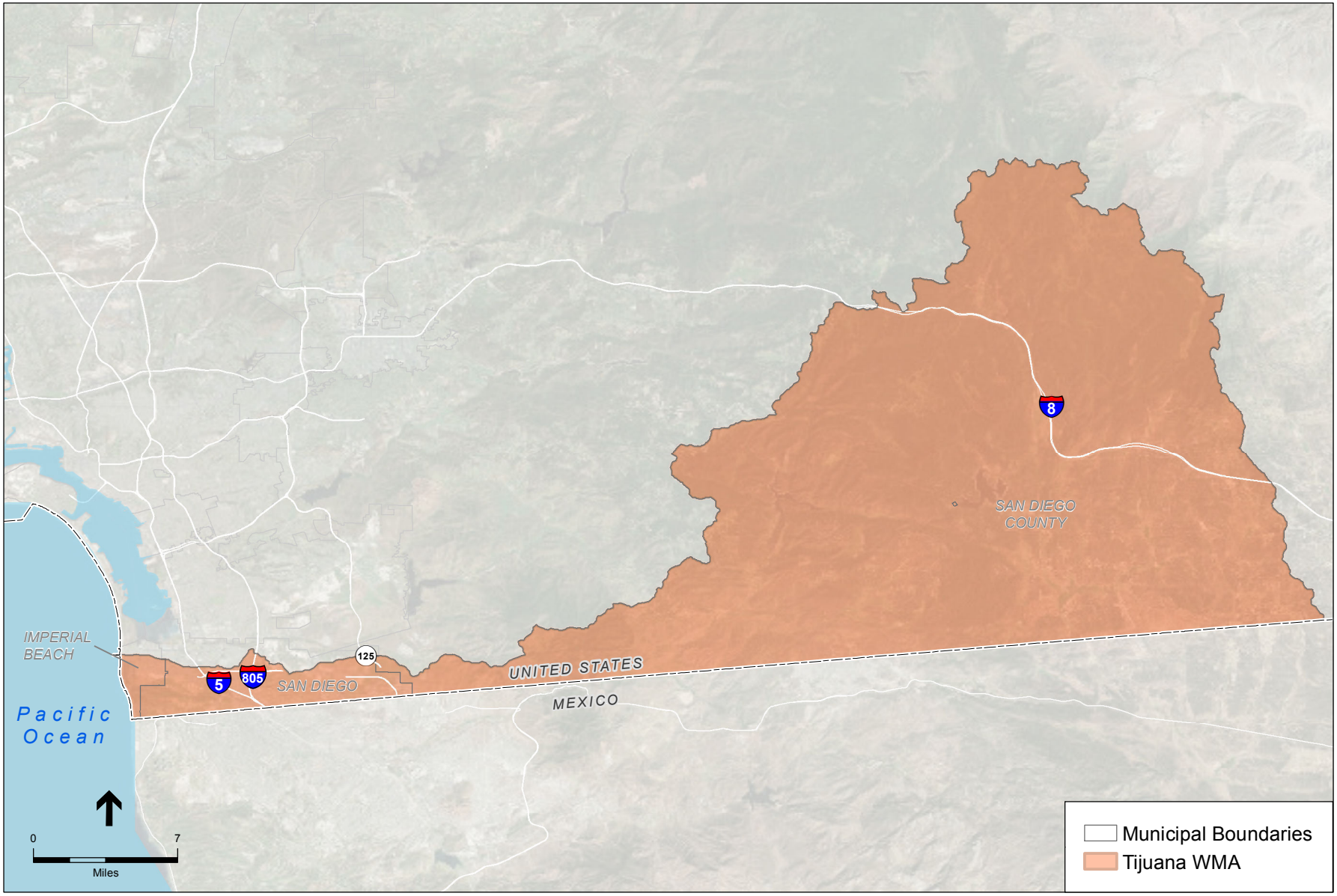
Figure 3-49

Critical Habitat within the San Diego Bay Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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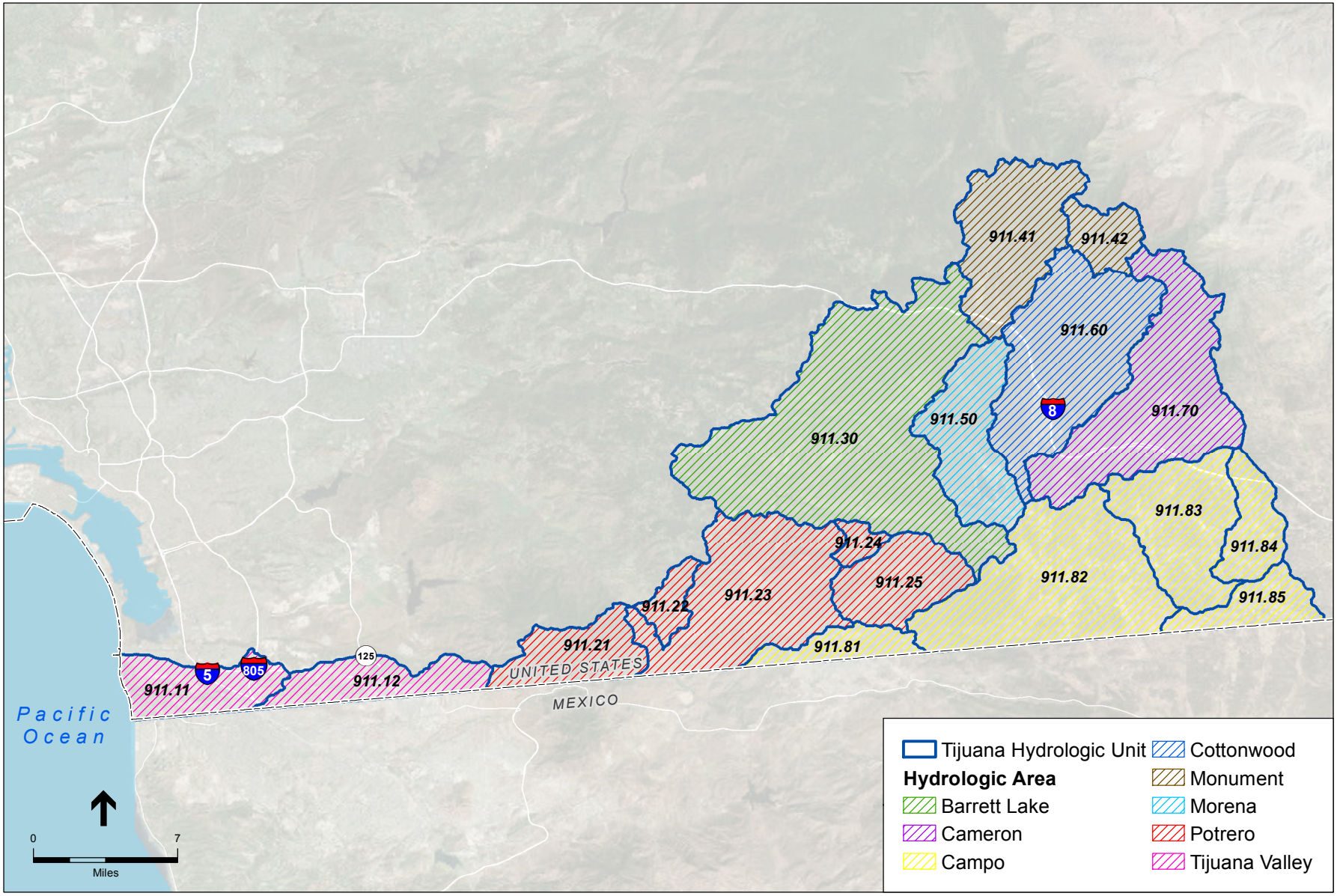
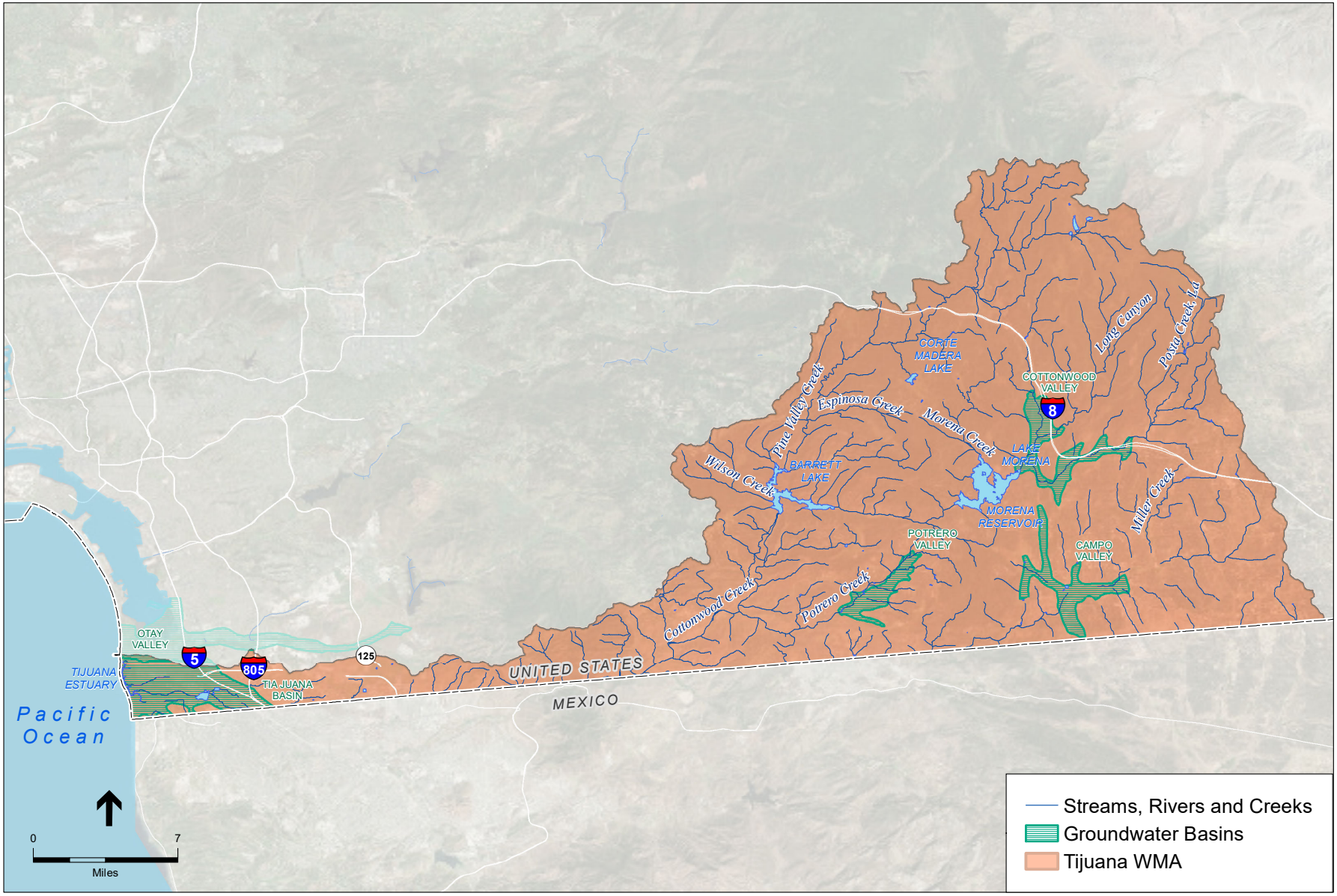
Figure 3-50
City Boundaries within the Tijuana Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-51
Hydrologic Units and Areas within the Tijuana Water Management Area

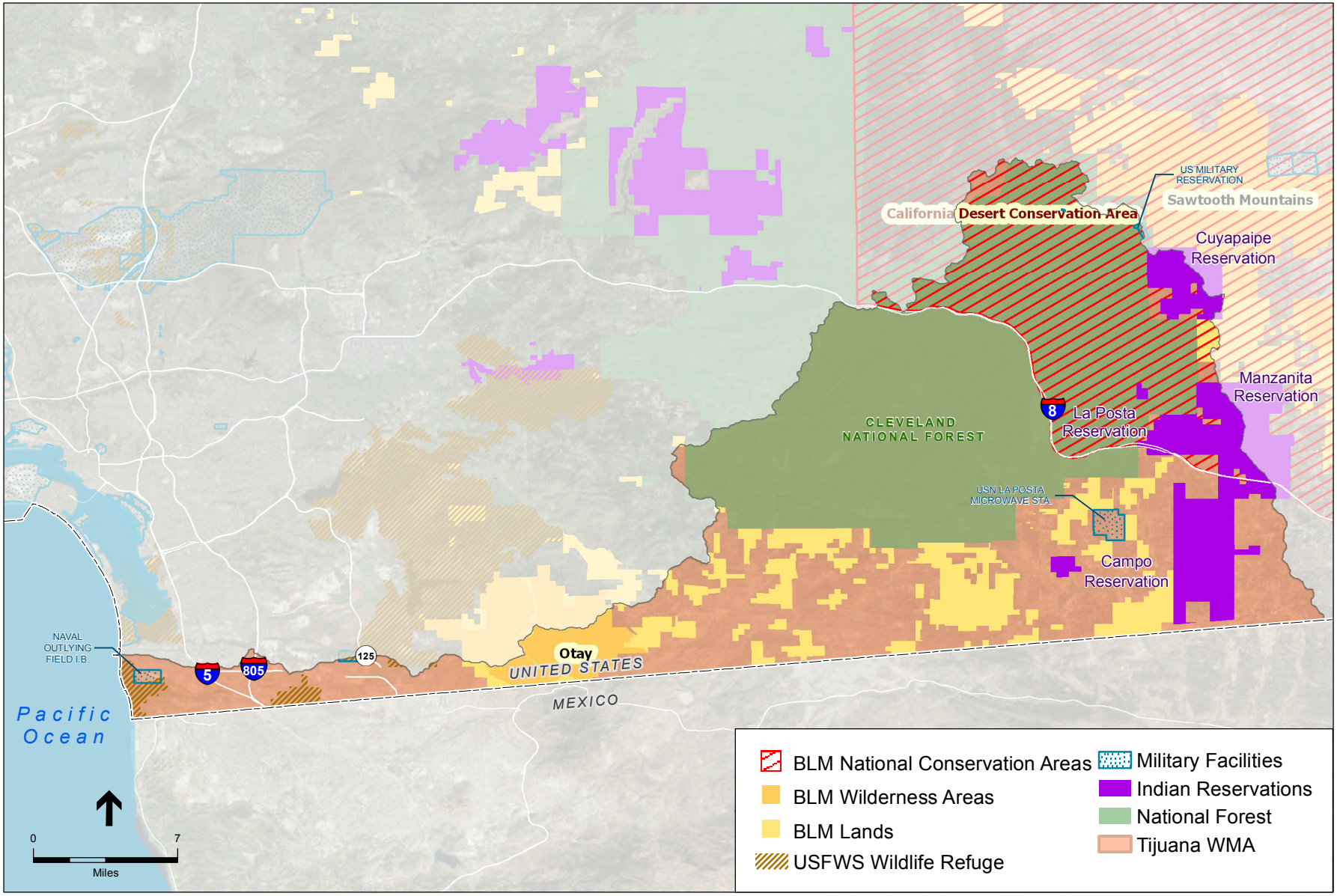


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 3-52

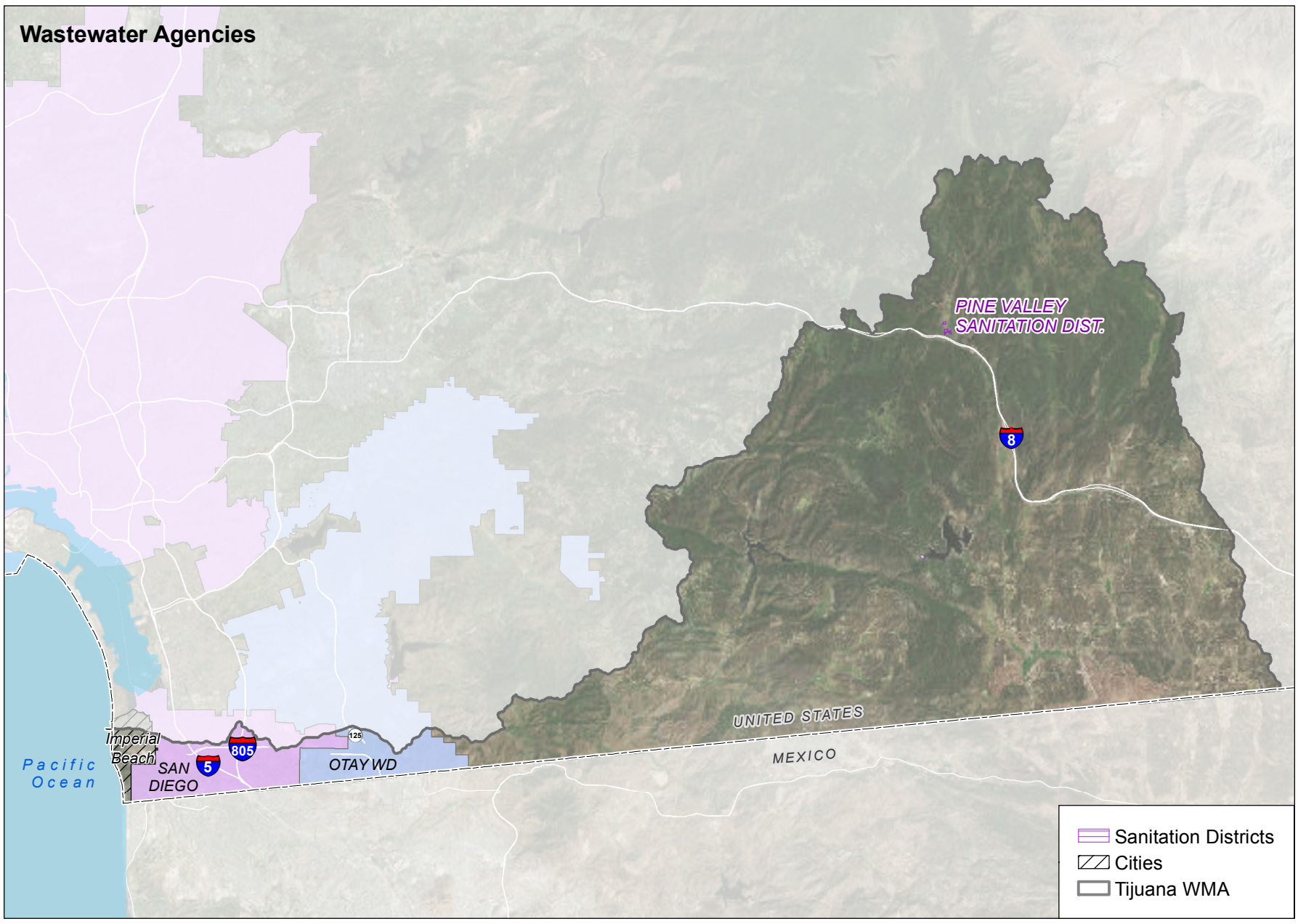
Water Features within the Tijuana Water Management Area

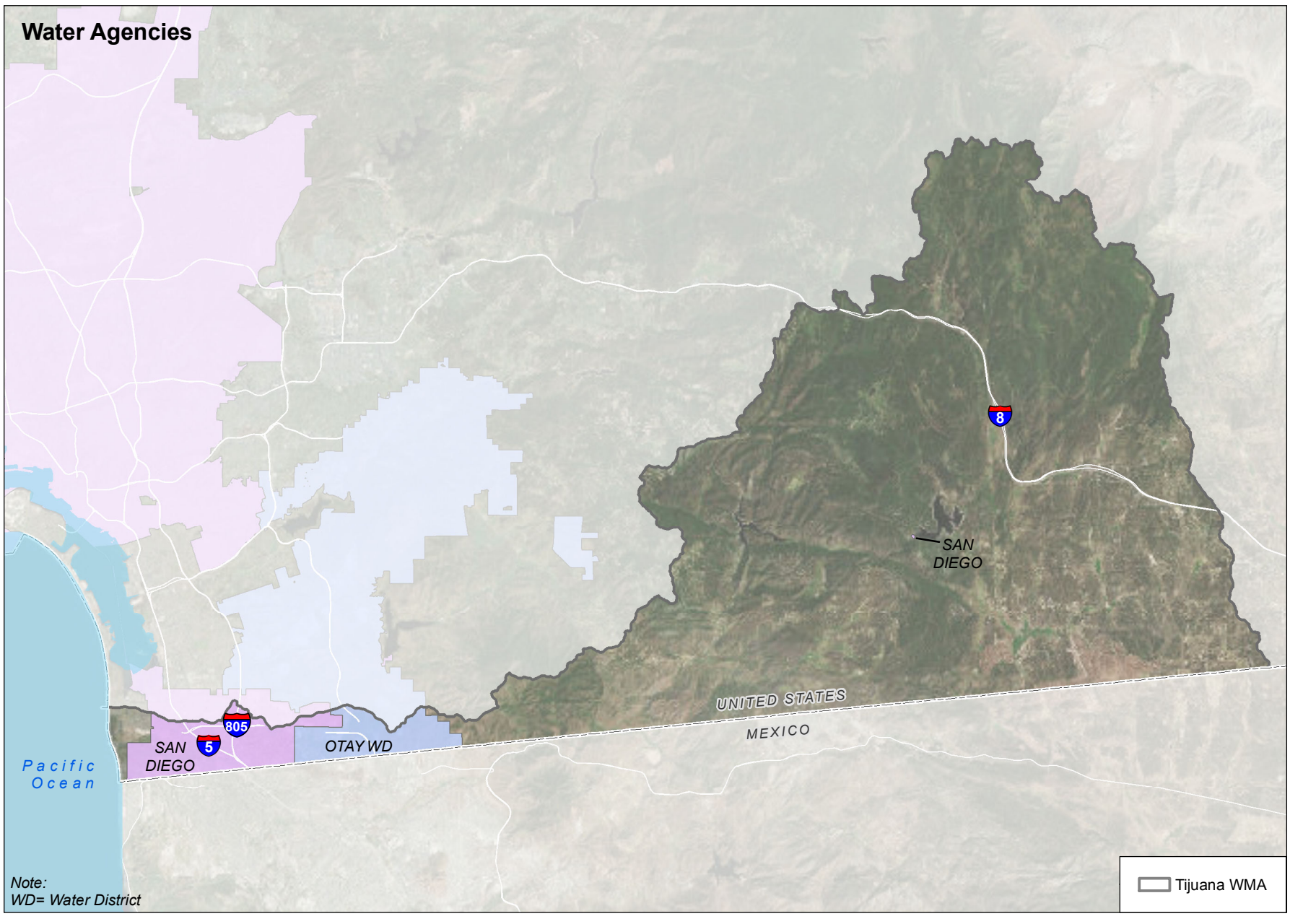


SOURCE: ESRI, 2016; SanGIS, 2016; Bureau of Land Management

SWRP . 160618

Figure 3-53
Land Use Agencies within the Tijuana Water Management Area





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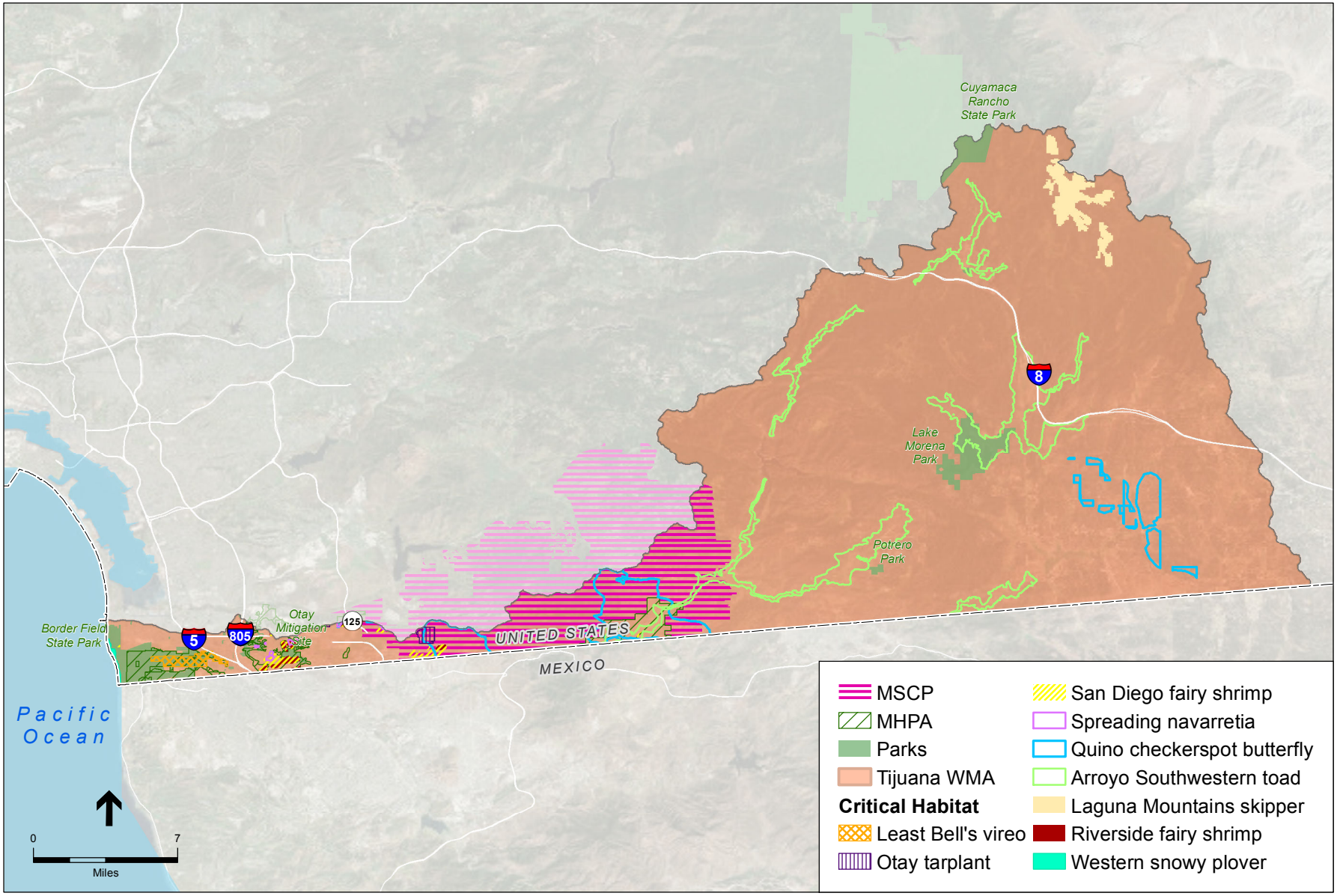
SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

SWRP . 160618

Figure 3-54
Water Agencies and Wastewater Agencies within the Tijuana Water Management Area



SOURCE: ESRI, 2016; SanGIS, 2016

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Figure 3-55
Critical Habitat within the Tijuana Water Management Area

CHAPTER 4
Water Quality Compliance (SWRP Guidelines Section V)

SWRP Checklist Guidelines

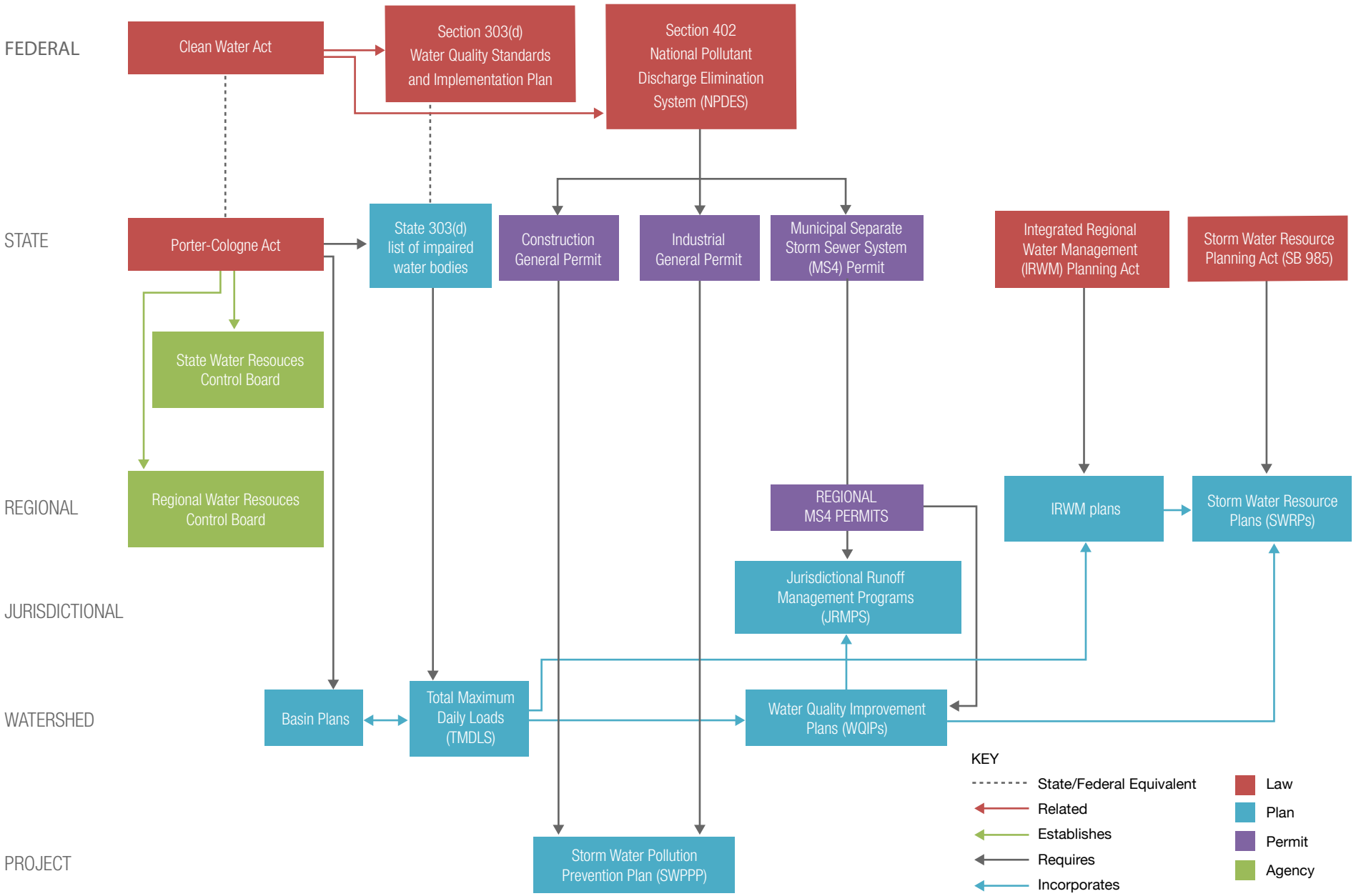
- ☒ Plan identifies activities that generate or contribute to the pollution of storm water or dry weather runoff, or that impair the effective beneficial use of storm water or dry weather runoff.
- ☒ Plan describes how it is consistent with and assists in, compliance with total maximum daily load implementation plans and applicable national pollutant discharge elimination system permits.
- ☒ Plan identifies applicable permits and describes how it meets all applicable waste discharge permit requirements.

This chapter discusses the compliance of the SWRP with other water quality regulations for the County of San Diego. Regulatory authorities exist on the federal, state, and regional levels for the protection of water quality in California. With regard to water quality management responsibilities, the USEPA is the federal agency pursuant to the Clean Water Act, and the SWRCB is the state agency pursuant to the Porter-Cologne Act. The SDRWQCB implements water quality regulations throughout the San Diego Region, including the County of San Diego areas.

Figure 4-1 provides a flow chart of California water quality legislation, the associated permits reflecting this legislation, and required plans for compliance with these permits. Background on these permits and plans is described in Section 4.1 of this chapter. Section 4.2 summarizes the different activities within San Diego County that generate or contribute to the pollution of storm water or dry weather runoff organized by WMA.

4.1 Applicable Permits and Plans

The purpose of the Clean Water Act is to protect and maintain the quality and integrity of the nation's waters by requiring states to develop and implement state water plans and policies. California implemented the Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) in 1969. The Porter-Cologne Act established the SWRCB and divided California into nine regions, each overseen by a RWQCB, such as the SDRWQCB. The Clean Water Act and the Porter-Cologne Act established several permits and plans, including the Water Quality Control Plans (basin plans) and the NPDES, as discussed below.



SOURCE: ESA

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Figure 4-1
California Water Quality Legislation

4.1.1 Basin Plans and Impaired Water Bodies

The nine RWQCBs within the state are responsible for adoption and implementation of basin plans, issuance of waste discharge requirements, and performing other functions concerning water quality control within their respective regions, subject to SWRCB review or approval (SDRWQCB, 2012). According to California Water Code Section 13050, basin plans establish the beneficial uses to be protected for the waters within a specified area, water quality objectives to protect those uses, and an implementation program for achieving the objectives. This SWRP incorporates the water quality objectives listed in the SDRWQCB Basin Plan.

Under Section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. Impaired waters are waters that do not meet water quality standards identified in the basin plan for that region, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish a priority ranking for listed waters and develop TMDL action plans to improve water quality. TMDLs are described in Section 4.1.2 below.

4.1.2 Total Maximum Daily Loads

The Clean Water Act Section 303(d) requires states to identify waters that do not meet certain water quality standards and develop TMDLs for them. Additionally, TMDLs are programs for implementation of existing water quality standards and are established in the Regional Basin Plan subject to the requirements of the California Water Code Section 13242.

A TMDL is a quantitative assessment of water quality problems, contributing sources, and load reductions or control actions needed to restore and protect bodies of water. The TMDL approach provides a framework for evaluating pollution control efforts and for coordination between federal, state, and local efforts to meet water quality standards. TMDLs are adopted as amendments to the region's basin plan (SDRWQCB, 2016a).

A TMDL project may consist of a single water body and pollutant or a combination of multiple water bodies and pollutant listings to restore impaired water bodies (SDRWQCB, 2016b). SDRWQCB works collaboratively with stakeholder groups to address its impaired water bodies and define TMDLs. The development steps include assessing the water body, defining total loads, developing allocations, and implementation plans to address the water quality impairment(s) (SDRWCB, 2016c).

Table 4-1 below lists the TMDLs that have been adopted within the San Diego Region, along with their adoption date.

TABLE 4-1
TMDLS ADOPTED BY SDRWQCB FOR THE SAN DIEGO REGION

Adopted TMDLs	Adoption Date
Chollas Creek Diazinon TMDL	August 14, 2002
Rainbow Creek Nitrogen and Phosphorus TMDLs	February 9, 2005
Shelter Island Yacht Basin Dissolved Copper TMDL	February 9, 2005
Chollas Creek Copper, Lead and Zinc TMDLs	June 13, 2007
Indicator Bacteria: Revised Project I – Twenty Beaches and Creeks in San Diego Region (including Tecolote Creek)	February 10, 2010
Indicator Bacteria: Project II – Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay	June 11, 2008
Los Peñasquitos Lagoon Sediment TMDL	June 13, 2012
Adopted Alternative Approach TMDL	**Adoption Date**
Loma Alta Slough TMDL Phosphorus	June 26, 2014

SOURCE: SDRWQCB, 2016b

There are many TMDL projects that are currently under development. Table 4-2 below lists the TMDLs that are in the process of being developed for the San Diego Region.

TABLE 4-2
TMDLS IN PROGRESS FOR THE SAN DIEGO REGION

Proposed TMDLs
San Diego Bay Marine Sediments TMDLs: • Mouth of Chollas Creek • Seventh Street Channel (Paleta Creek) • Switzer Creek • B Street/Broadway Piers • Downtown Anchorage • Naval Station Submarine Base
TMDLs for Impaired Lagoons, Adjacent Beaches, and Agua Hedionda Creek
Tijuana River and Estuary
Famosa Slough
Santa Margarita River Estuary

SOURCE: SDRWQCB, 2016c.

This SWRP incorporates the TMDLs for the San Diego Region.

4.1.3 National Pollutant Discharge Elimination System Permits

In 1972, the Clean Water Act was amended to state that discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with a NPDES permit (SWRCB, 2013). General permits establish essential regulatory requirements for a broad range of activities. NPDES permits that apply to the San Diego Region include the Construction General Permit, the Industrial General Permit, and the MS4 Permit. These permits are described in more detail below.

4.1.3.1 Construction General Permit

Construction projects (or projects that are part of a larger development plan) that disturb one or more acres of ground surface must obtain coverage under the Construction General Permit (2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). Compliance with the Construction General Permit requires the preparation and implementation of a project-specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP describes which BMPs will be implemented on site, where they will be located to prevent pollutants from contacting storm water, and how they will impede polluted runoff from moving off site into receiving waters. Categories of BMPs include erosion control, sediment control, waste management, good housekeeping, and post-construction. The SWPPP must also detail any pertinent monitoring and sampling requirements to be performed throughout the construction period, which are identified in the Construction General Permit and are dependent on the sediment and receiving water risk level of the site. Compliance with the Construction General Permit is implemented and enforced by SWRCB, which runs the Storm Water Multiple Application and Report Tracking System website, where storm water permit documents are electronically filed. SWRCB also processes all Notice of Intent documents prepared by projects intending to comply with the Construction General Permit (SDRWQCB, 2016d). Projects evaluated and prioritized by this SWRP disturbing more than an acre of ground surface would be required to comply with the Construction General Permit requirements.

4.1.3.2 Industrial General Permit

SWRCB adopted the most recent version of the Industrial General Permit in July 2015 (Order 2014-0057-DWQ). The purpose of this permit is to protect water quality during industrial operations. A SWPPP must be prepared that includes BMPs to be implemented throughout the site operation. BMPs must include all minimum BMPs identified in the Industrial General Permit that are required for all facilities, along with any applicable advanced BMPs. The SWPPP also requires monitoring. Minimum BMP types include good housekeeping, preventative maintenance, spill and leak prevention and response, material handling and waste management, erosion and sediment control, quality assurance, and record keeping. Operation of industrial facilities must comply with discharge prohibitions, effluent limitations, receiving water limitations, and TMDLs for receiving waters. Monitoring and receiving water sampling requirements for the facility must also be detailed in the SWPPP. The Industrial General Permit requires each facility to have a Pollution Prevention Team established and responsible for assisting with the implementation of the requirements in the Permit (SWRCB, 2014).

Projects evaluated and prioritized by this SWRP would be required to comply with the Industrial General Permit if they involve industrial operations as identified by the permit, although this is not expected for the types of projects that are typically used to address storm water.

4.1.3.3 San Diego Municipal Separate Storm Sewer System (MS4) Permit

The San Diego Region's MS4 Permit (Order No. R9-2013-001, as amended by Order Nos R9 2015-001 and R9 2015-011) is designed to regulate discharges from municipal separate storm sewer systems. The MS4 Permit covers 39 municipal, county government, and special district entities (referred to jointly as Copermittees) located in San Diego County, southern Orange County, and southwestern Riverside County who own and operate large MS4s, which discharge storm water (wet weather) runoff and non-storm water (dry weather) runoff to surface waters (SDRWQCB, 2015).

The MS4 Permit includes minimum BMPs required for commercial, industrial, municipal, and residential operations. The Permit also requires inspection of BMPs. Additionally, each development project must implement, where applicable and feasible, low impact development (LID) BMPs to mimic the natural hydrology of the site and retain and/or treat pollutants in storm water runoff prior to discharging to and from the MS4 (SDRWQCB, 2015). The San Diego Low Impact Development Design Manual details various LID BMPs and provides guidance on how to select them (CSD, 2011a).

The MS4 Permit requires the preparation of WQIPs for each WMA. The goal of the WQIPs is to guide the Copermittees' jurisdictional runoff management programs towards achieving the outcome of improved water quality in MS4 discharges and receiving waters. WQIPs must identify the highest priority water quality conditions and sources of pollutants or stressors. To identify the water quality priorities within each watershed addressed by their WQIP, the responsible agencies within each WMA considered various factors. These factors included but are not limited to: receiving waters listed as impaired on the Clean Water Act Section 303(d) List, TMDLs adopted and under development by the SDRWQCB, sensitive or highly valued receiving waters, and monitoring data. Following identification of highest priority water quality conditions, water quality improvement goals and strategies must be developed to address these conditions (SDRWQCB, 2015).

The MS4 Permit requires implementation of the Jurisdictional Runoff Management Programs (JRMPs) in accordance with the strategies identified in the WQIPs. The goal of JRMPs is to effectively prohibit non-storm water discharges to the MS4 and reduce the discharge of pollutants in storm water to the maximum extent possible (SDRWQCB, 2015). A list of entities within the San Diego Region that have developed JRMPs and the corresponding watersheds is provided in Table 4-3 below.

TABLE 4-3
JRMPS WITHIN THE SAN DIEGO REGION

Jurisdiction	Watershed
City of Carlsbad	Carlsbad
City of Chula Vista	San Diego Bay
City of Coronado	San Diego Bay
City of Del Mar	San Dieguito River, Los Peñasquitos
City of El Cajon	San Diego River
City of Encinitas	Carlsbad
City of Escondido	Carlsbad, San Dieguito River
City of Imperial Beach	San Diego Bay, Tijuana River
City of La Mesa	San Diego Bay
City of Lemon Grove	San Diego Bay
City of National City	San Diego Bay
City of Oceanside	San Luis Rey River, Carlsbad
City of Poway	San Dieguito River; Los Peñasquitos
City of San Diego	San Dieguito River; Los Peñasquitos; Mission Bay; San Diego River; San Diego Bay; Tijuana River
City of San Marcos	Carlsbad
City of Santee	San Diego River
City of Solana Beach	Carlsbad; San Dieguito River
City of Vista	San Luis Rey River; Carlsbad
County of San Diego	All
San Diego County Regional Airport Authority	San Diego Bay
San Diego Unified Port District	San Diego Bay

SOURCE: PCW, 2016

4.2 Pollutant-Generating Activities

Per MS4 Permit requirements, the WQIP prepared for each WMA within the San Diego Region identifies facilities, areas, and activities responsible for generating the highest priority water conditions within that WMA. The WQIPs also recognize and identify principal pollutant sources outside of the responsible agencies' jurisdictions that are sources for pollutants in the WMAs. These include:

- Other permitted discharges
- Other potential point sources[1]
- Other nonpoint sources[2]

1 Point sources are discrete conveyances, such as pipes or ditches.

2 Nonpoint sources typically flow over land and discharge to receiving waters over a broad area, as opposed to a point location.

- Phase II MS4[3] outfalls

Other permitted discharges include those permitted under the Industrial General Permit (Section 4.1.3.2) and Construction General Permit (Section 4.1.3.1). The following sections identify the highest priority water quality conditions and the pollutant-generating facilities, areas, and facilities for each of the nine WMAs in the San Diego Region. The information in each of these sections was adapted from each WMA's respective WQIP.

4.2.1 Santa Margarita River

Although the Santa Margarita River WMA WQIP is still in development, pollutant-generating activities for the WMA are available through other documents. Several of the water bodies in the WMA are impaired by eutrophication, nitrogen, and phosphorus, likely from nutrient applications from agriculture, nursery operations, municipal wastewater discharges, urban runoff, and septic systems. In addition to nutrient-related concerns, other water quality concerns within the watershed include excessive sedimentation, groundwater degradation and contamination, habitat loss, channelization, flooding, and scour (erosion).

4.2.2 San Luis Rey River

The San Luis Rey River WMA WQIP (LWA, 2016a) identified bacteria as the highest priority water quality condition for storm water or dry weather runoff for the San Luis Rey River watershed. Other general potential pollutant sources for the San Luis Rey River watershed include 1) parks, recreational, and open space areas, 2) landfills and other treatment facilities for municipal waste, and 3) tribal lands, federal lands, state parks, and lands regulated by State Board Phase II permits. It should be noted that there is very limited data available to identify potential pollutants in the watershed due to the monitoring locations. These monitoring locations do not represent a single land use type and thus, cannot be used to distinguish pollutant sources (LWA, 2016a).

The number of potential pollutant-generating facilities, areas, and activities within each jurisdiction of the San Luis Rey River watershed is shown in Table 4-4 below.

[3] Phase II MS4s are smaller agencies (relative to municipalities) or areas that are regulated under the State's Phase II MS4 General Permit (State Board Order No. 2013-0001-DWQ) (SDRWQCB, 2013). They are outside the authority of the responsible agencies and, within the San Diego region can include, but are not limited to, correctional, transit, educational, and federal facilities. Phase II MS4 permittees are responsible only for the runoff from their facilities and activities, whereas the responsible agencies are responsible for receiving runoff from other sources.

TABLE 4-4
POTENTIAL POLLUTANT-GENERATING FACILITIES IN WATERSHED

Land Use	City of Vista	City of Oceanside	County of San Diego
Commercial Sites	537	1,085	340
Industrial Sites	181	59	8
Construction Sites	29	0	1,406
Parks/Recreation	1,250 acres	20 parks, 3 marinas	9 parks
Landfill Site	None	1 inactive site	2 inactive sites

SOURCE: LWA, 2016a (Table 2-16)

4.2.2.1 Bacteria

Bacteria are a primary source of pollutants in the storm drain system of the San Luis Rey River watershed. Potential pollutant sources for bacteria are listed in Table 4-5 below.

TABLE 4-5
POTENTIAL POLLUTANT BACTERIA SOURCES

General Source Categories	Targeted Source Categories
• Construction • Commercial • Industrial • Municipal Parks and Recreation Areas • Municipal Burn Sites and Landfills • Residential	• Food Establishments • Commercial Animal Facilities • Nurseries • Residential Land Uses • Agricultural Land Uses • Human Sources (sewer infrastructure, on-site wastewater treatment systems, homeless encampments)

SOURCE: LWA, 2016a (Table 2-18)

The highest rated potential sources of human-related bacteria for dry and wet weather include: sanitary sewer overflows, leaking sewer pipes, homeless populations, and leaking septic systems. Sanitary sewer overflows typically occur during dry weather and are usually episodic events. During these events, leaking sewer pipes and aging infrastructure can allow water to flow outside of the intended conveyance and increase potential for cross-contamination if located near storm drains or receiving waters. Similarly, failing septic systems typically contribute to bacteria loads to the MS4 and receiving waters, and can occur during dry weather.

4.2.3 Carlsbad

The Carlsbad WMA WQIP (MOE, 2016) identified pesticides, bacteria, sedimentation, riparian habitat degradation, and hydromodification impacts as the highest priority conditions for storm water and dry weather runoff in the Carlsbad WMA. Specifically, riparian habitat degradation is the highest priority water quality condition for the Agua Hedionda and Escondido hydrologic area. The six HAs in the Carlsbad WMA have distinct pollutant sources. Table 4-6 below shows the number of pollutant-generating facilities and sites within each HA.

TABLE 4-6
MS4 POLLUTANT GENERATING SOURCES PER HA[a]

Pollutant Generating Sources	Loma Alta HA	Buena Vista Creek HA	Encinas HA	San Marcos HA
Aggregates/Mining	0	1	0	1
Agriculture	0	1	4	0
Animal Facilities	10	5	5	45
Auto Repair, Fueling, or Cleaning	92	131	67	136
Auto Parking Lots or Storage	6	16	27	4
Auto Body Repair or Painting	28	19	12	48
Nurseries/Greenhouses	4	28	59	96
Building Materials Retail	2	0	2	30
Chemical and Allied Products	4	0	4	4
Concrete Manufacturing	6	1	0	4
Eating or Drinking Establishments	123	391	162	501
Equipment Repair or Fueling	14	8	40	87
Fabricated Metal	17	6	42	39
Food Manufacturing	8	3	21	30
General Contractors	54	26	51	129
General Industrial	62	10	98	76
General Retail	125	94	58	65
Health Services	0	2	0	1
Institutional	6	2	0	0
Mobile Landscaping	0	0	0	0
Motor Freight	12	3	10	23
Offices	70	36	0	2
Parks and Rec (including Golf, Cemetery)	1	3	4	9
Pest Control Services	6	1	4	1
Pool and Fountain Cleaning	2	1	0	5
Publicly owned treatment works	0	0	1	3
Primary Metal	8	0	5	1
Recycling & Junk Yards	0	2	6	4
Roads, Streets & Parking, Freeways, Railways	0	0	0	1
Stone/Glass Manufacturing	8	3	10	10
Storage/Warehousing	14	9	48	108
Municipal	34	81	69	119
Residential (acres)	2,025	7,345	6,613	12,977

a. The quantities in this table represent current data at the time of the WQIP's publication. These quantities are subject to change given the high turnover of facilities in the hydrologic area.

SOURCE: MOE, 2016 (Tables 23, 28, 35 and 39)

4.2.4 San Dieguito River

The San Dieguito River WMA WQIP (AMEC, 2015a) identified bacteria as the highest priority condition for storm water and dry weather runoff in the San Dieguito River WMA. According to the WQIP, the highest priority MS4 sources potentially contributing bacteria are residential areas and sanitary sewer overflows/septic systems. The likely sources for causing bacteria impairments are shown in Table 4-7 below. Sources of bacteria according to land uses are summarized in Table 4-8.

TABLE 4-7
LIKELY SOURCES OF BACTERIA IN SAN DIEGUITO RIVER WMA[a]

Source	Land Use Category	Number of Identified Likely Sources
Agriculture	Other	2 facilities
Animal Facilities	Commercial	49 facilities
Eating or Drinking Establishments	Commercial	420 facilities
Mobile Landscaping	Commercial	3 facilities
Nurseries and Greenhouses	Commercial	34 facilities
Roads, Streets and Parking	Municipal	2 facilities
Residential Areas	Residential	38,988 acres

a. The quantities in this table represent current data at the time of the WQIP's publication. These quantities are subject to change given the high turnover of facilities in the water management area.

SOURCE: AMEC, 2015a (Table 3-1)

Other potential sources have been identified that may contribute to the bacteria impairment within the San Dieguito River WMA but are outside of the jurisdiction of the Responsible Parties. These sources are transferred to receiving waters by the Responsible Agencies' MS4s, and include: Phase II MS4 outfalls (Del Mar Fairgrounds and North County Transit District), other permitted discharges, other potential point sources, and other nonpoint sources.

TABLE 4-8
SOURCES OF BACTERIA IN THE SAN DIEGUITO RIVER WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreational Areas	Open Space	Landfills	Other
By Facility									
Nurseries and Greenhouses		✓		✓		✓			✓
Eating and Drinking Establishments		✓		✓		✓			✓
Animal Facilities		✓		✓					✓
By Area									
Agriculture				✓	✓				✓
Roads, Streets, Parking Areas		✓	✓	✓		✓			✓
Residential Areas					✓				✓
By Activity									
Mobile Landscaping		✓		✓	✓	✓			
Other									
Bacteria Regrowth and Biofilms				✓					✓
Transient Encampments									✓
Sanitary Sewer Overflows and Septic Systems	✓	✓	✓	✓	✓	✓			✓
Wildlife				✓		✓	✓	✓	✓

SOURCE: AMEC, 2015a (Table 3-3)

4.2.5 Los Peñasquitos

The Los Peñasquitos WMA WQIP (AMEC, 2015b) identified freshwater discharge, hydromodification, sediment, and bacteria as the highest priority conditions for storm water and dry weather runoff in the Los Peñasquitos WMA.

4.2.5.1 Freshwater

Freshwater discharge has a more significant impact during dry weather than wet weather since historically the creeks in the Los Peñasquitos WMA did not run at all during dry weather. Table 4-9 summarizes the sources of freshwater discharge in the Los Peñasquitos WMA.

TABLE 4-9
SOURCES OF FRESHWATER DISCHARGE IN THE LOS PEÑASQUITOS WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreational Areas	Open Space	Landfills	Other
Outfalls with Persistent Dry Weather Flow		✓	✓	✓	✓				✓
Irrigation Runoff				✓		✓			
Parks and Recreation (including golf courses and cemeteries)				✓		✓			✓
Roads, Streets, Highways, and Parking		✓		✓	✓				✓
Residential Areas									
Sanitary Sewer Overflow	✓	✓	✓	✓	✓	✓			✓

SOURCE: AMEC, 2015b (Table 3-3)

4.2.5.2 Hydromodification

The sediment TMDL states that hydromodification has a more significant impact during wet weather than dry weather. With the increase of impervious surfaces in the watershed, less storm water can infiltrate into the ground, and more is instead directed to natural waterways or the MS4s. This means that the peak (and total) flow in the creeks is greater and occurs more rapidly than under undeveloped conditions (with fewer impervious surfaces). Table 4-10 summarizes the sources of hydromodification in the Los Peñasquitos WMA.

TABLE 4-10
SOURCES OF HYDROMODIFICATION IN THE LOS PEÑASQUITOS WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreational Areas	Open Space	Landfills	Other
Land Development	✓	✓	✓	✓	✓				✓
Impervious Surfaces	✓	✓	✓	✓	✓				✓
Outfalls Discharging to Canyons/Bluffs		✓	✓	✓	✓				✓
Open Space Areas							✓		✓
Flood Control Basins				✓					
Channel Drop Structures				✓					

SOURCE:AMEC, 2015b (Table 3-3)

4.2.5.3 Sediment

The sediment TMDL states that sources of sediment are more significant in wet weather than in dry weather. Hydromodification can cause significant erosion in the natural drainages and canyon walls, as well as within creek beds, banks, and floodways, as the geomorphology shifts to transport the larger flow. The higher peak flows possess greater energy, which can mobilize greater amounts and sizes of sediment. Table 4-11 summarizes the sources of sediment in the Los Peñasquitos WMA.

TABLE 4-11
SOURCES OF SEDIMENT IN THE LOS PEÑASQUITOS WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreational Areas	Open Space	Landfills	Other
By Facility									
Aggregates/Mining			✓						✓
Animal Facilities		✓		✓					✓
Building Materials Retail		✓				✓			
Nurseries and Greenhouses		✓	✓	✓					✓
Health Services		✓		✓					
Recycling and Junk Yards			✓	✓				✓	
Stone/Glass Manufacturing			✓						
Storage/Warehousing	✓	✓	✓	✓					✓
By Area									
Agriculture				✓	✓				✓
Auto Parking Lots or Storage	✓	✓		✓	✓	✓			✓
General Retail		✓							
Municipal	✓			✓	✓	✓	✓	✓	
Residential Areas					✓				
By Activity									
Concrete Manufacturing	✓		✓						
Construction	✓								
General Contractors	✓								
Mobile Landscaping		✓		✓	✓				
Other									
Hydromodification	✓	✓	✓	✓	✓	✓			✓
Ocean Sediment Contribution						✓			✓
Open Space Areas							✓		
Roads, Streets, Highways, and Parking		✓		✓	✓				✓

SOURCE: AMEC, 2015b (Table 3-3)

4.2.5.4 Bacteria

The bacteria TMDL states that sources of bacteria may be the same in wet and dry weather, however, the transport mechanisms are different. During storm events, bacteria are discharged to the MS4 over a general area, which receives rainfall and which can be well represented by land use. During dry weather, bacteria are conveyed by illicit discharges, irrigation runoff, infiltration, and permitted discharges. Table 4-12 provides the sources of bacteria in the Los Peñasquitos WMA.

TABLE 4-12
SOURCES OF BACTERIA IN THE LOS PEÑASQUITOS WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreational Areas	Open Space	Landfills	Other
By Facility									
Animal Facilities		✓		✓					✓
Eating and Drinking Establishments		✓		✓		✓			✓
Nurseries and Greenhouses		✓	✓	✓		✓			✓
By Area									
Residential Areas									
Agriculture									
By Activity									
Mobile Landscaping									
Other									
Bacteria Regrowth and Biofilms				✓					✓
Transient Encampments									✓
Open Space Areas							✓		
Sanitary Sewer Overflows	✓	✓	✓	✓	✓	✓			✓
Wildlife				✓		✓	✓	✓	✓

SOURCE: AMEC, 2015b (Table 3-3)

4.2.5.5 Other Sources

Other potential sources have been identified that may contribute to the impairment within the Los Peñasquitos WMA, including Phase II MS4 outfalls (Marine Corps Air Station Miramar, North County Transit District (NCTD), and the University of California, San Diego), other permitted discharges (Table 4-13), other potential point sources, and other nonpoint sources.

TABLE 4-13
STORM WATER DISCHARGE PERMITS

Permit Type	Number of Permits in WMA
Municipal Storm Water	5
Industrial Storm Water	75
Construction Storm Water	46
Caltrans Storm Water	1
Other Individual NPDES Discharges	0
Total	127

SOURCE: AMEC, 2015b (Table 3-2)

4.2.6 Mission Bay

The Mission Bay WMA WQIP (AMEC, 2016) identified bacteria and sediment as the highest priority pollutants in its WMA. Table 4-14 lists the likely sources of bacteria and sediment within the Mission Bay WMA.

TABLE 4-14
LIKELY SOURCES OF BACTERIA AND SEDIMENT

Source Type	Category	Total Number of Sources in WMA	Bacteria	Sediment
Agriculture	Other	2 (80 acres)	-	✓
Animal Facilities	Commercial	77	✓	-
Construction	Construction	N/A	-	✓
Eating/Drinking Establishments	Commercial	1,281	✓	-
Golf Courses/Parks	Municipal	14	✓	✓
Home and Garden Care	Residential	11,463 acres	✓	✓
Hydromodification	Construction	N/A	-	✓
Landscaping	Commercial	32	✓	✓
Land Use Alteration	Construction	N/A	-	✓
Mobile eating/Drinking Establishments	Commercial	2	✓	-
Mobile Landscaping	Commercial	205	✓	✓
Nurseries/Greenhouses	Commercial	7	-	✓
Publicly Owned Treatment Works (POTWs)	Municipal	1	✓	-
Waste Disposal	Municipal	3	✓	-

Sources are quantified by facility counts or acreage. Facility counts help define the sources during dry weather and land uses help defines sources during wet weather.
N/A = not available. The number of sources is either variable, as with construction, or is not currently assessed by the jurisdiction because of the difficulty in obtaining an accurate count.
"✓" = Source applies to highest priority water quality condition. "–" = Source does not apply to highest priority water quality condition.

SOURCE: AMEC, 2016 (Table 3-1)

Other potential sources have been identified that may contribute to the impairment within the Mission Bay WMA, including Phase II MS4 outfalls (Marine Corps Air Station Miramar, NCTD, Veterans Administration San Diego Healthcare System, and the University of California, San Diego), other permitted discharges (Table 4-15), other potential point sources, and other nonpoint sources

TABLE 4-15
STORM WATER DISCHARGE PERMITS

Permit Type	Numbers of Permits[a]
Municipal Storm Water	2
Industrial Storm Water	6[b]
Construction Storm Water	15[b]
Caltrans Storm Water	1
Other Individual NPDES Discharges	4
Total	**28**

a. Number of permits in Tecolote and Scripps subwatersheds only.
b. Number of individual permittees filing under statewide general permit.

SOURCE: AMEC, 2016 (Table 3-2)

During wet weather, storm water runoff may carry bacteria and sediment from agricultural lands to the MS4. The bacteria TMDL identifies wildlife areas, which include open space land uses and are sometimes not under the jurisdiction of Responsible Agencies, as sources of bacteria. The wildlife areas partially account for bacteria contributions from wild animals and decaying plant sources.

During dry weather, bacteria may enter the MS4 or receiving waters through groundwater infiltration or irrigation runoff into municipal drainage channels. Also, groundwater may contribute to the bacteria in the MS4 and receiving waters. The Tecolote Creek Comprehensive Load Reduction Plan (City of San Diego and Caltrans) identifies aerial deposition (i.e., sediment blown and redeposited by wind) as both a natural source and a source influenced by human activity for sediment in the San Diego Region.

4.2.7 San Diego River

The San Diego River WMA WQIP (LWA, 2016b) identified bacteria as the highest priority water quality condition. Table 4-16 provides a summary of the applicable pollutant generating facilities, areas, and activities within each participating agency's boundaries.

TABLE 4-16
SUMMARY OF APPLICABLE POLLUTANT GENERATING FACILITIES, AREAS, AND/OR ACTIVITIES BY JURISDICTION

Potential Pollutant Source Areas	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Construction, Commercial, Industrial, Municipal, Residential Facilities and/or Areas	✓	✓	✓	✓	✓
Publicly Owned Parks and/or Recreational Areas	✓	✓	✓		✓
Open Space Areas	✓	✓	✓		✓
Municipal Landfills or Other Treatment, Storage, or Disposal Facilities for Municipal Waste	✓	✓			
Areas Not within the Copermittee's Jurisdiction	✓	✓			

SOURCE: LWA, 2016b (Table 2-17)

Table 4-17 presents a summary of the number of pollutant generating land uses in the San Diego River WMA.

TABLE 4-17
POLLUTANT GENERATING LAND USES

Land Use	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Construction Sites	288	247	14	28	12
Commercial Sites	493	3,703	540	342	700
Industrial Sites	79		n/a	17	104
Municipal Sites	40	57	17	49	34
Parks/Recreation Areas (in sites or acres)	25 sites	67 sites	279 acres	--	78 acres

SOURCE: LWA, 2016b (Table 3-17)

Some additional sources of pollution identified in the San Diego River WQIP that are naturally present include wildlife, kelp, natural erosion, bacterial regrowth, natural groundwater, and wildfires. Natural sources that can be anthropogenically influenced include groundwater altered by imported water supply, aerial deposition of transportation and industrial pollutants, and erosion exacerbated by hydromodification. Sources specific to bacteria were identified within the watershed including homeless populations living near receiving waters, sludge/sewage disposal sites, and portable bathroom facilities.

4.2.8 San Diego Bay

The San Diego Bay WMA WQIP (SDBRP, 2016) identified indicator bacteria, metals, and trash as the highest priority water quality conditions. Table 4-18 summarizes the facilities and activities identified as known or suspected sources of pollutants and stressors identified for the highest priority conditions for the San Diego Bay WMA.

TABLE 4-18
LIKELY SOURCES OF POLLUTANTS AND STRESSORS

Source Type	Total Number of Facilities in Hydrologic Area[a]	Bacteria	Metals
Agriculture	1	✓	✓
Animal Facilities	82	✓	
Automotive	876		✓
Eating or Drinking Establishments	2,316	✓	
Equipment	91		✓
General Industrial	95		✓
Institutional	68		✓
Manufacturing	57		✓
Metal	40		✓
Nurseries/Greenhouses	18	✓	✓
Stone/Glass Manufacturing	9		✓
Storage/Warehousing	210		✓
Municipal	298		✓
Residential Areas[b]	10,716	✓	✓

✓ = Stressor has been identified for the Highest Priority Condition in the hydrological area.
Blank = Stressor is not identified as a potential source in the WURMP Annual Reports.
a. Total number of facilities in San Diego Mesa HA. Many of these facilities do not drain to the Chollas Creek HSA.
b. Residential areas are reported as acreage and not by the number of dwellings.

SOURCE: SDBRP, 2016 (Table 3-3)

Other potential sources have been identified that may contribute to the impairment within the San Diego Bay WMA, including Phase II MS4 outfalls (Metropolitan Correctional Center San Diego and R.J. Donovan Correctional Facility), other permitted discharges, other potential point sources, and other nonpoint sources. Table 4-19 lists discharge permits within the Pueblo HA of the San Diego Bay WMA. The Pueblo San Diego Watershed contains the most concentrated area of urban land uses and MS4 outlets and outfalls and has the highest priority water quality conditions for bacteria and metals.

The highest relative load contributions of dissolved copper, lead, and zinc have been attributed to freeways and commercial/industrial land uses, which may include both point and nonpoint sources. Brake pad wear on automobiles is a likely nonpoint source of copper, and, to a lesser extent, a source of lead and zinc in the creek. Discharge of drinking water supply has also been identified as a point source of metals, and may partially be contributed to by piping infrastructure. Sediment and groundwater flows have also been identified as nonpoint sources of these metals into the creeks.

TABLE 4-19
DISCHARGE PERMITS

Permit Type	Number of Permits in the Pueblo Hydrologic Area
Municipal Storm Water	1
Industrial Storm Water	93
Construction Storm Water	89
Caltrans Storm Water	1
Other Discharge Permits[a]	5
Total	**189**

a. Includes Order No. R9-2010-0003, R9-2011-0022, 2011-0002-DWQ, 2011-0003-DWQ, and 2011-0004-DWQ. Dischargers may apply for such permits, as necessary.

SOURCE: SDBRP, 2016 (Table 3-2)

4.2.9 Tijuana River

The WQIP for the Tijuana River WMA (URS, 2016) identified sedimentation and siltation in the Tijuana River and turbidity in the Tijuana River and Tijuana River Estuary as the highest priority water quality conditions in the WMA. Segments of both the Tijuana River and the Tijuana River Estuary are identified on the 303(d) list as impaired by sedimentation/siltation or the associated constituent solids, total suspended solids (TSS), and turbidity.

Sediment and turbidity were determined to originate from a range of sources including regulated and unregulated; point and nonpoint; and natural and anthropogenic sources. Anthropogenic sources of sediment occur when storm water runoff rates exceed natural levels in urbanized areas, causing increased stream bank erosion. Other priority water quality conditions that were not selected to be addressed in the Tijuana River WQIP (indicator bacteria, low dissolved oxygen, nutrients, surfactants, TDS, trash, pesticides, synthetic organics, and toxicity) are being addressed by the JRMP. In addition, by addressing sediment, these pollutants often associated with sediment load, will be addressed concurrently.

Table 4-20 lists the inventory of potential pollutant-generating facilities within the Tijuana Valley hydrologic area that may cause or contribute to sedimentation/siltation and turbidity water quality condition in Tijuana River and Tijuana River Estuary in the Lower Watershed. Table 4-21 shows a similar inventory for land uses in the Tijuana Valley hydrologic area.

TABLE 4-20
POTENTIAL POLLUTANT-GENERATING FACILITIES THAT MAY CONTRIBUTE TO THE HIGHEST PRIORITY WATER QUALITY CONDITION

Facility Type	Total
Construction Sites	136
Commercial Facilities	1,444
Industrial Facilities	99
Municipal Facilities	38
Treatment, Storage or Disposal Facilities	20

SOURCE: URS, 2016 (Table 2-12)

TABLE 4-21
POTENTIAL POLLUTANT-GENERATING AREAS THAT MAY CONTRIBUTE TO THE HIGHEST PRIORITY WATER QUALITY CONDITION

Area Type	Total
Areas where the RAs have Oversight and Discharge Responsibility	
Commercial	321
Institutional	139
Low Density Residential	1,373
High Density Residential	577
Transportation[a]	2,291
Vacant and Undeveloped Land	3,403
Open Space Park or Preserve	3,892
Other Park, Open Space and Recreation	126
Areas where the RAs have Oversight Responsibility Only	
Industrial	1,053
Areas where the RAs do not have Oversight or Discharge Responsibility	
Federal Lands[b]	3,162
Caltrans	1,057
Other State Lands[c]	952
School Land	368
Agricultural	1,109

a. Includes local streets and parking lots. Excludes Caltrans.
b. Includes BLM, USFWS, military, and other federal lands
c. Includes California Department of Fish and Game, State Parks, and other state lands.

SOURCE: URS, 2016 (Table 2-13)

Other potential sources have been identified that may contribute to the impairment within the Tijuana River WMA, including other permitted discharges (Table 4-22), other potential point sources, and other nonpoint sources.

TABLE 4-22
NPDES PERMITTED DISCHARGES THAT MAY CONTRIBUTE TO HIGHEST PRIORITY WATER QUALITY CONDITION

Permit Type	Number of Permits in Tijuana River WMA
Industrial	47
Construction	19
Individual permits	2

Includes NPDES permits that may be relevant to sediment: Individual NPDES permit for discharges from Naval Base Coronado, specifically, Naval Outlying Field (NOLF) and discharges from Caltrans sites.

Includes permittees in the Lower Watershed only.

SOURCE: URS, 2016 (Table 2-14)

Potential nonpoint source discharges in the Tijuana River WMA include agricultural operations, erosion related to unimproved roadways in rural areas, homeless encampments, and natural sources.

The Tijuana River main stem and tributary drainages of Yogurt Canyon, Goat Canyon, and Smuggler's Gulch transport anthropogenic-derived sediment and other pollutants generated in Mexico to receiving waters. Both point and nonpoint sources of pollutants are present in the Mexican portion of the watershed.

SWRP Checklist Guidelines

For all analyses:

- ☒ Plan includes an integrated metrics-based analysis to demonstrate that the Plan's proposed storm water and dry weather capture projects and programs will satisfy the Plan's identified water management objectives and multiple benefits.
- ☒ For water quality project analysis (section VI.C.2.a)
- ☒ Plan includes an analysis of how each project and program complies with or is consistent with an applicable NPDES permit. The analysis should simulate the proposed watershed-based outcomes using modeling, calculations, pollutant mass balances, water volume balances, and/or other methods of analysis. Describes how each project or program will contribute to the preservation, restoration, or enhancement of watershed processes (as described in Guidelines section VI.C.2.a)
- ☒ For storm water capture and use project analysis (section VI.C.2.b):
- ☒ Plan includes an analysis of how collectively the projects and programs in the watershed will capture and use the proposed amount of storm water and dry weather runoff.
- ☒ For water supply and flood management project analysis (section VI.C.2.c):
- ☒ Plan includes an analysis of how each project and program will maximize and/or augment water supply.
- ☒ For environmental and community benefit analysis (section VI.C.2.d):
- ☒ Plan includes a narrative of how each project and program will benefit the environment and/or community, with some type of quantitative measurement.
- ☒ Data management (section VI.C.3):
- ☒ Plan describes data collection and management, including: a) mechanisms by which data will be managed and stored; b) how data will be accessed by stakeholders and the public; c) how existing water quality and water quality monitoring will be assessed; d) frequency at which data will be updated; and e) how data gaps will be identified.

CHAPTER 5

Quantitative Methods (SWRP Guidelines Section VI.C) and Identification and Prioritization of Projects (SWRP Guidelines Section VI.D)

To evaluate storm water management on a watershed basis, a combination of storm water management objectives throughout the watersheds and sub-watersheds is required. The objective of this plan is to fully utilize existing watershed and regional planning documents that identify, develop, and prioritize projects, and integrate these plans to "bring to the top" multi-benefit projects that will most effectively meet the watershed goals. This integration of plans and development of multi-benefit projects is achieved through this SWRP by the integrated analysis and prioritization process presented in this chapter.

The scoring and ranking of projects submitted for listing in the SWRP meets the SWRP Guidelines for project prioritization (Section VI.C and VI.D). The project scoring and ranking provide a basis for state-wide comparison of the San Diego region listed projects on a "level playing field" with other regions of the state that may have different sets of watershed goals and opportunities. For example, the San Diego Region has fewer opportunities for large storm water capture and groundwater infiltration to augment local water supplies than other regions due to its geology and topography. The local regional scoring compares projects that all have similar regional constraints and, therefore, provides a "local perspective" that takes into account regional opportunities and constraints, priorities, and goals specific to the region. Projects in the region may rank stronger overall in other benefit areas. This

SWRP Checklist Guidelines

- ☒ Plan identifies opportunities to augment local water supply through groundwater recharge or storage for beneficial use of storm water and dry weather runoff.
- ☒ Plan identifies opportunities for source control for both pollution and dry weather runoff volume, onsite and local infiltration, and use of storm water and dry weather runoff.
- ☒ Plan identifies projects that reestablish natural water drainage treatment and infiltration systems, or mimic natural system functions to the maximum extent feasible.
- ☒ Plan identifies opportunities to develop, restore, or enhance habitat and open space through storm water and dry weather runoff management, including wetlands, riverside habitats, parkways, and parks.
- ☒ Plan identifies opportunities to use existing publicly owned lands and easements, including, but not limited to, parks, public open space, community gardens, farm and agricultural preserves, school sites, and government office buildings and complexes, to capture, clean, store, and use storm water and dry weather runoff either onsite or offsite.
- ☒ For new development and redevelopments (if applicable): Plan identifies design criteria and best management practices to prevent storm water and dry weather runoff pollution and increase effective storm water and dry weather runoff management for new and upgraded infrastructure and residential, commercial, industrial, and public development.
- ☒ Plan uses appropriate quantitative methods for prioritization of projects. (This should be accomplished by using a metrics-based and integrated evaluation and analysis of multiple benefits to maximize water supply, water quality, flood management, environmental, and other community benefits within the watershed.)

will allow comparisons of top-ranked projects from this region with top-tier projects from other regions in the state.

The SWRP provides ranking on a watershed level as well, to encourage partnerships and collaboration of municipalities, agencies, and stakeholders to identify and develop multi-benefit projects that provide the greatest measurable effectiveness in meeting watershed goals and priorities established through the existing watershed plans (Section 5.3).

Quantification methods, as described under the SWRP Guidelines, are used in this plan to assess and score projects that are included on the SWRP project list. These methods include prioritization through a three-step SWRP project checklist (checklist). Quantification of benefits is achieved both through scoring the main and secondary benefits defined in the SWRP Guidelines, and through quantitative measurement of these benefits through project metrics (e.g., volume of water infiltrated or area of habitat restored).

As presented in this chapter, projects that are listed in the SWRP are assessed through a three-step process, including 1) project eligibility, 2) project benefit metrics, and 3) watershed prioritization. The process includes a series of “yes” and “no” questions that are then scored.

Step 1, project eligibility, is based on the criteria listed in the SWRP Guidelines. Step 2, project benefit metrics, is an integrated analysis of project-specific benefits and the quantification of these benefits. Projects receive higher scores for addressing more benefits and providing the quantification of these benefits. For Step 3, watershed analysis, the SWRP utilizes project identification and prioritization provided in watershed- and region-based planning documents. Projects receive higher scores when they have been ranked and identified as a priority within a watershed-based plan. A summary of these planning documents is presented in Section 5.1.

Scores are tallied for each of the main benefits and totaled for an overall score. This integrated analysis and prioritization method provides a quantification of the project benefits and encourages the development of multi-benefit projects that most effectively meet watershed goals as measured through defined project metrics. The three-step integrated analysis and prioritization process of the SWRP checklist is presented in Section 5.4.

5.1 Watershed and Regional Plans for Watershed Prioritization

The SWRP is a functionally equivalent plan that is composed of existing and future watershed and regional plans, which provide project identification, development, assessment, and prioritization under a set of criteria applicable to these plans. As these plans provide an assessment and prioritization of projects and strategies at a watershed basis, they are used to complete Step 3, watershed analysis. This SWRP builds from these plans to further encourage the development of multi-benefit projects with an emphasis on storm water and dry weather flow capture for beneficial uses. The use and integration of these plans into the SWRP is illustrated in Figure 5-1.

These existing plans include the WQIPs and IRWM Plan, which provide analysis of project opportunities for water quality, flood management, environmental, and community benefits. The only assessment not covered in existing plans is the analysis of public parcels for project opportunities for storm water and dry weather flow capture and beneficial use to augment local water supply. Assessment of public lands for water supply opportunities is included in Section 5.2 and Appendix H of this document.

The following sections summarize several of the existing plans that are used as part of this functional equivalent SWRP, as illustrated in Figure 5-1. Additional plans that are not referenced or future plans that have not yet been developed may still be used in Step 3, watershed analysis, although they are not presented here.

5.1.1 Water Quality Plans

This SWRP uses the WQIPs (along with other water quality plans) as a basis to assess and prioritize storm water management projects that have a primary benefit of water quality. Projects listed in the SWRP that have storm water water quality as a key benefit are prioritized based on whether they meet the goals stated in the WQIP for each WMA and are consistent with the strategies and timelines to meet interim and final goals per the WQIPs. No assessment or quantification of overall storm water projects within a watershed with a primary water quality goal are conducted in this SWRP as this analysis is presented in each of the WQIP by WMA. Strategies to meet water quality goals based on the highest priority water quality conditions are assessed in the WQIP with regard to how these strategies will meet goals and timelines. Projects listed in the SWRP are assessed in how they meet the goals, priorities, strategies, and timelines on a watershed basis per the WQIPs through the completion of the checklist process for listing in this SWRP. Further discussion of the goals, strategies, and timelines are provided in Section 5.3.

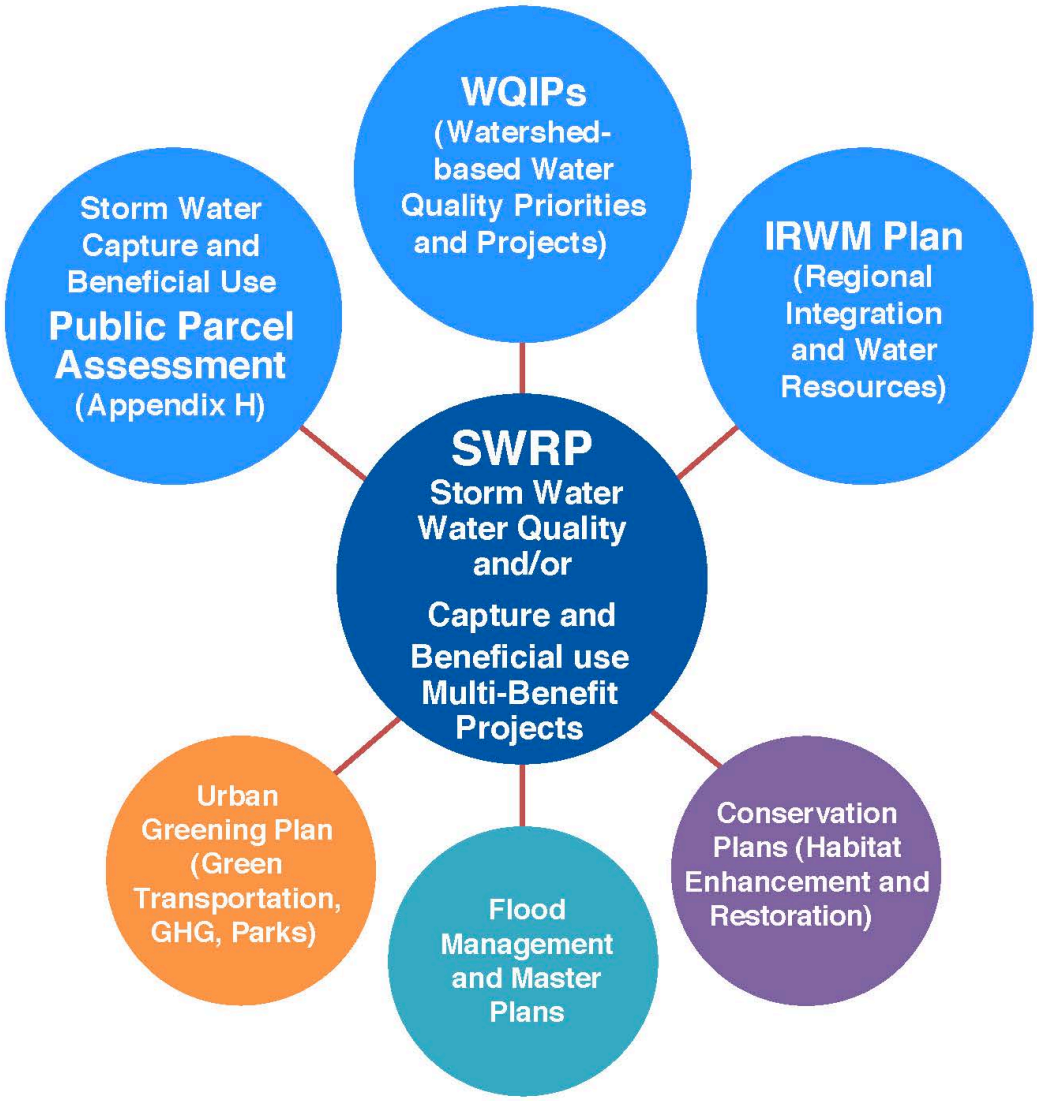

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Figure 5-1
Functionally Equivalent SWRP –
Builds on Existing and Future Watershed and Regional Plans

WQIPs were developed in compliance with the Regional MS4 Permit. These watershed-specific plans were developed by the Copermittees of each WMA, and are intended to provide a process by which the Copermittees can select and address the highest priority water quality issues within the applicable WMA. The WQIPs include descriptions of the highest priority pollutants or conditions in a specific watershed, goals and strategies to address those pollutants or conditions, and time schedules associated with those goals and strategies. The WQIPs include drainage area assessments of the highest priority areas in order to identify the pollutant discharges and other sources that are causing the high priority condition. They also provide strategies to address the high priority water quality conditions, interim and final water quality targets for these strategies, and timelines to achieve the targets. While the WQIPs focus on water quality, they also provide multi-benefit project goals, targets, identification, assessment, prioritization, and timelines for implementation. These plans, therefore, provided significant input to the SWRP checklist. Additional water quality plans that are elements of the WQIP are discussed below.

WMAAs are included in the WQIPs. These analyses are intended to describe the hydrologic features of the WMAs. The WMAAs are used to develop watershed-specific requirements for structural BMP implementation.

In accordance with the San Diego Storm Water MS4 Permit, each Copermittee is to implement a program to control the contribution of pollutants to and the discharges from the MS4 within its jurisdiction. The goal of the jurisdictional runoff management programs is to implement strategies that effectively prohibit non-storm-water discharges to the MS4 and reduce the discharge of pollutants in storm water to the MEP. This goal will be accomplished through implementing the jurisdictional runoff management programs in accordance with the strategies identified in the WQIP. Each Copermittee must update its jurisdictional runoff management program document. These documents include provisions for storm water management practices for new and redevelopment projects and the use of BMPs to prevent and reduce sources of water quality pollutants at construction sites and in existing residential, commercial, and industrial land uses within the jurisdiction.

The MS4 permit provides Copermittees the option of pursuing off-site compliance for hydromodification and pollutant control if there is a greater overall water quality benefit than complying on site. The Water Quality Equivalency (WQE) Guidelines were created to clarify the “greater overall water quality benefit” language and develop minimum standards for demonstrating water quality equivalence.

5.1.2 Water Supply Plans

No watershed- or regional-plans currently analyze public parcels for opportunities for storm water and dry weather flow capture and beneficial use to augment local water supply. The IRWM Plan provides identification and assessment of water resource management projects, which include augmentation and conservation of local water supplies, but the plan does not provide specific focus on storm water and dry weather flow capture for direct use. Examples of direct use include: infiltration into groundwater aquifers for water supply, use to supplement irrigation at local parks or habitat restoration projects, and diversion of these flows to a sanitary sewer that will treat the

water for potable or recycled water use. A number of the WQIPs also include discussion of these types of projects, but do not focus on achieving the water supply benefit or an assessment of public parcels for these types of water supply opportunities. Assessment of public lands for water supply opportunities is included in Section 5.2 and Appendix H.

5.1.3 Flood Management Plans

Storm water management projects may have the additional benefit of decreasing flood risk. For this reason, flood management is considered as a potential benefit for SWRP projects.

The Integrated Flood Management Plan (IFMP) is part of the IRWM Plan and addresses the need to maximize productivity and benefits of a floodplain while maintaining public safety. The IFMP incorporates water resources management, flood plain development, sustainability, inter-agency and inter-watershed cooperation, and flood risk management into a regional and system-wide approach that can reduce potential negative unintended consequences.

The IFMP includes evaluation criteria to determine how projects are prioritized for federal funding. A numerical ranking system objectively prioritizes projects based on what watershed objectives they achieve. This system is called the Analytical Hierarchy Process and involves pairing different proposed objectives to determine relative values, and results in an objective numerical ranking of competing projects.

The County of San Diego Capital Improvement Program also analyzes potential flood management projects. The Department of Public Works manages capital improvement projects to improve infrastructure in the unincorporated areas of San Diego County. Funds are approved by the Board of Supervisors, with a budget of over $69 million for Fiscal Year 2016-2017. Other cities also have Capital Improvement Programs.

5.1.4 Environmental Plans

Environmental restoration projects are evaluated based on a number of criteria. The main environmental concerns in coastal Southern California include protection of wildlife and endangered species and controlling urban runoff. Estuaries are considered one of the most productive habitats and provide many benefits, including hosting a variety of species, providing flood protection and mitigation to sea-level rise, acting as carbon sinks, and providing aesthetic community areas. Unfortunately, many of these coastal wetlands have been negatively affected by nearby urban development, resulting in alteration of the natural ecology, hydrology, and hydrodynamics of the system. Storm water management projects may have the additional benefit of enhancing and restoring habitats. For example, the implementation of a regional storm water bio-retention basin may include the enhancement and restoration of adjacent and downstream riparian habitat. Another example is the implementation of a dry weather diversion and beneficial use to reduce fresh water inputs to a coastal lagoon under a TMDL due to increased sediment and freshwater inputs. This project is a dry weather flow diversion and beneficial use project that has a habitat restoration component. The environmental plans referenced here provide for identification of sensitive and protected habitat that may provide opportunities for enhancement

such as removal of invasive species and re-planting with native vegetation as part of storm water and dry weather flow water quality and/or beneficial use projects.

The San Diego region has restoration plans to address impacts to habitats at the regional, county, and watershed level. For example, the Southern California Wetlands Recovery Project (SCWRP) is dedicated to acquiring, restoring, and expanding coastal wetlands and watersheds throughout Southern California. SCWRP produces an annual work plan that prioritizes wetland restoration projects in the region.

The Multiple Species Conservation Program (MSCP; CSD, 2016) covers southwestern San Diego County and was developed to protect biodiversity and preserve the region's habitats and open space. Under this program, identified areas are monitored in order to meet the habitat needs of multiple species and protect biological resources and native vegetation. The Multi-Habitat Planning Area Guidelines are used to evaluate development projects in order to ensure compliance with MSCP.

At the watershed level, many of the lagoons in the region have restoration or enhancement plans associated with them. For example, the Los Peñasquitos Lagoon Enhancement Plan (2016) presents a phased approach to restoration with different restoration actions prioritized over other longer-term actions.

As part of the development of this SWRP, a public parcel analysis was completed for selected watersheds to assess the opportunities for creek and wetland restoration. The public parcel analysis was completed using available parcel data that was screened for public parcels within a quarter mile of streams and tributaries, that are at least one acre in size, and have less than 15 percent slope. Stream segments within public parcels and right of ways are also identified. Parcels that are designated as habitat protection areas that would likely require mitigation for temporary disturbance are also identified within the set of public parcels that meet the stated criteria. The results of this public parcel analysis are presented in Appendix E. These maps are provided as additional tools in coordination with regional and watershed plans to assist in identifying multi-benefit creek and riparian habitat restoration and enhancement opportunities.

5.1.5 Community Plans

Communities within San Diego have local plans that describe their values and guide land use and development to achieve the communities' desired goals. For example, the San Dieguito Community has a plan that outlines their values and concerns such as enhancing public areas, promoting conservation and habitat protection, and maximizing educational opportunities. Storm water management projects may be integrated with these community goals and plans to provide additional benefits that include improving communities. For example, the implementation of a green street and bio-retention basin to improve water quality and recharge local groundwater can be integrated with the expansion of adjacent trails, green space and educational signage linked to a community park. Existing community plans that include planned green spaces, trails, and educational opportunities can therefore be used to integrate the storm water management projects with these community plans and goals to provide additional benefits. Community plans provide

goals that may be different from storm water management plans, but when integrated can provide multiple benefits, including education and behavior changes that can lead to improved water quality.

There are also plans that span multiple benefit categories and include a community component. For example, the San Diego River WURMP addresses both water quality issues and education to enhance public understanding of sources of water pollution and to encourage community stakeholders to participate in the plan.

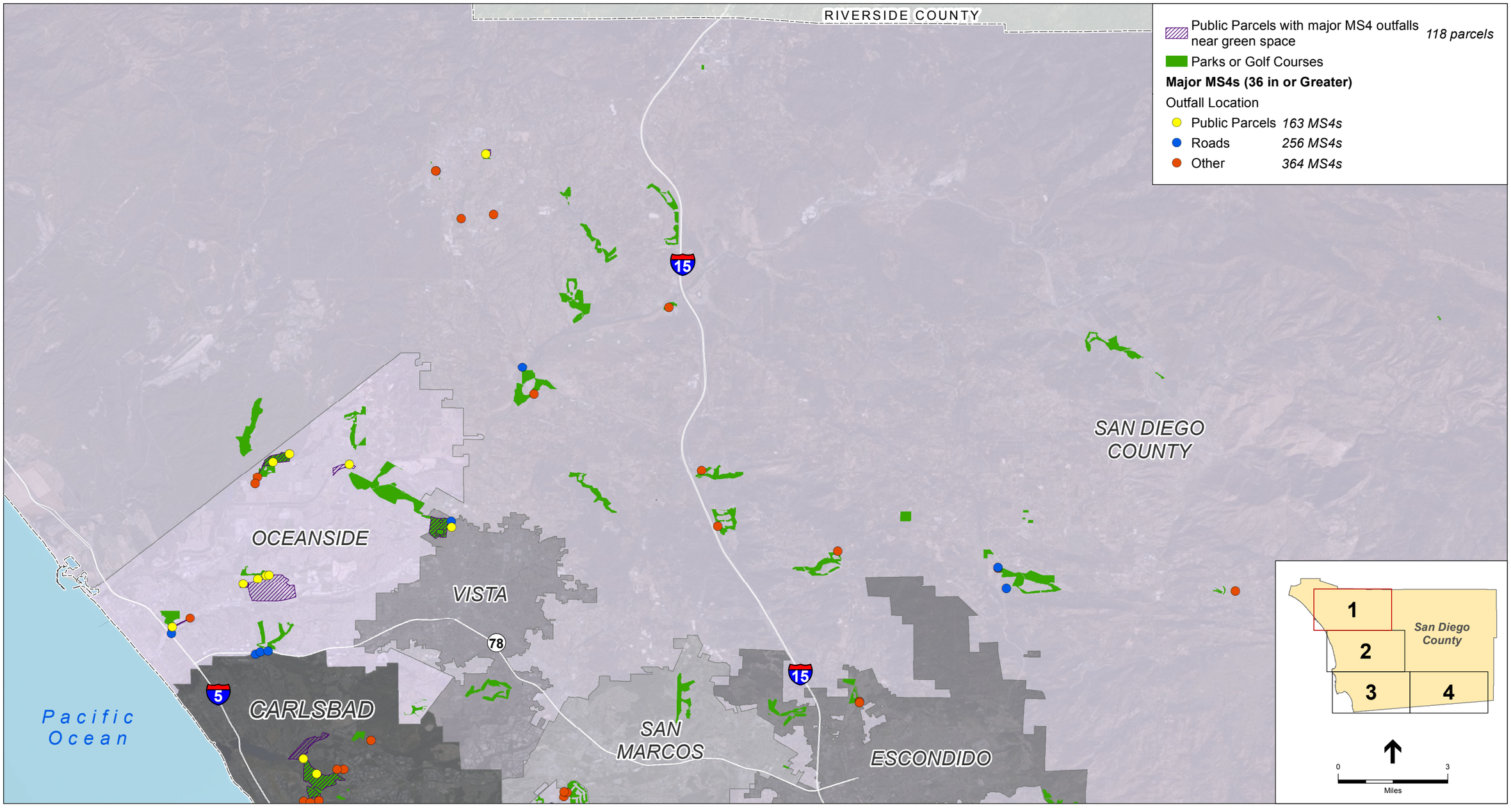
Some cities within San Diego County have Urban Greening Plans that outline opportunities for the city to increase and enhance public green areas. These documents can inspire projects to integrate green streets, community connectivity and transportation, and urban forestry design into project proposals.

A variety of other plans also provide prioritization of community-oriented projects. These plans include recreational, education, development, active transportation, and job opportunity plans, and are most common at the local level.

5.2 Water Supply Project Opportunities

Appendix H presents an assessment of potential storm water and dry weather flow capture and direct use opportunities in the region. Direct use, in this context, is an end use that can augment or conserve local water supplies. Opportunities for direct use of captured storm water and dry weather flows have greater constraints in this region compared to other regions due to a more limited number of groundwater aquifers that are used for potable water supply and a more limited current capacity for treatment and redistribution of captured storm water. The purpose of this assessment is to supplement watershed and regional plans to identify these opportunities for further development and prioritization. The opportunities presented in Appendix H provide a tool for project sponsors to potentially develop or expand projects in order to provide greater water supply benefits and to increase the project score under the SWRP prioritization process described in Section 5.4.

Project applicants can use the analysis presented in Appendix H and the maps presented in Figures 5-2 through 5-5 to develop or add a water supply component to their project based on the project location. The County and IRWM Program plan to augment this initial opportunity assessment with a more detailed analysis and identification of specific projects for storm water capture and beneficial use in 2017. The San Diego IRWM Region secured a Proposition 1 IRWM planning grant to update its 2013 IRWM Plan. As part of the update, it will complete a Storm Water Capture Feasibility Study (SWCFS). The SWCFS will be used to expand and strengthen the storm water discussion in the IRMW Plan and help identify and prioritize future storm water projects to augment water supply and other beneficial uses, where feasible.



SOURCE: ESRI, 2016; SanGIS, 2016

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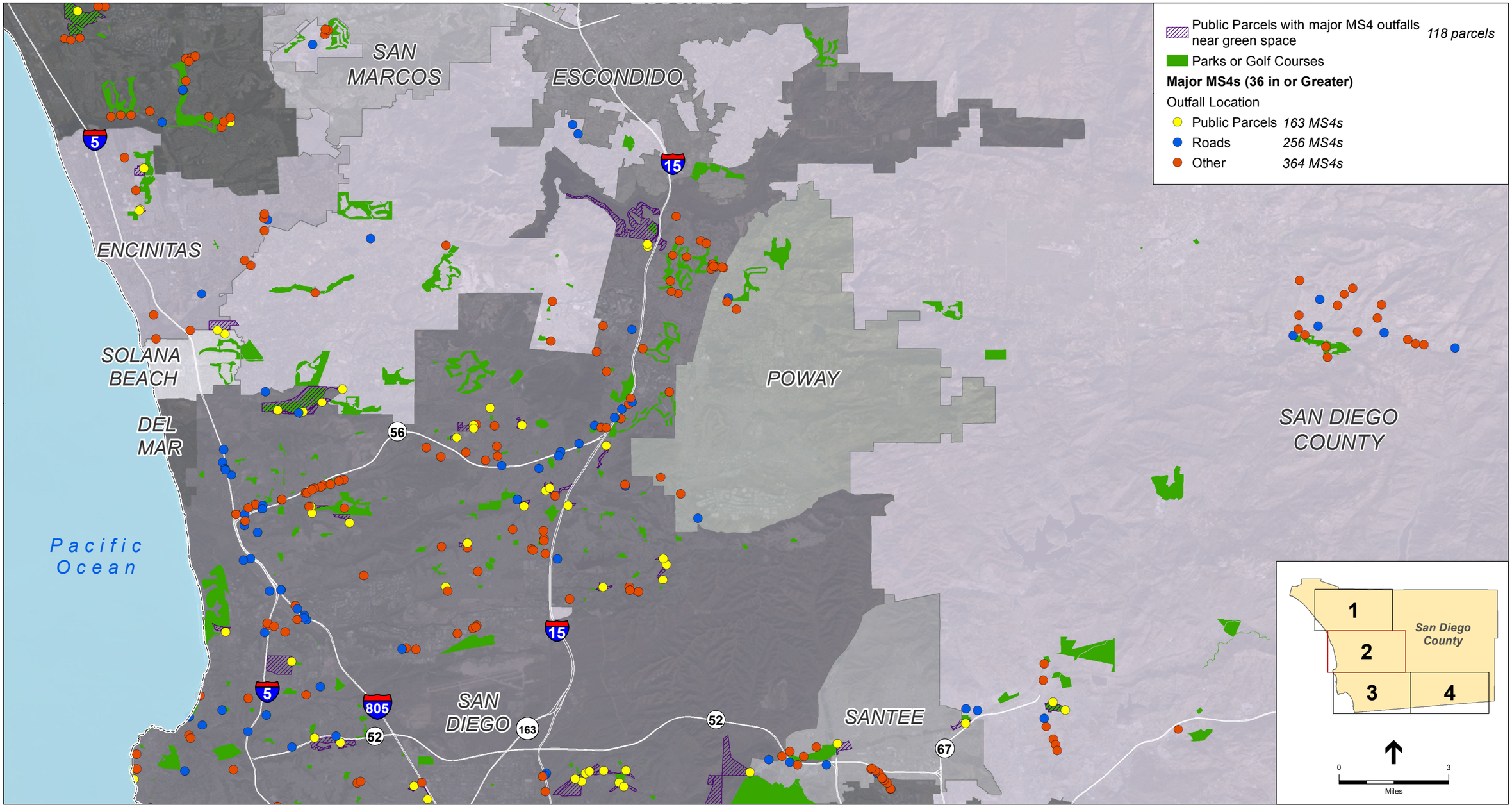
Figure 5-1

Public Parcels with Major MS4 Oufalls
Located within 1/4 Mile of Green Space

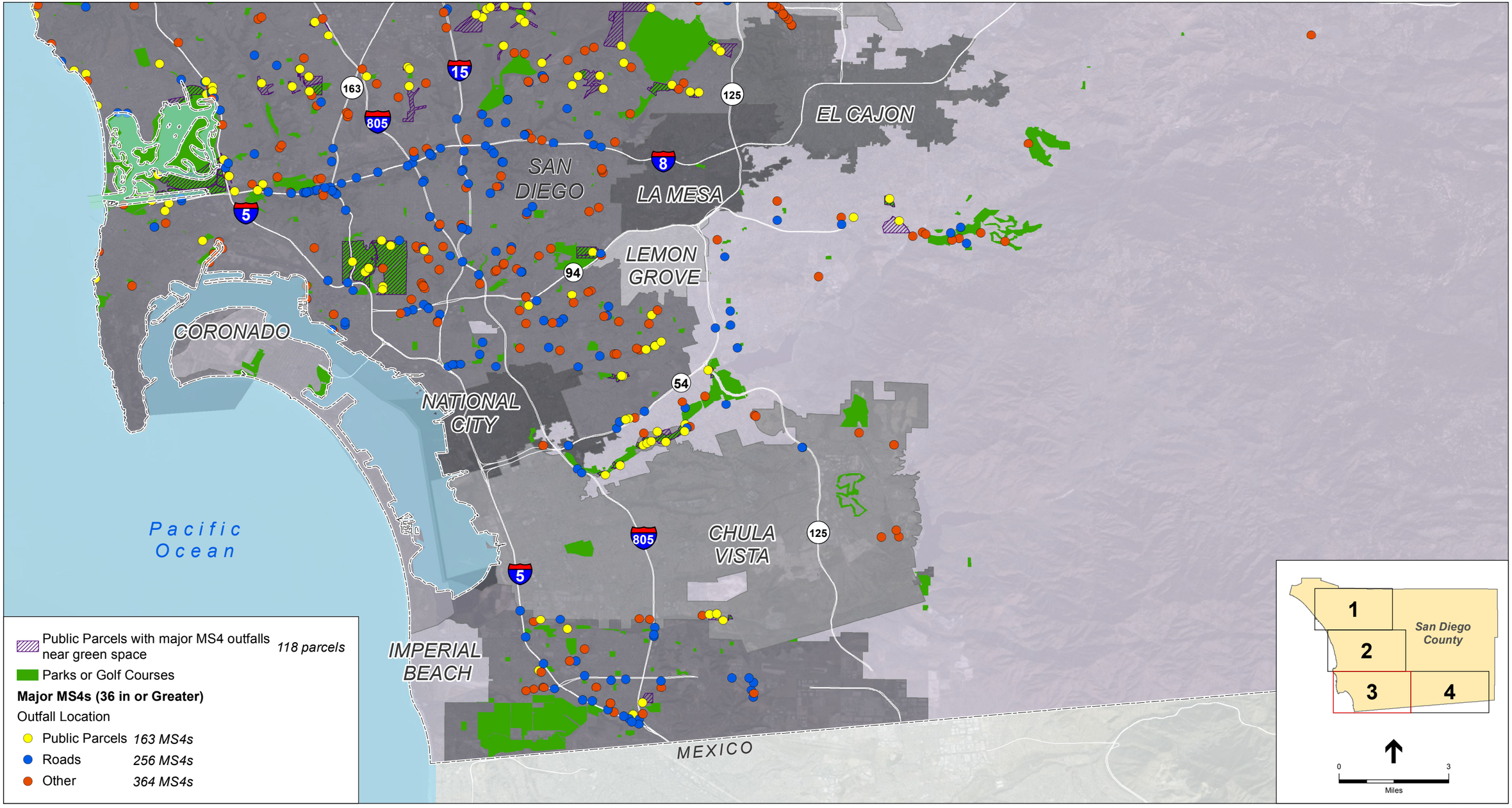


SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 5-2b

Public Parcels with Major MS4 Oufalls
Located within 1/4 Mile of Green Space



SOURCE: ESRI, 2016; SanGIS, 2016

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Figure 5-2c

Public Parcels with Major MS4 Oufalls
Located within 1/4 Mile of Green Space

Public Parcels with major MS4 outfalls near green space *118 parcels*

Parks or Golf Courses

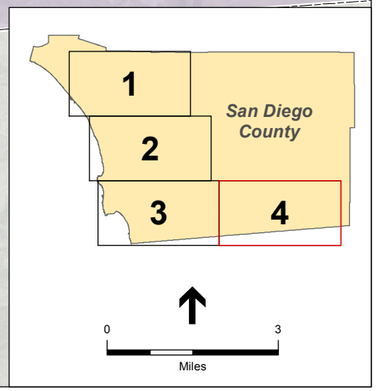
Major MS4s (36 in or Greater)

Outfall Location

- Public Parcels *163 MS4s*
- Roads *256 MS4s*
- Other *364 MS4s*

8

MEXICO



SOURCE: ESRI, 2016; SanGIS, 2016

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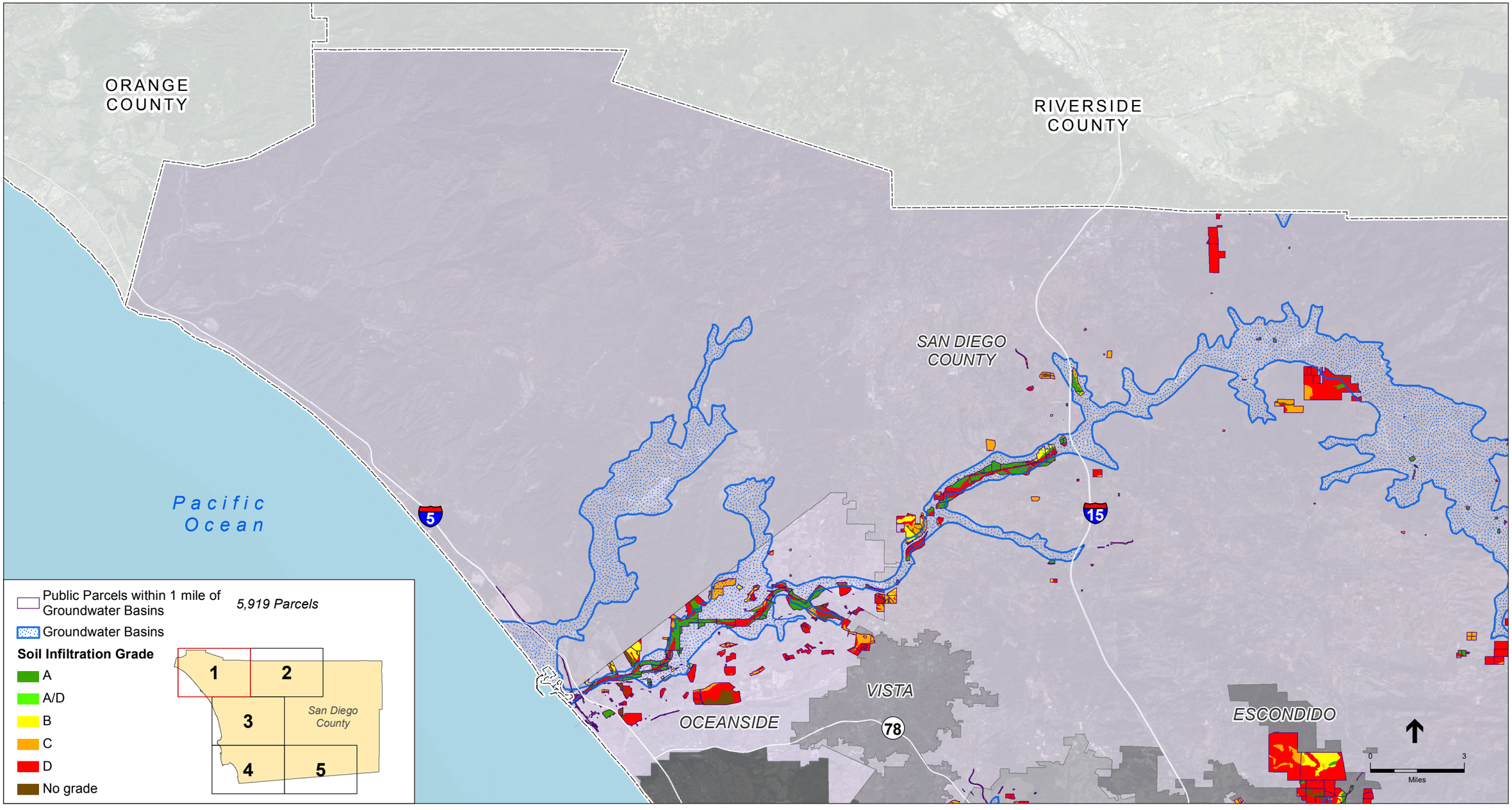
Figure 5-2d

Public Parcels with Major MS4 Oufalls
Located within 1/4 Mile of Green Space



SOURCE: ESRI, 2016;SanGIS, 2016; NRCS, 2016

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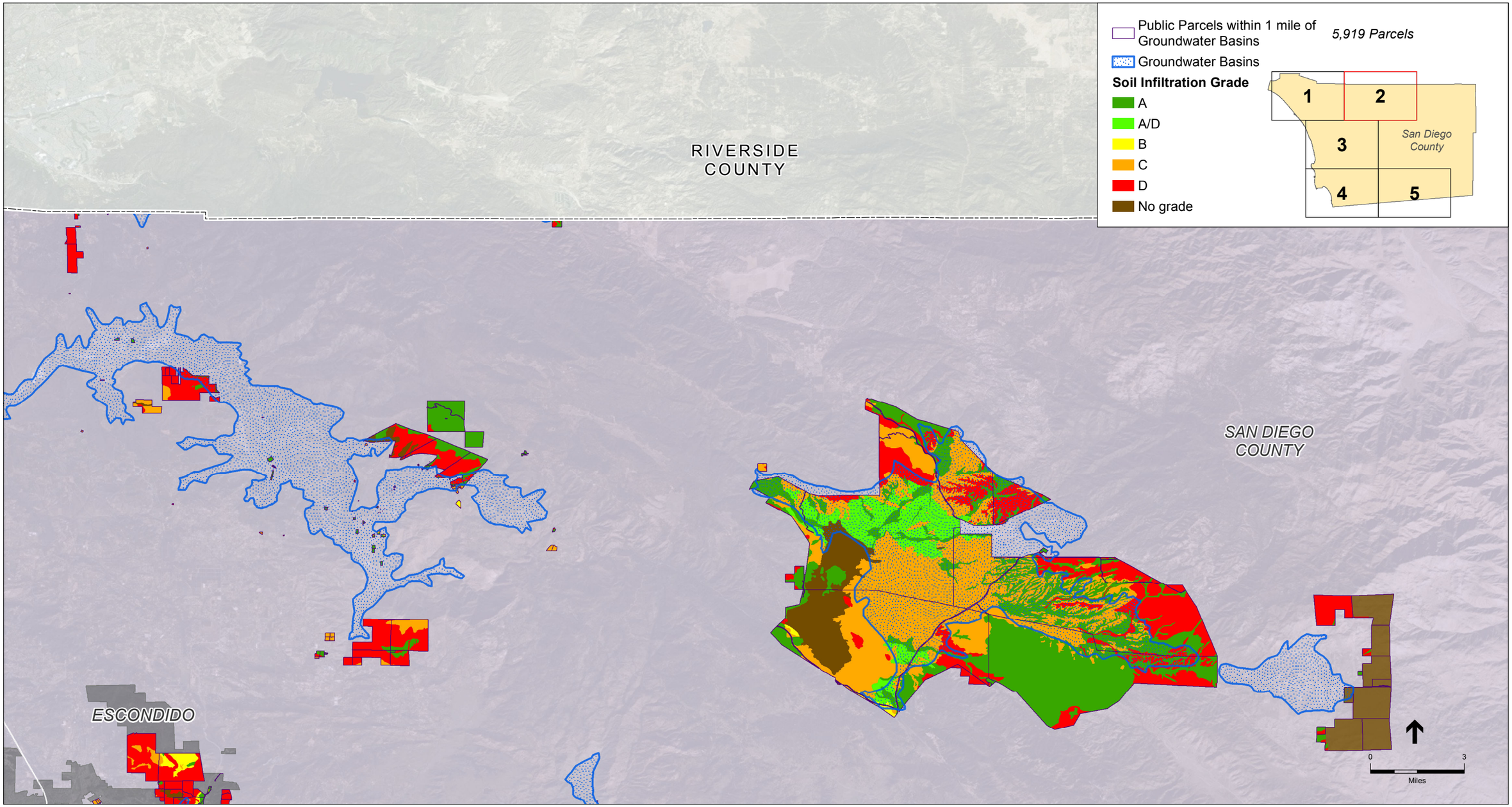
Figure 5-3a

Public Parcels Within a Mile Of a Groundwater Basin



SOURCE: ESRI, 2016;SanGIS, 2016; NRCS, 2016

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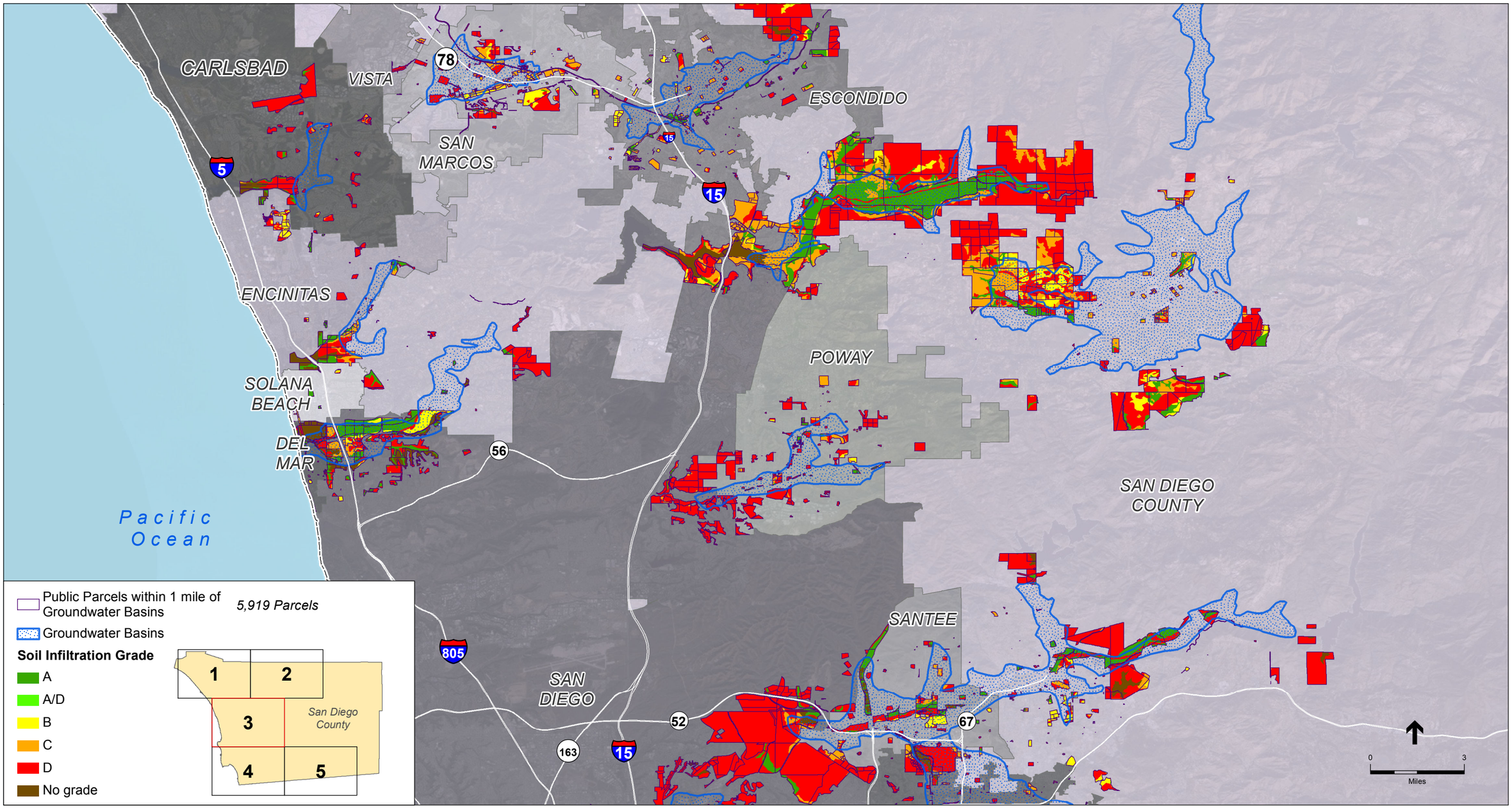
Figure 5-3b

Public Parcels with Major MS4 Outfalls Located Within ¼ Mile of Green Space



SOURCE: ESRI, 2016;SanGIS, 2016; NRCS, 2016

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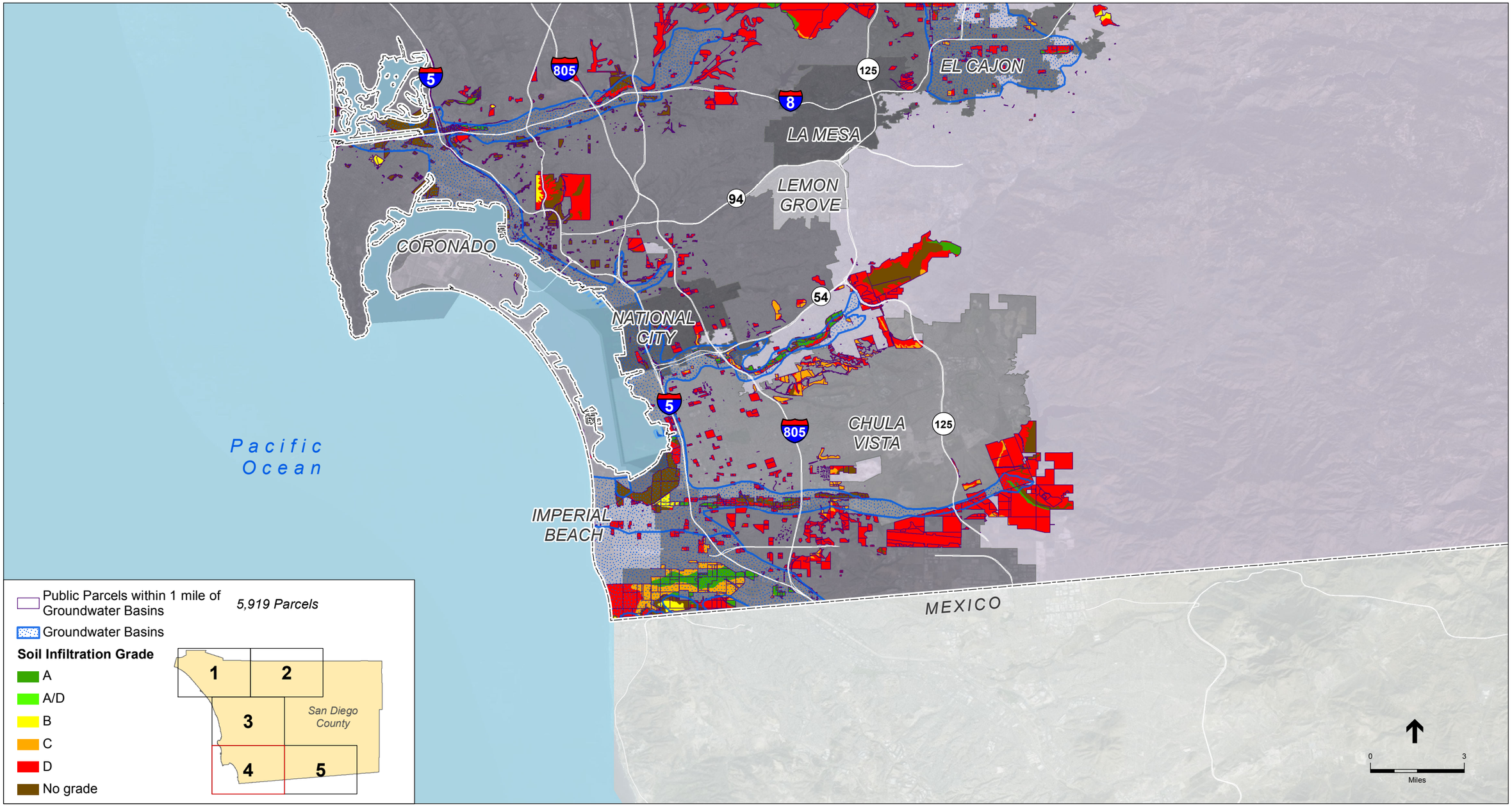
Figure 5-3c

Public Parcels Within a Mile Of a Groundwater Basin



SOURCE: ESRI, 2016;SanGIS, 2016; NRCS, 2016

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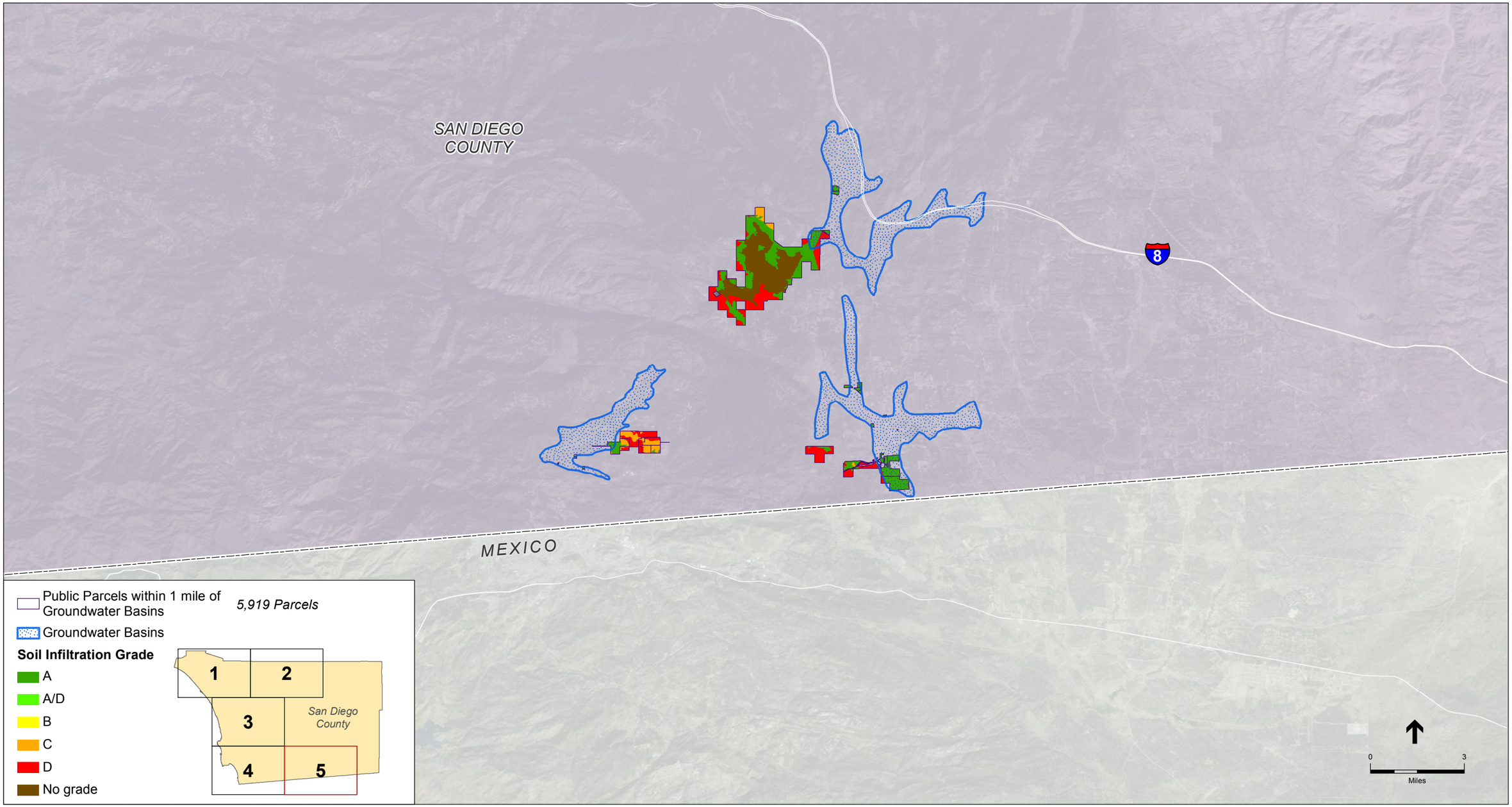
Figure 5-3d

Public Parcels Within a Mile Of a Groundwater Basin



SOURCE: ESRI, 2016;SanGIS, 2016; NRCS, 2016

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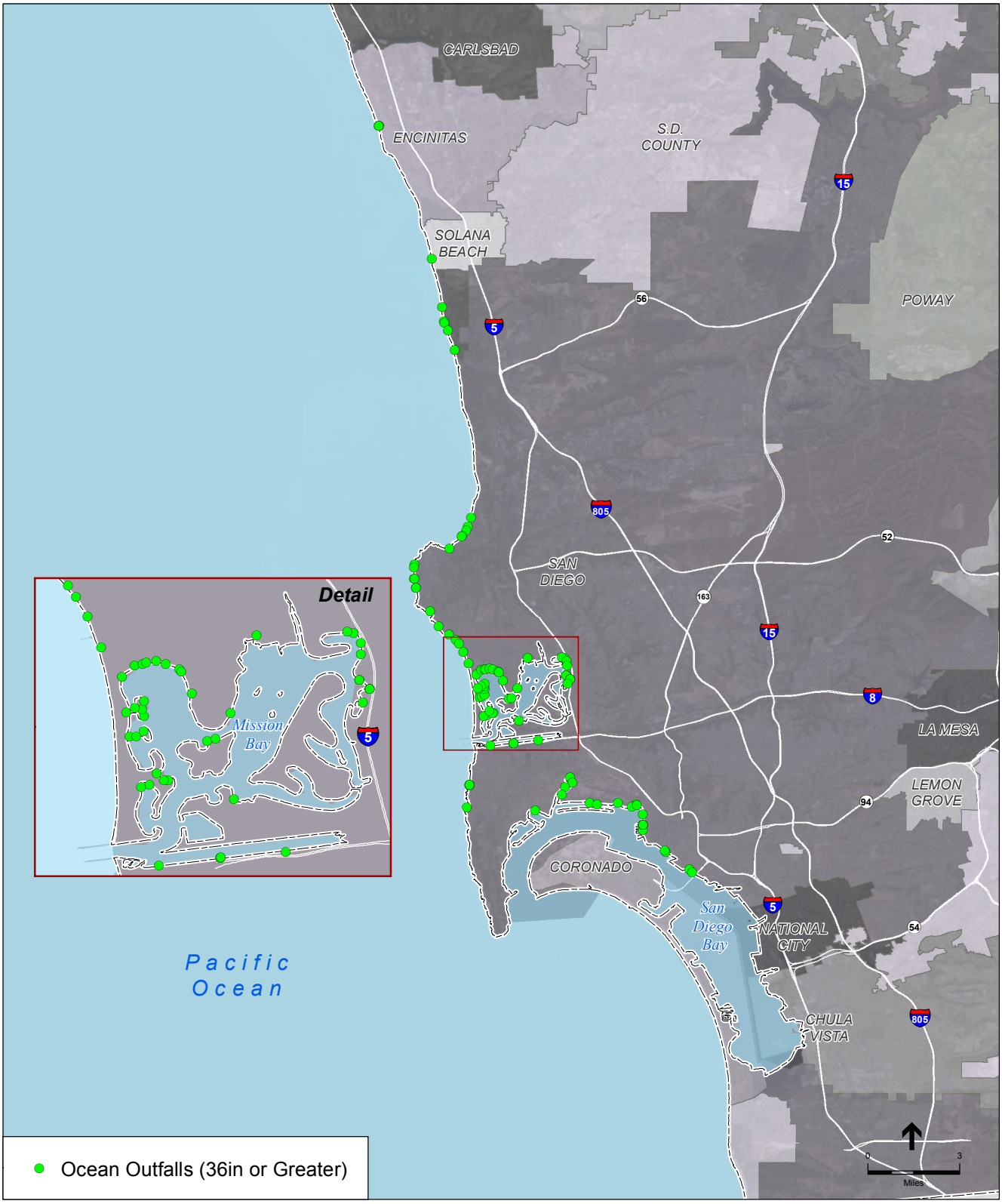
Figure 5-3e

Public Parcels Within a Mile Of a Groundwater Basin



SOURCE: ESRI, 2016; SanGIS, 2016; IRWM, 2016

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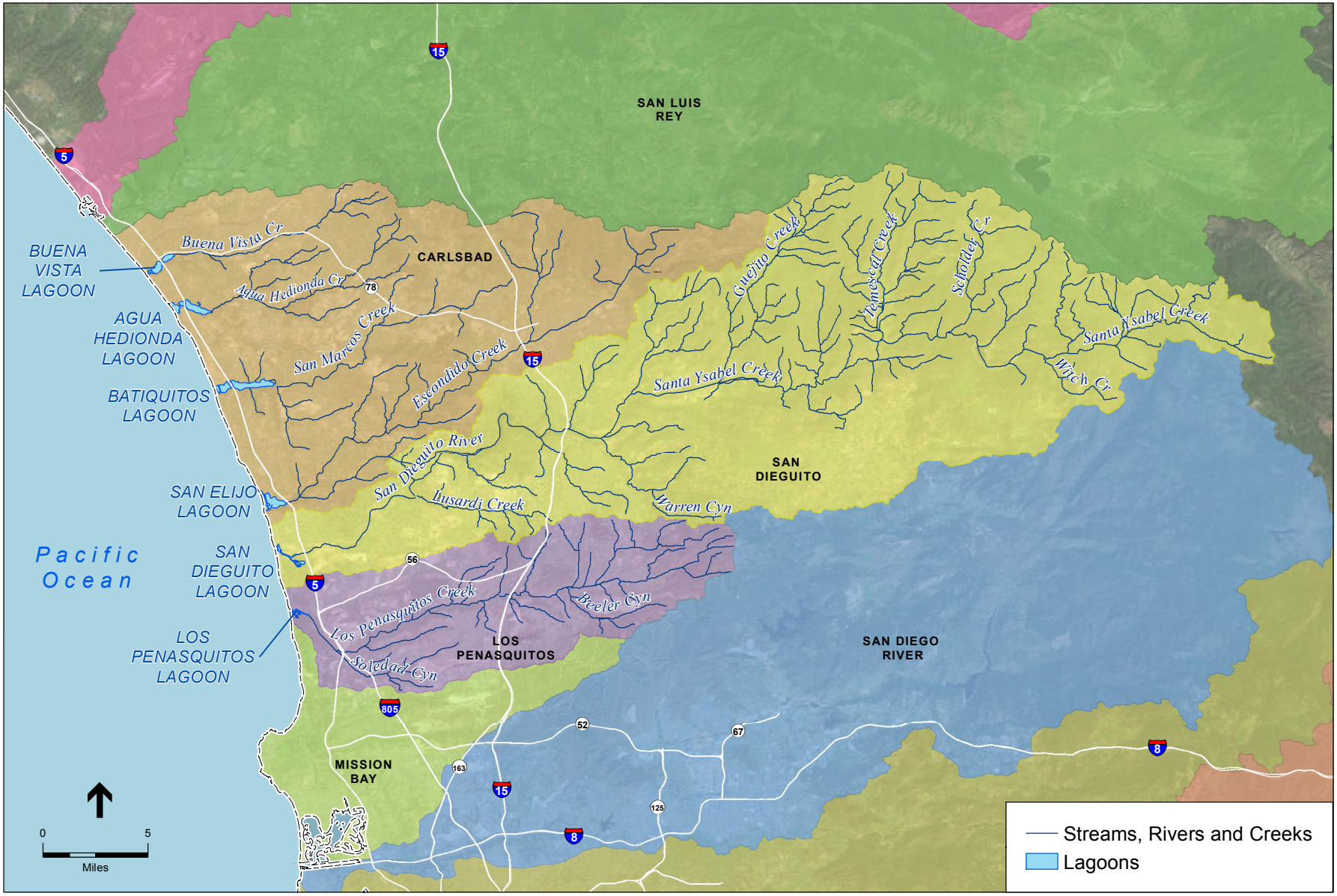
Figure 5-4

Major MS4 Outfalls to the Ocean



SOURCE: ESRI, 2016; SanGIS, 2016

SWRP . 160618

Figure 5-5

Creeks Systems with Lagoon Outlets

The SWCFS will quantify the amount of storm water potentially available for capture in each watershed in the region; analyze existing centralized and decentralized storm water capture facilities, projects, and programs, that may affect storm water capture and use in the region; identify and prioritize specific areas, projects, and alternatives to increase storm water capture and reuse; and complete a cost analysis. Any projects that are identified would be added to the IRWM Plan and SWRP project lists through OPTI. Since this more detailed analysis is through the IRWM Plan, their more detailed project list will become one of the plans used to develop and list projects in the SWRP. As an adaptive SWRP, new and revised regional and watershed plans will continue to be used to develop, prioritize, and list projects in the SWRP.

Three types of storm water capture and beneficial use (direct use that augments and/or conserves local water supply) opportunities are presented and assessed in this SWRP. These types consider the opportunities and constraints in the San Diego Region and include:

- **Irrigation** - Store and divert storm water and dry weather flows to be used as irrigation on site, at a park, for habitat restoration, or to sustain a natural treatment system. Figure 5-2 identifies the parcels with a major MS4 outfall (greater than 36 inches) that are within a quarter mile of a park or a golf course and so could be used for irrigation.
- **Groundwater Aquifer Recharge** - Store and infiltrate storm water and dry weather flows to recharge a groundwater aquifer that is used as a potable water supply. Figure 5-3 identifies parcels within a mile of a groundwater basin which could be used for infiltration.
- **Treatment Facility for Recycled and Potable Water** – Store and divert storm water and dry weather flows to a wastewater or water treatment facility for recycled or potable water use. Figure 5-4 shows existing ocean outfalls, while Figure 5-5 shows creeks that enter lagoons, both of which could provide opportunities for dry weather flow diversion.

These opportunity types are further discussed and quantified in Appendix H.

5.3 Water Quality Watershed-Based Goals, Strategies, Quantifications, and Timelines

This SWRP uses the WQIPs to assess and prioritize storm water management projects on a watershed basis that have water quality as the primary benefit. This SWRP does not present the assessment or quantification of overall water quality storm water projects on a watershed basis, as this analysis is presented in each of the WQIPs. The WQIPs provide the basis for the larger set of water quality projects, programs, and strategies by which the SWRP-listed projects are compared and scored. In each of the WQIPs, goals have been developed based on the highest priority water quality conditions for each WMA. For many of the coastal watersheds in the region, Bacteria TMDL load reduction goals are the basis for the development of interim and final goals. These goals are therefore regulation-driven and part of the MS4 permit. As the highest priority water quality conditions vary with each WMA, the defined interim and final goals and timelines are WMA-specific. Strategies to meet water quality goals based on the highest priority water quality conditions are assessed in the WQIP with regard to how these strategies will meet the goals and

timelines. Specific projects and strategies have been modeled to determine the type and quantity needed to meet the pollutant load reduction goals, hydromodification, and other water quality goals that correspond to the highest priority water quality condition. Therefore, the quantification of the strategies to meet the watershed-based water quality goals are conducted and presented in the WQIPs.

Methods for identifying projects and strategies to meet the watershed-based water quality goals are extensive and are in some cases being updated. Conceptual projects used to assess how goals are to be met are in various phases of assessment, and in some cases determined to be infeasible, requiring the development of new concepts. In order to maintain the adaptability of this SWRP, the goals, timelines, and quantification assessment of the strategies of each WMA refers to the WQIPs. This approach is more adaptable and builds on the extensive work completed and ongoing by the Copermittees. The MS4 Permit requires that the WQIPs be updated and adaptable. This approach is used for the identification and prioritization of any projects to be listed in the SWRP, as it builds on the work and assessment of existing plans at a benefit and watershed level. The Text Box on the San Diego River WQIP presented on the following pages provides an example of the analysis that is conducted in the WQIPs. This SWRP addresses the plan goal of assessing and prioritizing on a watershed basis by requiring all projects listed in the SWRP to be assessed using the SWRP checklist, which prioritizes projects based on whether they meet the water quality goals stated in the WQIP for each WMA and are consistent with the strategies and timelines to meet interim and final goals per the WQIPs. This is the watershed analysis step in the checklist process. Table 5-1 presents the priority strategies listed in each WMA's WQIP.

Example WQIP Identification and Analysis of Watershed Strategies –San Diego River WMA

The WQIP includes a thorough analysis of water quality conditions and identifies the highest priority conditions for which to develop interim and final goals. For the San Diego River WMA, fecal indicator bacteria (FIB) were identified as the highest priority water quality condition. Goals were then developed for each jurisdiction based on the Bacteria TMDL load allocations and modeling that was performed for the TMDL, Comprehensive Load Reduction Plans, and the WQIPs. Interim and final FIB load reduction goals have been developed on a jurisdictional level for wet weather flows. These are presented in the WQIPs as a percent of the baseline annual FIB load from MS4 discharges. Percent load reductions are presented for each period prior to the final compliance date. The percent load reductions for the San Diego River WMA are undergoing updates.

Watershed strategies were then identified and analyzed using modeling, in some cases, to determine the type and extent of strategies needed to meet the established interim and final goals. Strategies considered in the San Diego River WMA WQIP to address the bacteria reduction goals are listed in the table below. These strategies include current jurisdictional programs and non-structural BMPs, such as source control measures and structural BMPs. These strategies include addressing potential pollutant loadings from new and re-development projects through BMP design standard updates, inspections, and enforcement measures. Strategies were analyzed and prioritized for each jurisdiction.

Existing Baseline Strategies[a]	Nonstructural Strategies[b]	Structural Strategies[c]
• Development and Redevelopment Planning • Construction Management and Inspections • Existing Development Management • Illicit Discharge Detection and Elimination • Education of Municipal, Industrial, Commercial, and Residential audiences • Public Outreach and Participation • Stormwater conveyance cleaning • Street sweeping • Commercial/Industrial inspections • Municipal audits	• Identification and control of sewage discharge to the stormwater conveyance system • Pet waste programs • Trash cleanups • Onsite wastewater treatment source reduction • Commercial/industrial good housekeeping • Irrigation runoff reduction and good landscaping practices • Animal facilities management • Erosion Monitoring and Repair • Street and median sweeping • Stormwater conveyance system cleaning and channel maintenance • Education and Outreach • Homelessness waste management • Property Based Inspections and Enforcement	• Infiltration BMPs (e.g., basins, bioretention, permeable pavement) • Rainwater harvesting • Biofiltration BMPs • Green Streets • Infrastructure improvements • Pretreatment BMPs • Strategic retrofits in areas of existing development; • Water course rehabilitation (e.g., stream restoration/ enhancements) • Advanced treatment and proprietary devices • Potential Public Private Partnership Program • Redevelopment and LID implementation

[a] Existing Jurisdictional Programs

[b] Potential shifts of current resources and/or enhance Existing Jurisdictional Programs to focus on areas/activities identified to be most effective at targeting reductions in bacteria

[c] The identification of potential improvement strategies is intended to create a list of activities that may or may not be implemented by each Participating Agency; and at this stage no commitment is made with regard to each strategy. The County of San Diego has concerns as funding sources for implementation of structural BMPs have not been identified. By reason of constraints in California law and the California constitution, Caltrans funds are subject to legislative appropriation and availability of funds.

For the San Diego River WMA, distributed BMPs, including green streets, were identified in a number of jurisdictions as one of multiple watershed strategies to meet the water quality goals. Potential locations and priority drainage areas were identified to prioritize the implementation of these strategies. The identification of potential BMP sites included an assessment of public parcels. The figure below presents potential distributed BMP locations that provide a set of potential projects to meet the stated goals.

The water quality benefits from distributed systems are quantified in the WQIPs as load reductions to be achieved toward meeting the interim and final goals from these strategies. The implementation of distributed green-street BMPs contribute to the overall load reduction goals. For this watershed, the percent load reduction for some jurisdictions using distributed BMPs may range from 10-15% and provide a significant portion of the total FIB load reduction needed to meet the interim and final goals.

The WQIPs provide the basis for the analysis of storm water management opportunities that have water quality as the main benefit. This analysis identifies the set of watershed strategies that are planned to meet the interim and final water quality goals. In this example, the water quality benefit of distributed green-street type projects is quantified and compared to the overall load reduction goals in the WQIP. As a strategy that provides a significant portion of load reduction for some jurisdictions, this watershed strategy would be rated high based on this quantifiable analysis presented in the WQIP. Projects listed in the SWRP are assessed quantitatively with these strategies to provide a comparison to this larger set of opportunities in each watershed and regionally with regard to attainment of the water quality goals stated in the WQIPs.

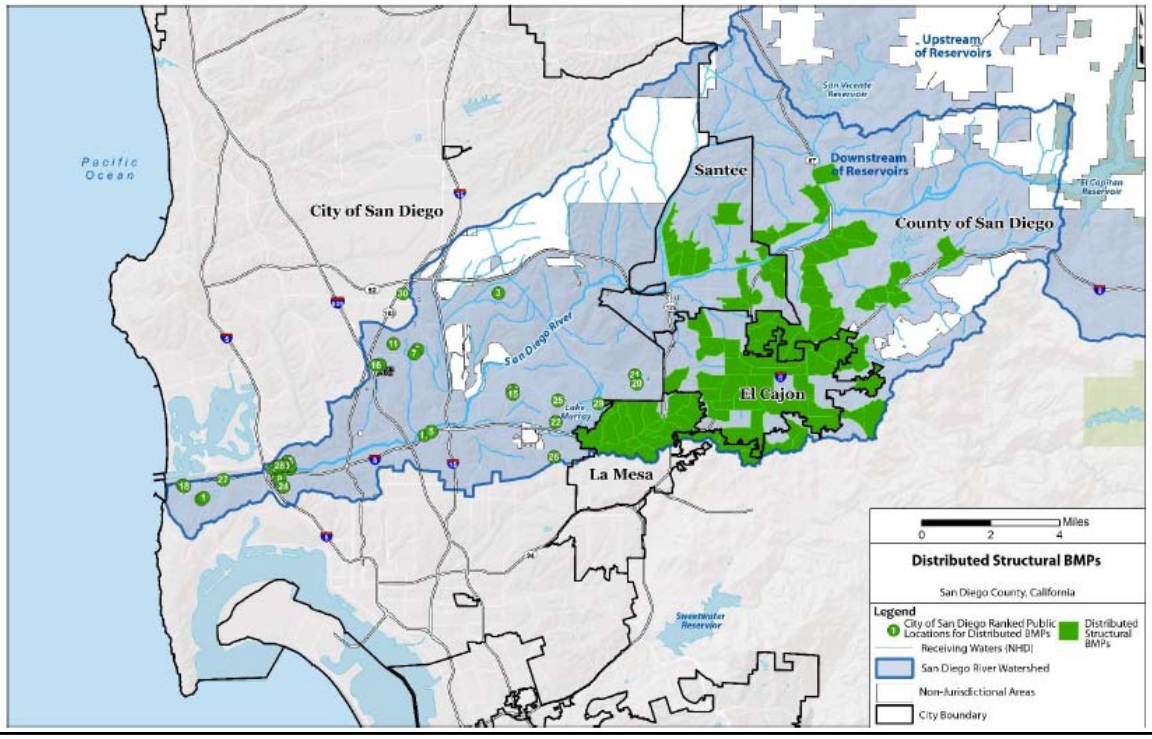


TABLE 5-1
PRIORITY WATERSHED STRATEGIES

WMA	Jurisdiction (or HA)	BMPs	Green Streets	Irrigation control	JRMPs	Think Blue Program	SWPPP	Non-SUSMP (Standard Urban Storm Water Mitigation Plan)	MS4 Infrastructure	Infiltration and Detention Basins	Retrofit and Rehabilitation in Areas of Existing Development	Pesticides, Herbicides, and Fertilizer BMP Program	Road, Street, Parking Lot Structure Projects	Priority Development Projects	Illicit discharge, detection, and elimination	Urban Tree Canopy	Public outreach
Los Peñasquitos	Caltrans	X															X
	City of Del Mar		X	X	X												X
	City of Poway	X			X												X
	City of San Diego	X	X			X		X				X		X			X
	County of San Diego	X			X												X
Carlsbad (by HA)	Loma Alta HA	X		X	X				X		X				X		X
	Buena Vista Creek HA	X	X	X	X				X								X
	Agua Hedionda HA	X			X				X		X		X		X		X
	Encinas HA	X			X								X		X		X
	San Marcos HA	X	X	X	X						X		X		X		X
	Escondido Creek HA	X		X	X			X			X		X	X	X		X
Mission Bay	Caltrans	X			X					X		X	X		X		X
	City of San Diego	X	X	X	X				X		X	X	X		X	X	X
San Dieguito	City of Del Mar		X	X	X												X
	City of Escondido	X															X

WMA	Jurisdiction (or HA)	BMPs	Green Streets	Irrigation control	JRMPs	Think Blue Program	SWPPP	Non-SUSMP (Standard Urban Storm Water Mitigation Plan)	MS4 Infrastructure	Infiltration and Detention Basins	Retrofit and Rehabilitation in Areas of Existing Development	Pesticides, Herbicides, and Fertilizer BMP Program	Road, Street, Parking Lot Structure Projects	Priority Development Projects	Illicit discharge, detection, and elimination	Urban Tree Canopy	Public outreach
	City of Poway	X			X		X										X
	City of San Diego	X	X			X		X									X
	City of Solana Beach	X															X
	County of San Diego	X			X												X
San Diego Bay	Coronado	X			X				X		X		X	X	X		X
	Port of San Diego	X			X				X		X		X	X	X		X
San Diego River	Caltrans	X									X						X
	City of El Cajon	X									X						X
	City of La Mesa	X	X								X						X
	City of Santee	X	X								X			X			X
	City of San Diego	X						X			X				X		X
	County of San Diego	X							X		X				X		X
San Luis Rey	City of Oceanside	X		X	X									X	X		X
	City of Vista	X			X									X	X		X
	County of San Diego	X	X		X					X	X			X	X		X
	Caltrans	X			X										X		X

WMA	Jurisdiction (or HA)	BMPs	Green Streets	Irrigation control	JRMPs	Think Blue Program	SWPPP	Non-SUSMP (Standard Urban Storm Water Mitigation Plan)	MS4 Infrastructure	Infiltration and Detention Basins	Retrofit and Rehabilitation in Areas of Existing Development	Pesticides, Herbicides, and Fertilizer BMP Program	Road, Street, Parking Lot Structure Projects	Priority Development Projects	Illicit discharge, detection, and elimination	Urban Tree Canopy	Public outreach
Tijuana	Caltrans	X	X		X				X	X	X	X	X		X		X
	City of San Diego	X	X		X				X	X	X	X	X		X		X
	City of Imperial Beach	X	X		X				X	X	X	X	X		X		X
	County of San Diego	X	X		X				X	X	X	X	X		X		X
Santa Margarita*	Caltrans	X															
	County of San Diego																X

*Santa Margarita WQIP still in development so list of strategies may be incomplete

5.4 Three-Step Project Integrated Analysis and Prioritization Process

The integrated analysis and prioritization process is a three-step process that assigns points to projects for addressing benefits in multiple categories (Figure 5-6). The first step of project prioritization is determining eligibility. In order for a project to be considered eligible to be included in the SWRP, it must be an implementation project that includes elements of storm water or dry weather runoff capture, water quality improvement, or beneficial use. A goal of the SWRP is to identify opportunities to enhance utilization of storm water as a resource. Beneficial use of collected storm water and dry weather flows are further assessed in this SWRP to address storm water as a resource. Eligible projects must also meet at least two SWRP benefits. Therefore, one of the two project benefits must include water quality or water resource benefits through storm water or dry weather runoff capture. This SWRP also covers projects that may have habitat restoration, flood management, and water conservation elements and benefits. Implementation projects must also identify the funding source for operations and maintenance for the timeline required in the grant application (Figure 5-7). Most grants (such as Proposition 1) will cover funding of construction, but not operations and maintenance costs. Proposition 1 eligibility requires that operations and maintenance funding already be secured, since SWRCB, among others, is not supportive of implementing a project if an entity does not have the means to operate and maintain that project. After a project is determined eligible, the project is evaluated against a series of criteria for each benefit category addressed by the project to meet the eligibility under Step 1. Points are assigned for achieving certain benefits (e.g., increasing infiltration or providing urban green space) and providing project metrics (e.g., volume of flow reduced). In Step 3, points are given to projects that have been identified and assessed in a watershed-based plan.

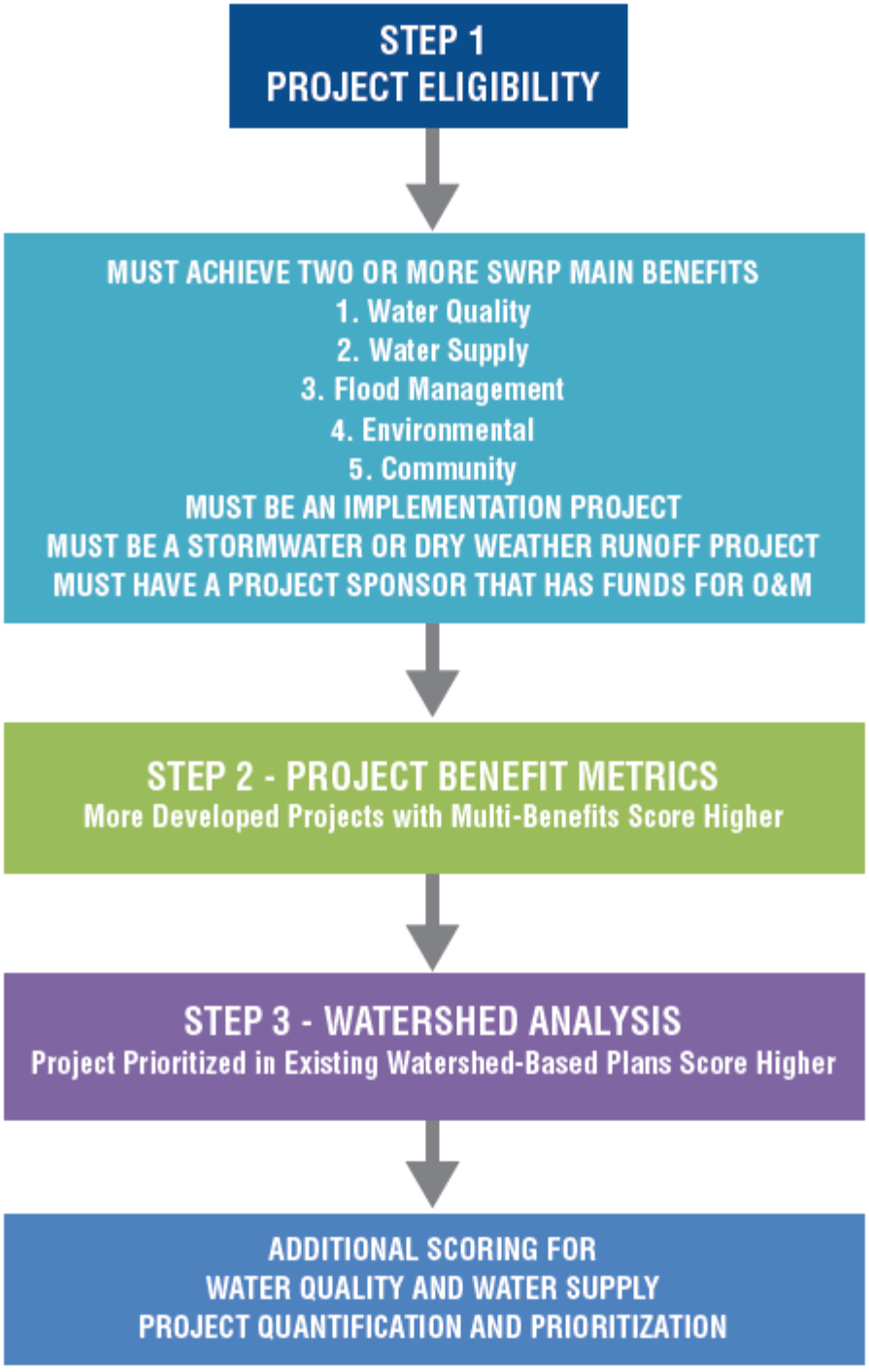


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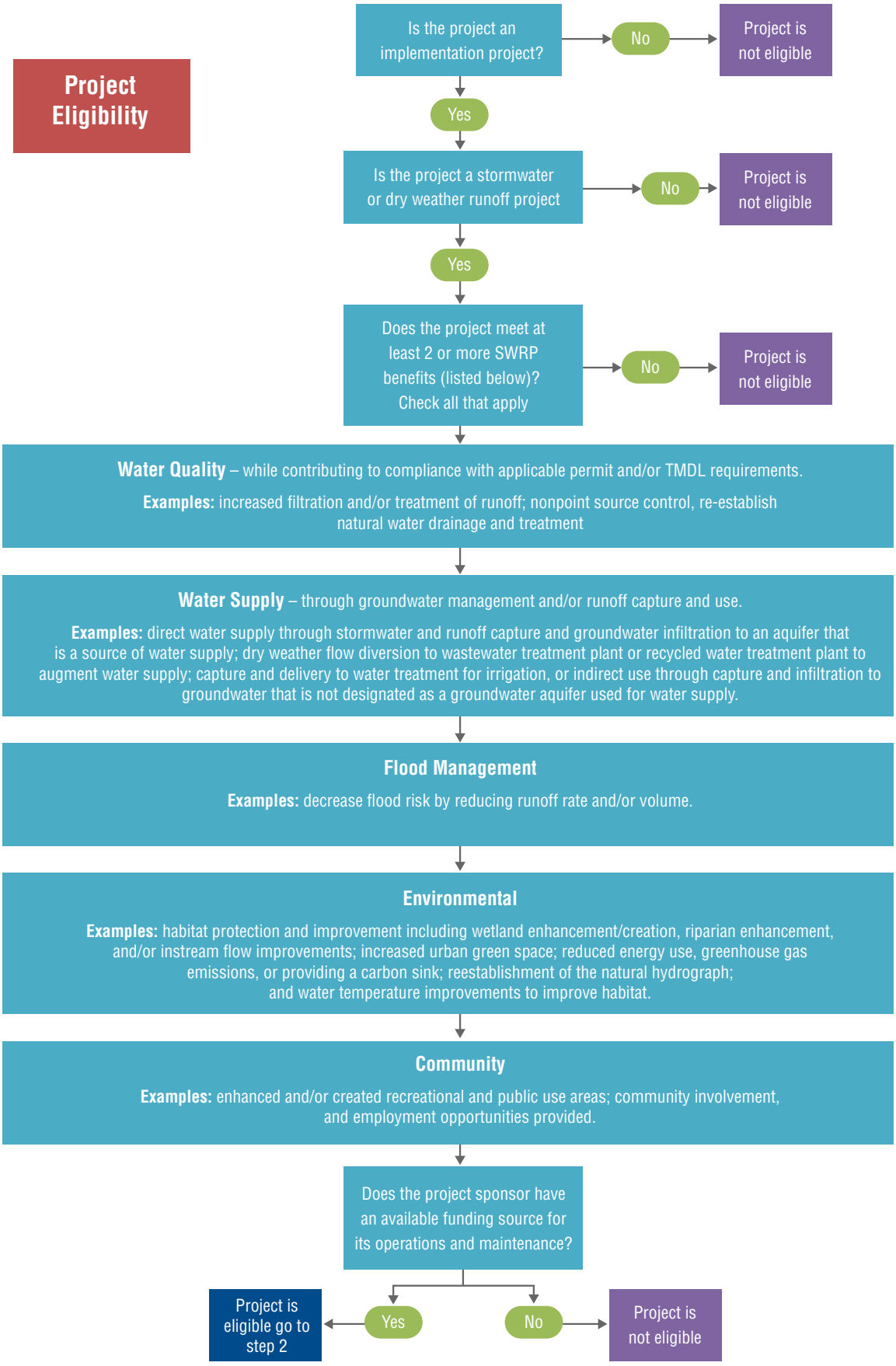
Figure 5-6
Project Prioritization Process



SOURCE: ESA

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Figure 5-7
Project Eligibility Flow Chart

5.4.1 Step 1- Project Eligibility

Proposition 1 funding requires that grant proposals must be for project implementation. Depending on the specific grant criteria, a portion (which varies between grant solicitations) of total project costs may include planning (design, permitting, and environmental assessment). Project sponsors need to check specific grant application requirements for the portions of the requested funding allowable for planning activities. The implementation project must also include as its primary elements storm water or dry weather runoff capture and water quality improvement and/or beneficial use. Eligible projects must also meet at least two SWRP benefits. In order to prioritize projects within the region, projects must provide two or more of the following benefits: water quality, water supply, flood management, environmental, and community (Figure 5-7). Therefore, one of the two project benefits needs to be water quality or water resource benefits through storm water and/or dry weather runoff capture. A project that achieves the water quality benefit would contribute to water quality compliance or address a TMDL requirement. For example, a project could involve stabilizing streambanks in order to reduce sediment loads to comply with a local sediment TMDL. Water supply projects would involve augmenting current water supply by runoff capture and groundwater infiltration to an aquifer for storage. A flood management project would reduce flood risk by reducing rate and or volume of storm flows. A project may provide environmental benefits, such as increasing urban green space, reducing greenhouse gas emissions, or improving creek habitat. Any project that enhances public areas, creates employment opportunities, or helps disadvantaged communities, would be considered to provide a community benefit.

Many projects will naturally fall into multiple benefit categories. For example, a project that involves BMP elements such as bioswales would help re-establish a natural hydrograph, providing flood and environmental benefits, would enhance water quality, and could benefit the community by increasing urban green space. Projects must fall in a minimum of two benefit categories to be eligible, but could potentially have benefits in all five categories.

5.4.2 Step 2- Project Benefit Metrics

For each benefit addressed, the project may receive up to 40 points: 20 points from the project benefit metrics (Step 2) and 20 points from the watershed analysis (Step 3, Section 5.4.3). Applicants are to complete the checklist provided in Appendix F (available through the OPTI system) to determine which benefits are applicable and how many points their project should receive. Appendix G provides the worksheets available in the OPTI system for further information on how to determine and calculate project benefits. An excel-based calculator has been developed to assist project sponsors with calculating some of their water supply, flood management, and environmental benefits. This calculator is available on the San Diego IRWM website here: http://www.sdirwmp.org/2017-swrp.

All of the five benefit categories have a total possible score of 40 points each (combined Steps 2 and 3 score) with the exception of the water supply category. In the case of the water supply benefit, additional “bonus points” are possible above the total 40 points under Step 2. These additional bonus points have been assigned to the water supply benefit because the SWRP Guidelines and grant funding emphasize the beneficial use of captured storm water and dry

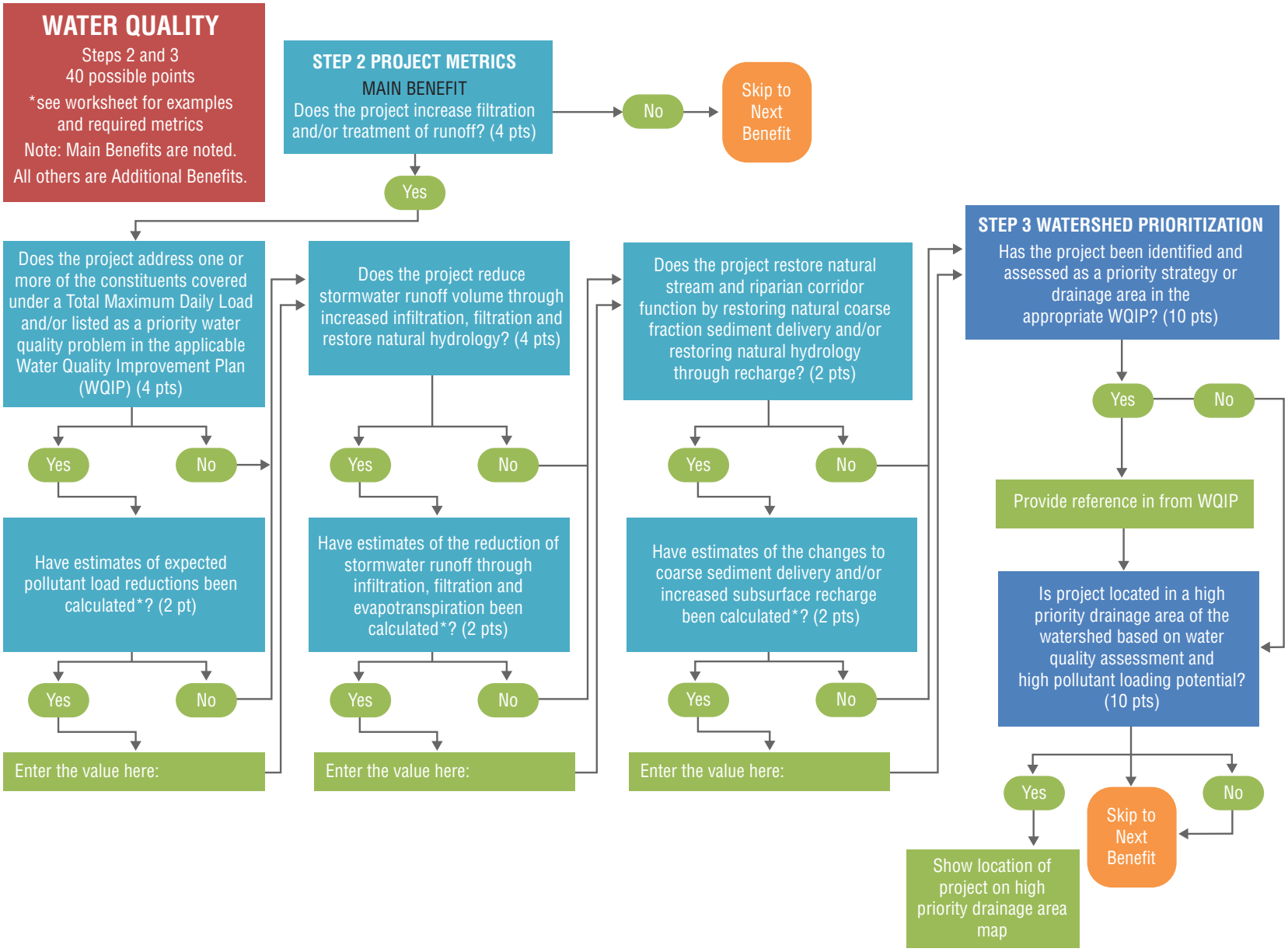
weather flows. Projects that achieve water supply benefits can be assigned bonus points above the 20 points for project benefit metrics (Step 2) by addressing more than one type of beneficial use of captured storm water and dry weather flows. For example, a project will receive bonus points when it captures storm flows and both directs these flows to infiltration to a groundwater aquifer that is used for potable water supply, and is used to irrigate and sustain a wetland habitat enhancement. Additional examples are provided in Section 5.4.2.2.

5.4.2.1 Water Quality

The main benefit of a water quality project is increasing filtration or treatment of runoff to reduce pollutant loading to local creeks, rivers, estuaries, and the ocean. Additionally, a project could receive more points for including secondary benefits, such as addressing a high priority water quality condition as defined in the applicable TMDL or WQIP, restoring natural hydrology by reducing storm water runoff, and restoring natural sediment transport by reducing storm water runoff or sediment delivery. Figure 5-8 provides a flow chart that illustrates the water quality checklist questions in Appendix F.

Bioretention basin example project

An example of a project that would receive the full 20 points for water quality is a potential bio-retention and infiltration basin located upstream of the Los Peñasquitos Lagoon. The potential project consists of a bioretention and infiltration basin that would receive storm water and dry weather flows from a drainage area with residential, commercial, and open space land uses. Storm water and a portion of dry weather flows would enter the bioretention through a bioswale. The project would reduce excess sediment loading, peak flows, and dry weather runoff volume through retention, infiltration, filtration, and evapotranspiration. Water quality conditions that are identified as high priorities in the WQIP include excess sediment loading to the lagoon, hydromodification, and perennial dry weather flows from the watershed. The bio-retention and infiltration basin and bioswales are designed to capture storm flows offline from Los Peñasquitos Creek and retain the storm flows to allow for sediment to settle out, which would reduce sediment loading to the lagoon. The bio-retention basin would also provide infiltration and evapotranspiration of a portion of the storm and dry weather flows. The bioretention basin and bioswale are designed to retain the 85th percentile design storm to provide measurable sediment removal. The bioretention basin outlet is also designed to meet the hydromodifcation requirements to reduce the peak flow and peak flow duration and reduce the impact of downstream hydromodification.



SOURCE: ESA

SWRP . 160618

Figure 5-8

Water Quality Benefit Flow Chart

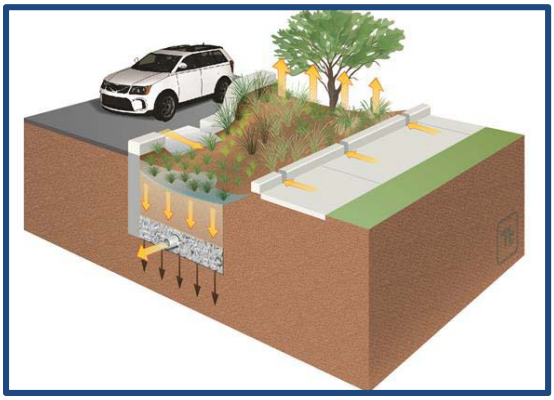
The project would receive a total of 14 points under Project Metrics (Step 2), as it increases filtration and infiltration to remove pollutants (4 points), including the high priority water quality condition of excess sediment to the lagoon under the Sediment TMDL (4 points); restores the natural hydrology by reducing storm water runoff peak flows and volume through infiltration, filtration, and evapotranspiration (4 points); and, restores natural stream function with increasing infiltration and subsurface retention time (2 points). The project would receive the full 20 points under Project Metrics (Step 2) if calculations are completed and quantities provided for sediment load reduction, storm water volume reduction (restoring natural hydrology), and the increased subsurface retention time. Example calculations to determine the quantifiable measurements of the water quality benefits are provided in Appendix G for the following:

- Worksheet #3: Water Quality Benefit – Pollutant Load Reduction
- Worksheet #5: Water Quality Benefit – Restore Natural Hydrology (Volume Reduction)
- Worksheet #7b: Water Quality Benefit – Subsurface Retention Time

This project would provide additional flooding and environmental benefits that will be discussed in Section 5.4.2.3 and 5.4.2.4, respectively.

Green street example project

Another example of a type of project that is eligible under the SWRP is a programmatic green street project. A programmatic project is one that covers numerous similar projects that are planned for implementation in a priority drainage area or sector of the watershed. For this example, the programmatic green street project is proposed in the San Diego River Watershed to meet the water quality goals for the WQIP. The programmatic green street project consists of implementing multiple green streets to achieve a portion of the required percent of fecal indicator bacteria (FIB) load reduction stated in the TMDL and in the WQIP for the watershed. The green streets would reduce FIB loading through filtration and infiltration using bioretention along the rights-of-way of the streets. Storm water would be directed into these bioretention cells and strips along the roadway and allowed to infiltrate through filter media and either further infiltrate to subsoils or to underdrains connected to the storm drain system, where applicable. Porous pavement and pavers may be used to increase runoff filtration and infiltration. The programmatic green street project would be implemented over a multi-year period per the implementation strategy in the WQIP.



Green street example project

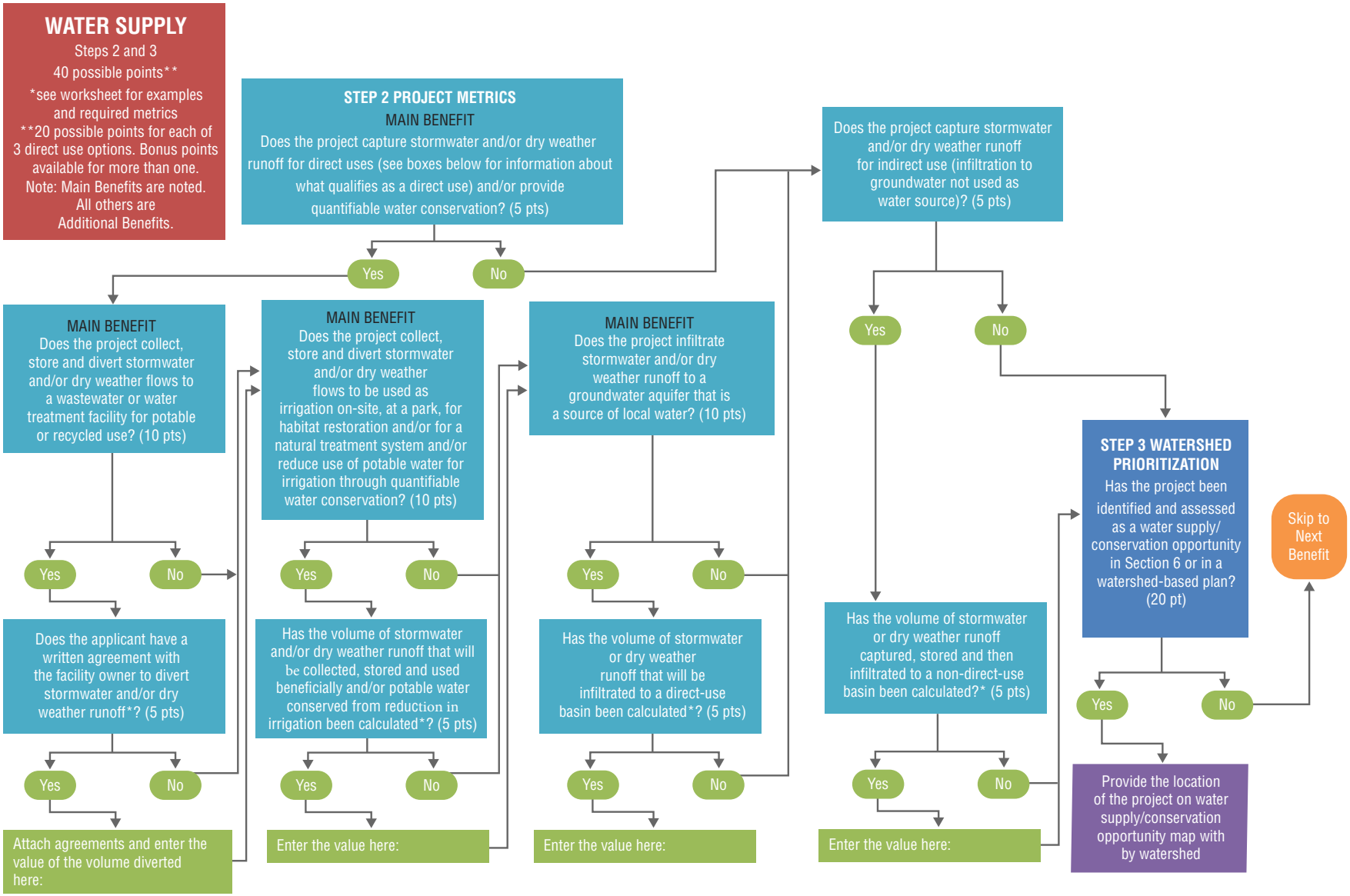
The programmatic project increases filtration and infiltration to remove pollutants (4 points), including the high priority water quality condition, FIB, under the Bacteria TMDL (4 points); restores the natural hydrology by reducing storm water runoff peak flows and volume through infiltration, filtration, and evapotranspiration (4 points); and restores natural stream function with increasing infiltration and subsurface retention time (2 points) for a total of 14 points. The project would receive the full 20 points if calculations are provided for bacteria load reduction, storm water volume reduction (restoring natural hydrology), and increased subsurface retention time. Example calculations to determine the quantifiable measurements of the water quality benefits are provided in Appendix G. This project would provide additional flooding and environmental benefits that will be discussed in Sections 5.4.2.3 and 5.4.2.4.

5.4.2.2 Water Supply

The main benefit of a water supply project is the capture of storm water or dry weather runoff for direct use. There are three ways a project can use storm water and dry weather flows for direct use. The first is the diversion of flows to a wastewater or water treatment facility that is then treated and used for recycled water or indirect potable use. The second is collecting and storing flows for irrigation at a nearby park or golf course, for a habitat restoration project, or through a natural treatment system that also provides wetland habitat. Direct use also can be achieved through the infiltration of storm water to a groundwater aquifer that is a source of local supply. Additional points can be earned by a project if the applicant includes calculations of volume of storm water and runoff storage volumes, and agreements with the necessary facility owners to divert and use the captured storm water or dry weather flows for recycled water or potable use. If the project has multiple methods to directly use flows, it can score "bonus points" above the base 20 points. Figure 5-9 provides a flow chart that illustrates the water supply checklist questions in Appendix F.

An example programmatic project is regional water conservation via turf replacement and a downspout disconnect program for residences and commercial properties. It is a programmatic project because it includes multiple implementation projects over a number of watersheds, all of which have similar goals, benefits, and project metrics. Water conservation via turf replacement is an IRWM project that was proposed for an implementation grant (RWMG, 2013). Under the Water Supply Benefit, this programmatic project would provide quantifiable water conservation (5 points). The programmatic project would score an additional 10 points for reducing potable water use for irrigation through quantifiable water conservation. If the project sponsors also provided the volume of potable water conserved, an additional 5 points would be awarded for a total of 20 points under the Project Metrics (Step 2). Example calculations to determine the quantifiable annual volume of water that is conserved are presented in Appendix G with additional examples calculations of quantifiable measurements of the water supply benefits for the following:

- Worksheet #12: Water Supply Benefit – Approved Flow or Volume Diverted for Beneficial Use
- Worksheet #14a: Water Supply Benefit – Volume Stored and Volume to Beneficial Use
- Worksheet #14b: Water Supply Benefit – Volume of Water Conserved
- Worksheet #16/18: Water Supply Benefit – Volume Infiltrated to Groundwater



SOURCE: ESA

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Figure 5-9
Water Supply Benefit Flow Chart

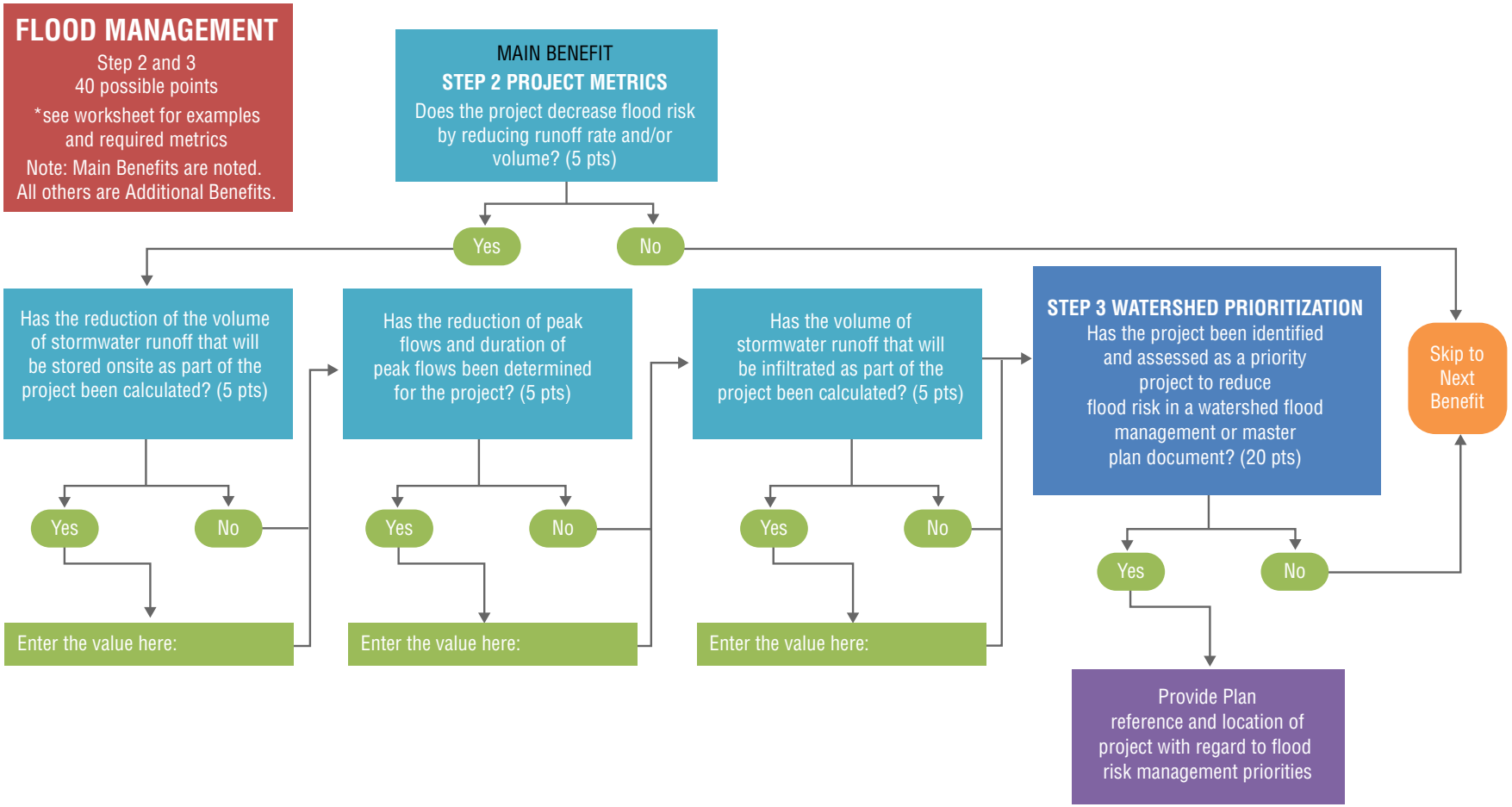
An example of a project that could score bonus points above 20 points is the Safari Park Drought Response and Outreach project (DWR, 2015). The project proposes capturing dry weather and storm runoff in a pond (5 points). Water from the pond would then be treated for reuse as on-site irrigation (10 points). The project proposal includes calculations of how much water will be stored and used and, therefore, scores 5 additional points. Additionally, the project involves updating a wastewater treatment facility at the park. If the storm water and dry weather flows from on site could be recycled for beneficial use, the project would receive an additional 10 points. Since the project sponsor operated the treatment facility (agreement with operator already secured), the project could gain another 5 points for a total of 35 potential points. The project could score points in the community category as well for providing hands-on water education and conservation programs.

5.4.2.3 Flood Management

The main benefit of flood management projects is decreasing flood risk by reducing the runoff rate and/or volume, thereby reducing impacts of flooding on private property and public facilities and infrastructure. Additional points are awarded for projects that have calculated the volume of storm water stored on site, the reduction of peak flows, and infiltration volume. Figure 5-10 provides a flow chart that illustrates the flood management checklist questions in Appendix F.

There are two types of flood management projects. The first addresses large flow, low frequency events. These projects, such as flood plain restoration, can reduce the peak flow of a storm and increase retention time. Worksheet #21 in Appendix G provides example calculations to quantify peak flow reduction from flood event management projects.

The second type of project that falls into the flood management benefit category addresses low flow, high frequency storms. Flood management projects focus on reducing peak flows and damage to property, while most of the low flow projects benefit primarily from water quality control. However, projects that fall in this category, such as green streets, also can contribute to flood management by peak storm flow attenuation. Many of these projects fall into the environmental benefit category as well; hydromodification projects fall into both environmental and flood management categories as these projects protect and restore natural hydrology by retaining and controlling storm flow discharges to mimic predevelopment conditions. Worksheet #22/23 in Appendix G describes the process for quantifying reduction in annual flow.



SOURCE: ESA

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Figure 5-10

Flood Management Benefit Flow Chart

An example of a multi-benefit flood control project is the Woodside Avenue Water Quality Basin, a San Diego County Flood Control Grant Project. This project includes a flood control retention basin that was retro-fitted with a low-flow vegetated channel to filter runoff. The BMP was designed to prevent Woodside Avenue, in San Diego County near Lakeside, from seasonal flooding. The detention basin can control water volumes for up to a 100-year storm (1 percent chance of annual occurrence). This project would receive 20 points in Step 2: 5 points for reducing runoff rate and volume, 5 points for quantifying the runoff control, 5 points for quantifying the reduction in peak flows, and 5 points for quantifying the increase in infiltration at the site. This project could also receive points in the water quality and community categories. Appendix G provides example calculations of quantifiable measurements for flood management benefits in the following worksheet:

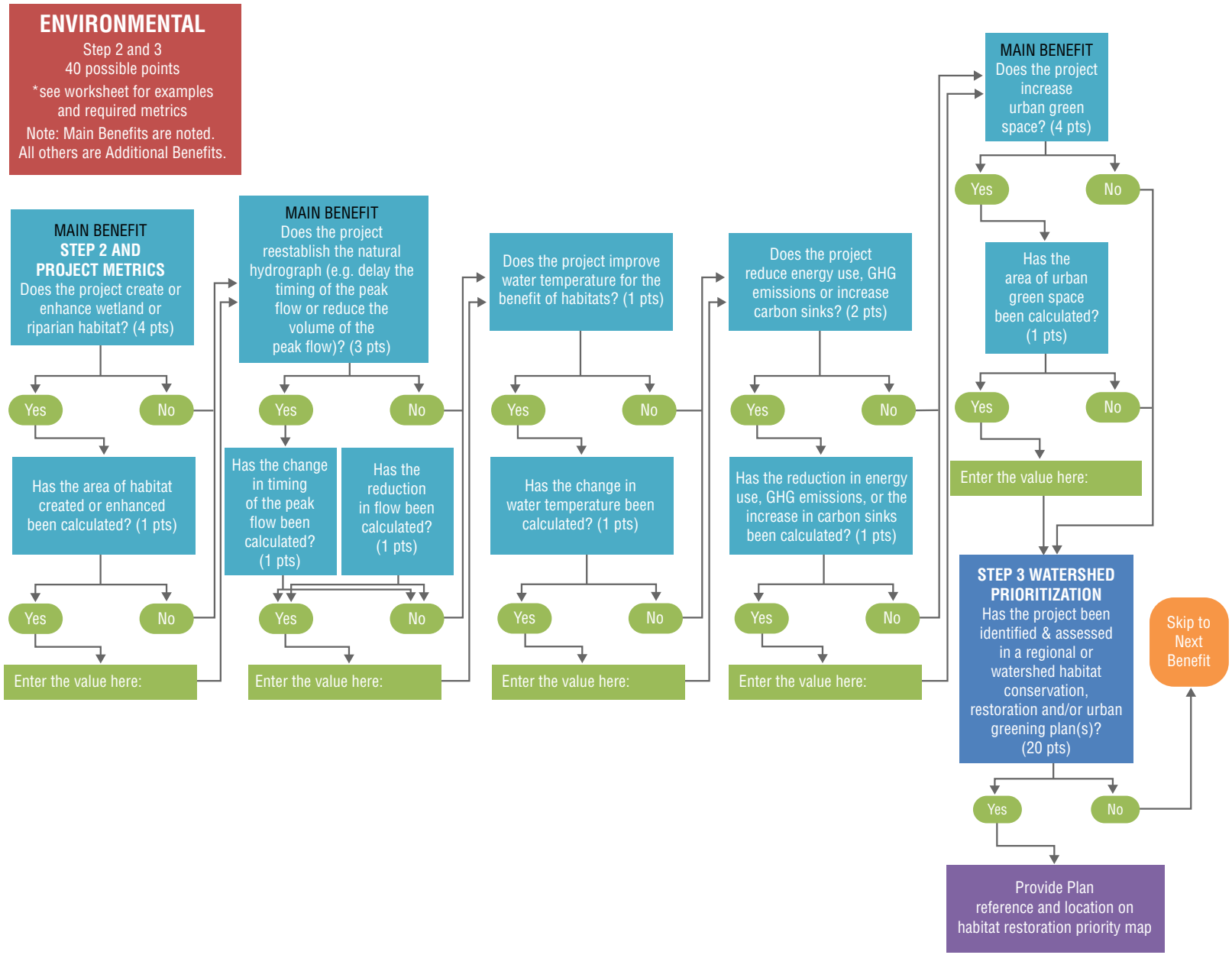
Flood Control Retention Basin Example Project

- Worksheet #21: Flood Management Benefit – Reduction of Peak Flows and Duration
- Worksheet #22: Flood Management Benefit – Volume of Infiltration
- Worksheet #23: Flood Management Benefit – Volume of Runoff Reduced

5.4.2.4 Environmental

There are three main benefits under the environmental benefit category: enhancement of wetland or riparian habitat, re-establishment of the natural hydrograph, and an increase of urban green space. Secondary benefits include improving water temperature for the benefit of habitats, reducing energy use and greenhouse gas (GHG) emissions, or increasing carbon sinks. Projects can receive additional points for quantifying the environmental improvements due to the project. Figure 5-11 provides a flow chart that graphically illustrates the environmental checklist questions in Appendix F.

An example of a multi-benefit environmental project is the Murphy Canyon Creek and Flooding project proposed by the San Diego River Park Foundation. Murphy Canyon Creek is an artificial drainage channel that often floods during storm events. The San Diego River Park Foundation has proposed re-engineering the channel to establish a more natural flow pattern and provide additional habitat. This project would achieve many of the environmental benefit criteria. The project would create new habitat along the creek (4 points) and re-establish the natural hydrograph (3 points). The project also involves creating a 3-acre neighborhood park, which contributes to urban green space (4 points), for a total of 11 points. If the area of created habitat and urban green space were calculated along with the change in timing of the peak flow and the flow reduction, the project could receive an additional 4 points, for a total of 15 points.



SOURCE: ESA

SWRP . 160618

Figure 5-11
Environmental Benefit Flow Chart

To receive the full 20 points, the project could further demonstrate water temperature benefits (e.g., through shading of the water by willows) and an increase in carbon sinks (through increased vegetation). This project could also score in flood management benefit because it reduces flood risk. Further benefit categories that may be applicable to this project include community through creation of additional community recreational space and public education. Example calculations to determine the quantifiable measurements of the environmental benefits are presented in Appendix G for the following:

- Worksheet #28: Environmental Benefit – Peak Flow Reduction and Reduction of Time Duration of Peak Flow
- Worksheet #33: Environmental Benefit – GHG Emissions Reduction

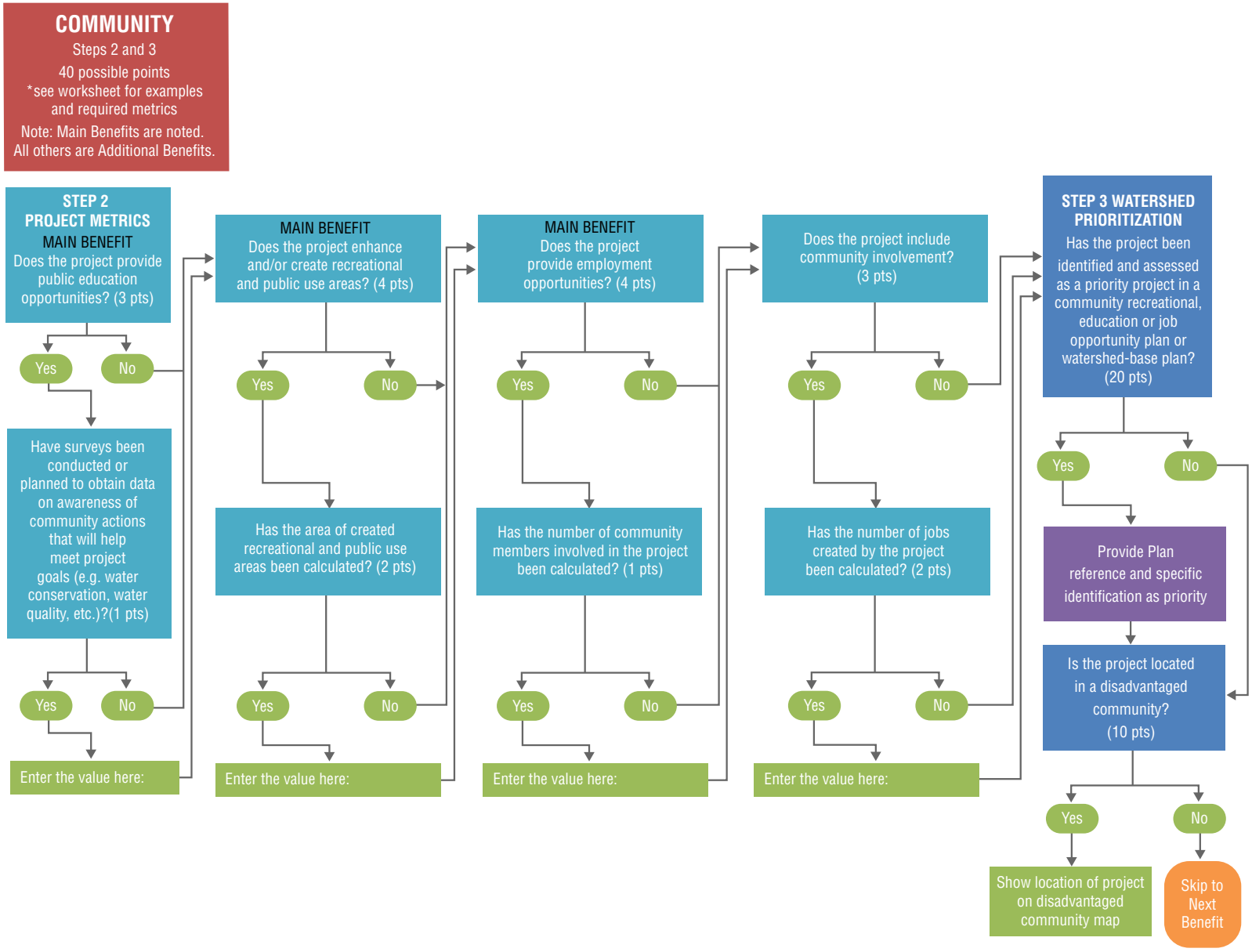
5.4.2.5 Community

The main community benefits a project can provide include public education, enhancing or creating recreational and public use areas, and providing employment opportunities. A secondary benefit is community involvement in the project. Projects can receive additional points for quantifying these benefits and providing calculations of additional recreational and public use areas, number of jobs created, and number of community members involved. A project that provides public education opportunities will receive points for conducting surveys or collecting data on awareness of community actions that will help meet project goals. Figure 5-12 provides a flow chart that illustrates the community checklist questions in Appendix F.

The San Diego River Healthy Headwaters Restoration Project in the IRWM work plan meets some community benefit criteria. The main goal of this project is to restore and rehabilitate sites in the San Diego River watershed and improve habitat, water supply, and water quality. However, this project would also score in the community benefit category by enhancing public spaces and maintaining trails at the El Capitan Reservoir (4 points), which involves community volunteers through San Diego River Park Foundation (3 points). The US Forest Service would set up kiosks at 4 sites where the public could learn about water-wise gardening and how to minimize watershed impacts and fire risks (3 points). The project also receives points for calculations of the restored public area acreage (2 points). This restoration project would also score in the environmental and water quality categories.

5.4.3 Step 3- Watershed Analysis

Step 3 of the integrated analysis and prioritization process is the watershed analysis. As projects are compared on a watershed basis, the regional constraints and opportunities are considered and provide a level playing field for all projects. As discussed under Section 5.1, existing and future watershed and regional planning documents are used for project identification and prioritization. Under this analysis projects receive higher scores when they have been ranked in an existing watershed or regional plan and if they have been identified as a priority on a watershed basis in such a plan.



SOURCE: ESA

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Figure 5-12
Community Benefit Flow Chart

Projects could get up to 20 additional points under each benefit category for being identified as a priority in an existing watershed or regional planning document. These management plans could either be one described in Section 5.1, or another region- or watershed-based prioritization plan. Any future plans that detail goals under a specific category and outline a prioritization method may be considered as well. A project will be assigned 10 points for being ranked by one of these plans and will receive an additional 10 points for being identified as a priority project or strategy in a plan.

In the community benefit category, a project can get 5 points for being identified in the community plan, and an additional 5 points for being a priority project in that plan. A project can achieve the remaining 10 points if it is located in a disadvantaged community.

For example, the programmatic project presented previously—the regional water conservation via turf replacement and downspout disconnect program—would receive 20 points under the watershed prioritization (Step 3) for the water supply benefit. It would receive these points since it is included in the 2013 IRWM Plan. This programmatic multi-benefit project would gain further points under the water quality benefit watershed prioritization (Step 3) if the down spout disconnect program were listed as a priority watershed strategy to meet pollutant load reduction goals.

Another example of the scoring process for the watershed prioritization (Step 3) is shown in Table 5- 3 for the programmatic green street project previously presented in Section 5.4.2.1. The programmatic green street project consists of implementing multiple green streets to achieve a portion of the required percent of FIB load reduction stated in the TMDL and in the WQIP for the watershed. The green streets would reduce FIB loading through filtration and infiltration using bioretention along the right of ways of the streets. Storm water would be directed into these bioretention cells and strips along the roadway and allowed to infiltrate through filter media and either further infiltrate to subsoils or to underdrains connected to the storm drain system where applicable.

Green street example project

As presented in Table 5-2, under Step 1, the project is eligible because it achieves two or more benefits, is an implementation project, and the project sponsor has the means to maintain the project. The benefits that are achieved by this programmatic project include water quality through increased runoff treatment, water supply by increasing infiltration to groundwater, flood management by reducing the volume of runoff and reducing peak flows, environmental by increasing urban green space, and community through a public education program on water quality and water conservation.

TABLE 5-2
EXAMPLE GREEN STREET PROGRAMMATIC PROJECT – COMPLETE CHECKLIST PROCESS AND SCORING

Checklist Step/Benefit	Step 1 Eligibility	Step 2 Project Metrics	Step 3 Watershed Analysis	Total Score
Water Quality	✓ Increases Runoff Treatment	14 points - Reduces TMDL pollutants & runoff volumes	20 points – Priority in WQIP & located in high loading area	34 points
Water Supply	✓ Increases Groundwater Recharge	10 points – infiltrates to groundwater non-direct use	Not located in groundwater aquifer and recharge area	10 points
Flooding	✓Decreases Flood Risk	20 points – reduces flood risk & metrics calculated	20 points – located in high risk flood area	40 points
Environmental	✓ Increases Urban Green Space	5 points – increases urban green space	20 points – identified as high priority in watershed plan	25 points
Community	✓Provides Public Education	4 points – signage and outreach for public education	20 points – identified as high priority in outreach opportunity	24 points
Results/Score	Meets 2 Or More Benefits	55 points	80 points	135 out of 200 points

Under Step 2, the project metrics criteria, scores are provided under each of the five benefits. Under the water quality benefit (see Figure 5-8): the programmatic project increases filtration and infiltration to remove pollutants (4 points), including the high priority water quality condition, FIB, under the Bacteria TMDL (4 points); restores the natural hydrology by reducing storm water runoff peak flows and volume through infiltration, filtration, and evapotranspiration (4 points); and restores natural stream function with increasing infiltration and subsurface retention time (2 points) for a total of 14 points. The programmatic project is identified as a high priority watershed strategy in the WQIP, and is located in a high priority sector of the watershed thereby achieving a score of 20 points under Step 3, watershed prioritization. Under the water quality benefits, the total score is 34 points.

Under the Step 2 project metrics for the water supply benefit (see Figure 5-9), the project captures storm water and dry weather flows and infiltrates a portion of the volume captured to the groundwater (5 points). Calculations for the amount of volume captured and infiltrated have been completed and provided (5 points) for a total of 10 points under Step 2. The project is not a priority water supply/water conservation project in regional or watershed plans, and therefore does not receive points under Step 3, watershed prioritization. The total score under the water supply benefit is 10 points.

Under the Step 2 project metrics for the flooding management benefit (see Figure 5-10), the project decreases flood risk by reducing the volume of runoff (5 points). Calculations and

quantifiable measurements have been provided for volume of runoff reduction, the reduction of peak flows, and the volume that will be infiltrated, for an additional 15 points. The total for Step 2 is therefore 20 points. The project is located within a flood-prone sector of the watershed and identified as a priority for flood risk reduction in jurisdictional flood management plans, thereby scoring 20 points under Step 3, watershed prioritization. The total score under the flood management benefit is 40 points.

For the Step 2 project metrics for the environmental benefit (see Figure 5-11), the project increases urban green space, and the area created is provided, for a total of 5 points. The project is located within neighborhoods that have been identified as a priority for increasing urban green space in local planning and climate actions plans, thereby scoring 20 points under Step 3, watershed prioritization. The total score under the environmental benefit is 25 points.

Finally under the Step 2 project metrics for the community benefit (see Figure 5-12), the project provides public education opportunities (3 points) and would include surveys to obtain data on community awareness of the importance of water conservation and water quality for an additional 1 point, for a total of 4 points. The project is located within neighborhoods that have been identified as a priority for educational outreach on water conservation and water quality in regional and watershed plans, thereby scoring 10 points under Step 3, watershed prioritization. Additionally, the project is in a disadvantaged community, for an extra 10 points. The total score under the environmental benefit is 24 points.

The total combined score for the programmatic green street project is 135 out of a total possible score of 200 points. The project provides multiple benefits and scores well for meeting the criteria under all five benefits.

5.5 Project Quantification and Prioritization

Completion of the SWRP checklist (Section 5.4) by responding to all the applicable questions, results in a total score under each benefit. Scores are tallied for each of the main benefits and totaled for an overall score. The SWRP project list uses the total score of each project to rank each project on a watershed and regional basis. This integrated analysis and prioritization method provides a quantification of the project benefits and encourages the development of multi-benefit projects that most effectively meet watershed goals as measured through defined project metrics.

5.5.1 Additional Quantification and Ranking of Project with Water Quality Benefits

In addition to the quantification through project scoring by completing the online OPTI checklist, projects are further quantified and ranked based on the larger set of water quality strategies in the WQIPs and storm water capture and use opportunities identified in the public parcel assessment presented in Section 5.2 and Appendix H of this document. This additional analysis and ranking provide a quantifiable prioritization of listed projects based on the level of benefit provided compared to the collective set of opportunities in each watershed to meet the overall watershed goals. The goals for water quality are presented in the WQIPs, as discussed in Section 5.3.

For listed projects that have water quality as a main benefit, the additional quantitative analysis and ranking is based on confirmation that the project is addressing a high priority water quality condition per the WQIP, quantification of the water quality benefits have been provided, and these quantitative benefits have been compared to the range of quantities for priority constituents and volume reductions. Projects are then ranked using color coding in addition to the overall OPTI checklist score to provide a quantitative analysis at the project and regional level. This additional quantitative ranking is summarized in Table 5-3.

TABLE 5-3
ADDITIONAL QUANTIFICATION OF WATER QUALITY BENEFITS FOR LISTED SWRP PROJECTS

Basis for Quantification	Criteria for Quantification Ranking	Rank	Color Score
1. Meets the stated requirements under Watershed Prioritization – Questions 8 and 9[1] in the OPTI checklist 2. Quantities have been provided for the amount of pollutant load reductions achieved in lbs/yr or MPN/yr, and volume of storm water and/or urban runoff reduce in gallons/yr[2] 3. Based on the quantities provided , the project ranks in either the upper, middle or lower range of quantifiable water quality benefits that have been prioritized per the applicable WQIP	Meets #1 and #2 and ranked in the higher range of quantifiable benefits	Highest Benefit	
	Meets #1 and #2 and ranked in the middle range of quantifiable benefits	High Benefit	
	Meets #1 and #2 and ranked in the lower range of quantifiable benefits	Medium Benefit	
	Meets #1 but no quantities have been provided	Lower Benefit	

#8: Has the project been identified and assessed as a strategy associated with high priority water quality conditions in the applicable WQIP that has been listed as a key strategy to meet a define interim and/or final water quality goal?
#9: Is the project located in a high priority drainage area of the watershed based on priority water quality assessment and high pollutant-loading potential?
See questions #3 and #4 in OPTI checklist in Appendix F

The quantities provided for each project through the OPTI checklist are compared to the set of projects listed to quantitatively evaluate the project. Projects are ranked highest when the quantifiable benefits are in the upper 30 percent. The other ranking categories are presented in Table 5-3. These quantities relate to the watershed priorities, as the projects that are ranked must be strategies that are associated with high priority water quality conditions per the applicable WQIP. The quantities provided demonstrate the level of water quality benefit provided to meet the goals of the applicable WQIP. As presented in Section 5.3, the WQIPs present the analysis of the overall reductions these prioritized strategies achieve toward the interim and final goals. The projects listed in the SWRP are provided in Appendix I. The listed projects include scores from the OPTI checklist and also additional quantification ranking using the criteria and color score shown in Table 5-3.

5.5.2 Additional Quantification and Ranking of Project with Water Supply Benefits

The additional quantification of projects is also conducted for listed projects that have water supply as a main benefit. All listed project are scored by completing the online OPTI checklist,

which provides a quantifiable analysis of the project metrics and watershed analysis that was presented in Section 5.4. Projects with water supply as a main benefit are further quantified and ranked based on a comparison with the larger set of water supply opportunities presented in Section 5.2 and Appendix H. This additional analysis and ranking provide a quantifiable prioritization of listed projects compared to the collective set of opportunities in each watershed to meet the overall goal. The goal for storm water capture and use is to maximize the quantity of storm water and dry weather urban runoff that can be feasibly captured and used beneficially based on the parcel assessment and identification of opportunities presented in Section 5.2 and Appendix H.

For listed projects that have water supply as a main benefit, the additional quantitative analysis and ranking is based on confirmation that the project hast been identified and assessed as a water supply/conservation project opportunity on a watershed basis in Section 5.2 and Appendix H of this document or in a watershed-based plan, and prioritized based on the quantification of the benefits achieved. The projects are also ranked based on whether the quantification of the water quality benefits has been provided in the OPTI checklist under the Project Metrics. These quantities include volume of storm water and dry weather urban runoff that would be captured and stored, and the quantities that would be used beneficially. Finally, the project quantities are compared to the range of volumes stored and used beneficially for the larger set of opportunities identified and quantified as part of the public parcel assessment presented in Section 5.2 and Appendix H. Projects are then ranked using color coding in addition to the overall OPTI checklist score to provide a quantitative analysis at the project and regional level. This additional quantitative ranking is summarized in Table 5-4 and will be integrated into the online OPTI checklist such that future project listings will also have this additional quantification and ranking.

TABLE 5-4
ADDITIONAL QUANTIFICATION OF WATER SUPPLY BENEFITS FOR LISTED SWRP PROJECTS

Basis for Quantification	Criteria for Quantification Ranking	Rank	Color Score
1. Meets the stated requirements under Watershed Prioritization – Question 19[1] in the OPTI checklist 2. Quantities have been provided for the amount of storm water and/or urban runoff that is captured and stored, and then used beneficially for the options presented in Project Metric step in acre-feet/yr..([2]) 3. Based on the quantities provided, the project ranks in either the upper, middle or lower range of quantifiable water supply benefits compared to the set of water supply opportunities identified and quantified in the parcel assessment in Section 5.2 and Appendix H.	Meets #1 and #2 and ranked in the higher range (upper 30%) of quantifiable benefits	Highest Benefit	
	Meets #1 and #2 and ranked in the middle range (middle 30%) of quantifiable benefits	High Benefit	
	Meets #1 and #2 and ranked in the lower range (lower 30%) of quantifiable benefits	Medium Benefit	
	Meets #1 but no quantities have been provided	Lower Benefit	

#19: Has the project been identified and assessed as a water supply/conservation project opportunity on a watershed basis in Section 6 or in a watershed-based plan, and prioritized based on the quantification of the benefits achieved in AF/yr.? 2 –see questions #14, 16, and 18 in OPTI checklist provided in Appendix F

The quantities provided for each project through the OPTI checklist are compared to the annual volumes quantified for the larger set of water supply projects developed through the parcel assessment to quantitatively evaluate each project. Projects are ranked highest when the quantifiable benefits are in the upper 30 percent; the other ranking categories are presented in Table 5-3. The projects listed in the SWRP are provided in Appendix I. The listed projects include the scores from the OPTI checklist. The quantification ranking using the criteria and color score is shown in Table 5-4. This additional color ranking of water supply projects will be integrated into the online OPTI checklist such that future project listings will also have this additional quantification and ranking.

5.5.3 SWRP Listed Projects

The current list of SWRP projects that have been assessed and prioritized using the quantitative scoring from the OPTI checklist and the additional quantification ranking for water quality and water supply project in this SWRP are presented in Appendix I. These projects include projects for Rounds 1 and 2 of the SWRCB Storm Water Grant funding (Round 2 solicitation is expected in Spring 2018). The project list will be continually updated using the online regional project integrated analysis and prioritization tool (Section 5) as more projects are submitted or existing projects are updated.

Future projects will be identified and developed through existing, updated, and new watershed and regional planning documents. The project sponsors will complete the most updated version of the project checklist using the online system. These projects will undergo assessment, scoring, and inclusion in an updated project list on the online system. This SWRP is therefore adaptive to updates and modifications to watershed and regional goals in existing and new planning documents through the online process established for this SWRP.

5.5.4 IRWM Project List

The OPTI database includes a list of projects that have been submitted under the IRWM Program. The list of IRWM projects is provided in Appendix I. These projects have not undergone the quantitative assessment and prioritization process. During the preparation of this SWRP, a request for projects was announced to a range of stakeholders including the IRWM (see Chapter 2) to submit projects for eligibility and analysis using the online OPTI checklist. As this is an open and on-going project list, IRWM-listed project sponsors may at any time enter their projects into the SWRP list through the online checklist to become SWRP-eligible. Project eligibility, quantification, and prioritization are performed by entering projects through the OPTI SWRP checklist as presented in this chapter.

5.6 Data Management

To be part of this SWRP, project applicants must submit project details through the online SWRP checklist posted on the publicly accessible OPTI system (Section 5.6.1). The OPTI system provides projected benefit data prior to project implementation. Post-implementation data will be collected and reported by the project applicants in accordance with project plans and grant agreement requirements (Section 5.6.2).

5.6.1 Projected Project Benefits – OPTI Tool for SWRP and San Diego IRWM

Storm water and dry weather runoff projects to be scored and prioritized in the SWRP are entered through the OPTI[1] tool, an online and publicly accessible database system. OPTI has been in place for several years and has been the primary tool for project solicitation for the San Diego IRWM Program (see www.sdirwmp.org). OPTI was modified in 2016 to allow for use as part of this SWRP. When a project sponsor enters a project through OPTI, he/she can select to include the project in the San Diego IRWM Plan, the SWRP, or both documents. If the user selects to include the project in the SWRP, it will be prioritized and scored as described in Section 5.4: via OPTI, the project sponsor completes the SWRP project checklist and receives a score based on the projected benefits and metrics. The prioritized project list summarizes the projects in the SWRP that are scored and ranked (Appendix I).

Users can enter projects through OPTI at any time, regardless of whether there is a specific call for projects. Once a project is added into OPTI, it will remain on the list of projects indefinitely. Therefore, the project list can be continually updated and project information can be modified as projects are further developed, benefits are quantified, or details change. This results in OPTI providing a "living list" of projects. The current project list as of the March 2017 output for storm water and dry weather runoff projects is included in Appendix I. For a current list, generated by OPTI, contact sdirwm@woodardcurran.com. In addition to the flexibility that OPTI provides by allowing users and stakeholders to enter projects into the IRWM Plan, SWRP, or both, it also provides other useful features, such as maps, so that users can view other projects within the region to determine potential synergy or collaboration opportunities.

The OPTI system collates estimated project benefits before construction and monitoring of the project occurs. The data submitted into the OPTI system would help Copermittees assess the potential progress that each project would make toward WMA goals. However, OPTI data would not assess project performance.

5.6.2 Post-Implementation Project Data

Collection and management of post-implementation project data covered under the planning documents, discussed in Section 5.1, is conducted in accordance with the applicable regulations, permits, ordinances, and policies under these plans. For example, the MS4 permit requires Copermittees to "assess and report the progress of the water quality improvement strategies… towards reducing pollutants in storm water discharges from the MS4s…" (Provision D.2.a) including:

[a] Identifying reductions or progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses and/or drainage areas discharging from the Copermittees' MS4s in the WMA;

1 The OPTI database is accessible at this link: http://irwm.rmcwater.com/sd/login.php

[b] Assessing the effectiveness of water quality improvement strategies being implemented by the Copermittees within the WMA toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the WMA to the MEP, with an estimate, if possible, of the pollutant load reductions attributable to specific water quality strategies implemented by the Copermittees; and

[c] Identifying modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Copermittees in the WMA toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the WMA to the MEP. (Provision D.4.b.(2)(c)(iii))

After a project is constructed, project data collection and reporting is the responsibility of the project sponsor in accordance with the Project Assessment and Evaluation Plan (PAEP), Quality Assurance Project Plan, and Monitoring Plan, where applicable. Data collection and management at the project level is the responsibility of the project sponsor in accordance with the approved project plans and grant agreement.

The WQIPs provide approaches to data management and making data accessible to the public for use to update data gaps, strategies, and timelines, as applicable. Data collection may be on a jurisdictional, watershed, or regional basis depending on the requirements of the WQIP. More detailed information on data collection and management is provided in the WQIPs.

CHAPTER 6
Implementation Strategy and Schedule (SWRP Guidelines Section VI.E)

SWRP Checklist Guidelines

- ☒ Plan identifies resources for Plan implementation, including: 1) projection of additional funding needs and sources for administration and implementation needs; and 2) schedule for arranging and securing Plan implementation financing.
- ☒ Plan projects and programs are identified to ensure the effective implementation of the storm water resource plan pursuant to this part and achieve multiple benefits.
- ☒ The Plan identifies the development of appropriate decision support tools and the data necessary to use the decision support tools.
- ☒ Plan describes implementation strategy, including:
  a. Timeline for submitting Plan into existing plans, as applicable;
  b. Specific actions by which Plan will be implemented;
  c. All entities responsible for project implementation;
  d. Description of community participation strategy;
  e. Procedures to track status of each project;
  f. Timelines for all active or planned projects;
  g. Procedures for ongoing review, updates, and adaptive management of the Plan; and
  h. A strategy and timeline for obtaining necessary federal, state, and local permits.
- ☒ Applicable IRWM Plan: The Plan will be submitted, upon development, to the applicable integrated regional water management group for incorporation into the IRWM Plan.
- ☒ Plan describes how implementation performance measures will be tracked.

This chapter summarizes implementation of the SWRP, including schedule, implementation strategy, and performance tracking. As this SWRP draws from existing regional and watershed plans to provide a functionally equivalent SWRP, the implementation strategy efforts for this plan build upon those existing efforts, which include the IRWM Plan, WQIPs, and other relevant plans referenced in this document.

6.1 Resources for Plan Implementation

Implementation of the SWRP began with the development and prioritization of strategies and projects through the existing planning documents that comprise this functionally equivalent SWRP. This document collates regional multi-benefit storm water and dry weather flow capture projects from various plans, and will also include future projects that are submitted to the online database. Implementation activities include the call for projects to develop the project list included in this SWRP, the completion of the SWRP checklist, and listing and ranking of the projects. The SWRP implementation will continue as additional projects are developed or updated and submitted through the online project database (OPTI) that is managed via the IRWM website. The SWRP project list will continually be updated as applicants submit new projects and update existing projects when additional data and project details become available. The online SWRP checklist will be automated to re-score and rank the project list on a watershed and regional basis. This will ensure watershed and regional goals are achieved effectively by implementing prioritized multi-benefit projects.

The San Diego IRWM Program will maintain the online project database to serve both the IRWM and the SWRP processes through June 2019. Future calls for projects will be advertised through the existing IRWM stakeholder list. At this time, it has not been decided how future project database administration

(beyond June 2019) will be funded. Implementation of projects under the SWRP will follow the implementation strategies for the relevant plans within which each project is listed, as discussed below in Section 6.4.

Implementation of projects that are currently listed in the SWRP and future projects that will be submitted via the online database, will vary based on the participation of each project sponsor in grant solicitations as they become available, and as projects are awarded funding. Funding for implementation could come through SWRCB Prop 1 Storm Water Grant Program grants (Round 1 and Round 2), grants through conservancies, DWR IRWM funding, urban greening programs, and others.

6.2 Plan Implementation and Achievement of Multiple Benefits

The implementation of this SWRP achieves multiple benefits through the integrated analysis and prioritization of projects submitted using the checklist for inclusion on the SWRP list. In order to be considered an eligible project for the SWRP process, a project must be a storm water project that achieves multiple benefits. The more benefits that a project provides, the higher it will score through the checklist process. Therefore, the scoring and ranking process encourages project sponsors to develop and submit projects and programs that achieve a greater number of benefits.

The scoring and ranking of the SWRP project list is done on a watershed and regional basis to allow for comparison of projects on these scales. The quantification of benefits for each project is defined through the project metrics listed in the SWRP checklist. Projects that demonstrate quantitatively greater benefits will score higher, which will result in projects with measurably better effects being prioritized.

It is anticipated that each grant application process and grant agreement will require project sponsors to monitor and assess the benefits achieved by their projects, such as development and implementation of a PAEP. A PAEP defines the quantifiable measurements or metrics that will be used to assess the project's effectiveness in meeting the anticipated multi-benefit goals. This SWRP provides tools to develop the key elements of the PAEP required for SWRCB grant applications that will define the project-specific goals, measurements, and monitoring to demonstrate that multiple benefits are achieved.

6.3 Decision Support Tools and Supporting Data

The SWRP checklist supports the integrated analysis of projects and provides a basis to prioritize projects based on the multiple benefits the projects would achieve. The project information provided as part of the checklist may be updated based on specific grant application requirements. Chapter 5 provides more detailed discussion of the SWRP checklist tool and the data that supports it.

6.4 Implementation Strategy, Timelines, and Tracking

The implementation strategy for this SWRP includes allowing for continual project list updates through additions and modifications to the existing project list. In addition, calls for projects specific to current and anticipated grant solicitations under Prop 1 and other potential funding sources will be conducted in order to update the SWRP project list and to identify multi-benefit storm water projects that may specifically address a grant program's scoring criteria and goals. Inclusion on the SWRP list requires completion of the checklist, which encourages the development and prioritization of multi-benefit projects for grant funding.

When the solicitation for Round 2 of the Prop 1 Storm Water Grant Program is announced, which is anticipated to occur in Spring 2018, project sponsors may update information previously submitted to OPTI or submit new projects for inclusion on the list. Future calls for projects would be announced prior to new grant solicitations as they are made available, and the online checklist and SWRP project database would then be available as tools to further assess, rank, and encourage multi-benefit projects for funding to meet the watershed and regional goals defined in the planning documents that comprise the SWRP.

These planning documents include their own goals, strategies to meet the identified goals, and schedules or potential timelines for implementing these strategies to meet interim and long-term goals. For example, the WQIPs include water quality goals for meeting interim and final pollutant load reductions under a TMDL (corresponding to a high priority water quality condition). Numeric goals have been developed in the WQIPs to measure progress toward addressing the highest priority water quality conditions. Numeric goals may take a variety of forms, but must be quantifiable so that progress toward and achievement of the goals are measurable. Each highest priority water quality condition may include multiple criteria or indicators. In accordance with the MS4 Permit and applicable regulatory drivers, final goals and reasonable interim goals have been developed in the WQIPs (see Section 5.3). Implementation of projects under the SWRP will therefore, follow the implementation strategy for the associated plans.

Project development, selection, and implementation will be the responsibility of the project sponsors and associated stakeholders. The SWRP encourages collaboration between agencies and stakeholders within each watershed, and regionally, in the development of multi-benefit projects. Development of the WQIPs has established the agreements and structure for collaboration and input from stakeholders within each WMA. The WQIPs present a summary of the compliance analysis results to demonstrate the anticipated progress toward achieving the interim and final goals. The WQIPs also provide schedules to demonstrate progress toward achieving the interim and final numeric goals.

In addition to the WQIPs, the IRWM Plan provides regional goals, strategies, and implementation schedules for multi-benefit projects that have a greater focus on water resources. The IRWM Plan includes an Implementation Action Plan for regional priorities. As this and other regional and watershed plans are updated, the goals, strategies, and implementation schedules will be updated. As these plans comprise this SWRP, such updates will be reflected in the projects that are developed and submitted for ranking and listing through the online SWRP checklist. Further discussion of SWRP updates and adaptive management is presented in Chapter 7.

A portion of the implementation strategy will be the responsibility of the project sponsor or responsible agency, including the following:

- Obtaining project permits.
- Complying with CEQA and NEPA, as required.
- Implementing the project.
- Tracking the implementation and effectiveness of the projects and strategies identified in the planning documents, permits, or grant agreements (if the project is funded by a grant).
- Completing necessary reporting to comply with applicable permits or grant agreements.

CHAPTER 7

Process for Plan Updates, Program Assessment, and Adaptive Management (SWRP Guidelines Section VI.E)

SWRP Checklist Guidelines

- ☒ The Plan identifies the development of appropriate decision support tools and the data necessary to use the decision support tools.
- ☒ Plan describes implementation strategy, including:
  - ☒ Procedures for ongoing review, updates, and adaptive management of the Plan; and
  - ☒ Plan describes how implementation performance measures will be tracked.

This chapter describes the process for updating the SWRP and the approach to adaptively manage the plan as existing plans are updated and future planning documents that have specific goals and timelines to meet watershed-based goals and implementation strategies are prepared. In addition, updates may be completed when new storm water-related funding sources become available.

7.1 SWRP Updates and Adaptive Management

Updates to this SWRP will largely occur through the project submittal and evaluation process outlined in Chapter 5 of this plan, which includes completing the checklist for scoring and inclusion on the SWRP project list. Figure 7-1 presents the process for current and future project prioritization and inclusion in the SWRP. Anticipated updates to the SWRP checklist used to evaluate and score projects will be completed, as applicable, to reflect specific evaluation criteria in future grant solicitations. As presented in Figure 7-1, this SWRP establishes a prioritized project list by watershed for the second round of SWRCB Prop 1 storm water grant funding. As grant solicitations are announced, the SWRP project checklist may be updated prior to call for projects and updates to the SWRP project list.

Proposition 1 funds for multi-benefit storm water projects will be available through two solicitations or "rounds" of funding. Approximately, $80 million of Proposition 1 funds were available to fund implementation projects during the first solicitation (Round 1), which were awarded in the Fall of 2016. An additional approximately $86 million will be available to fund implementation projects during the second solicitation (Round 2) and will likely be distributed in the Spring of 2018. Preparation of this SWRP was initiated to identify and prioritize projects within the region in compliance with the requirements of Round 1 and Round 2 funds. The SWRP project checklist in Chapter 5 is based on SWRP funding solicitations, and may not be applicable to funding source solicitations that become available in the future. These include future rounds of SWRP funding for individual applicants or through the IRWM Program and conservation agency funding for projects that have a water quality or storm water capture element. As new funding sources become available, the project checklist will be evaluated and

updated as necessary. Updates to the project checklist, scoring, and project lists will be completed through the regional OPTI database established for the San Diego IRWM Program and used for this SWRP. Updates to the written SWRP are not anticipated.

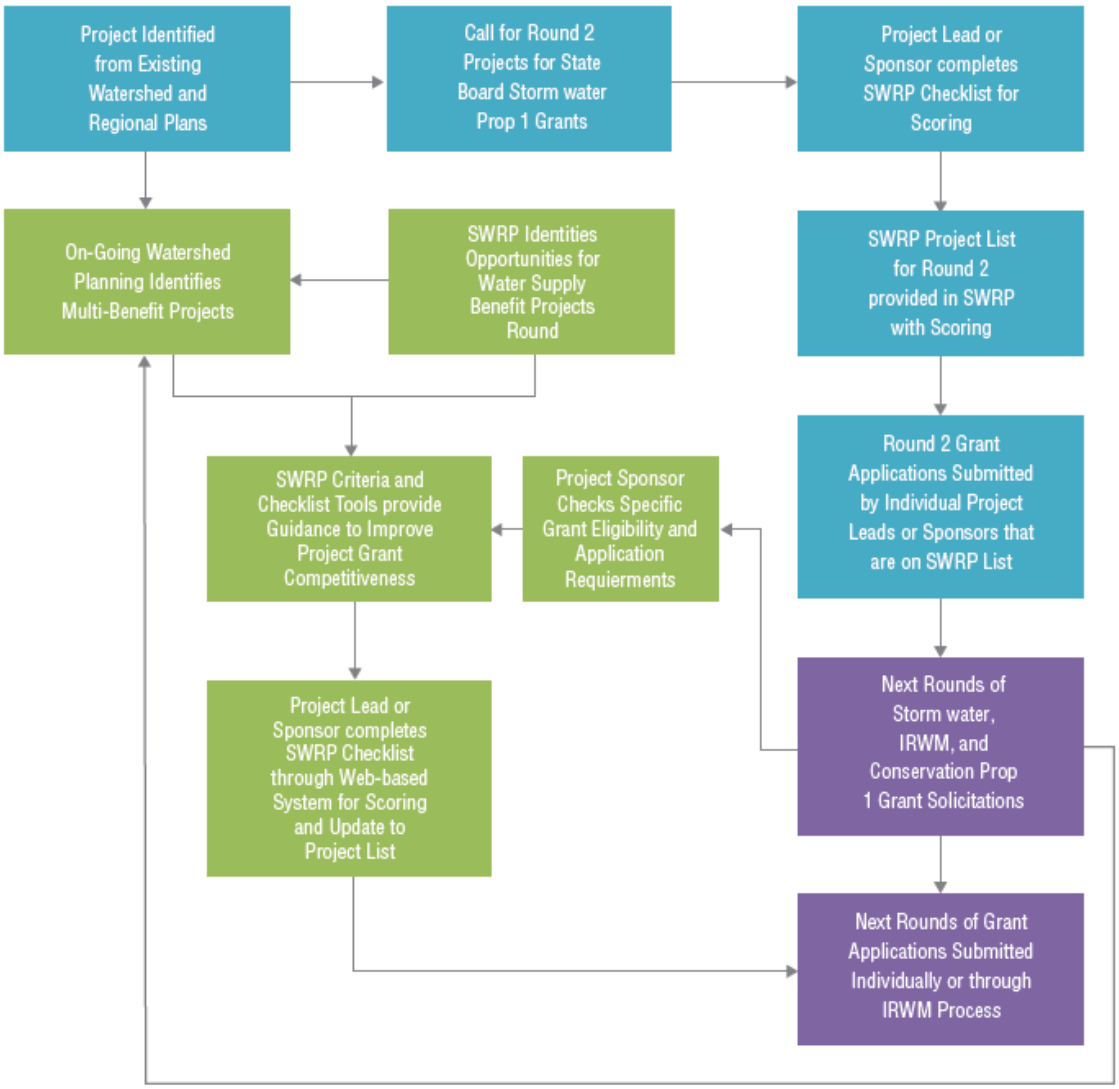

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Figure 7-1
Funding Process for Current and Future Project Submittal for SWRP Listing and SWRP Checklist Updates

As presented in Figure 7-1, future projects (those not included in the current project list, which was focused on meeting criteria for Round 1 and Round 2 of the Storm Water Grant Program) will be identified and developed through updates to existing plans or the development of new plans. Individual or regional applicants will complete the most updated version of the project checklist using the online OPTI system, and the projects will undergo assessment, scoring, and inclusion in an updated project list online. The current project list, included in Appendix I, is based on the call for projects for Round 2 of the Proposition 1 Storm Water Grant Program and evaluation and scoring using the current checklist. However, future project lists will be based on updated calls for funding and an updated checklist, if needed. This SWRP is, therefore, adaptive to updates and modifications to watershed and regional plan goals, project identification, and development based on new data, changes in conditions, and new regulations.

The OPTI system has been in place for several years, and was created for the San Diego IRWM Program.[1] The database provides an online system where interested parties can input projects for inclusion in the IRWM Plan. In the Fall of 2016, the OPTI system was modified to include a list of projects for the SWRP. The OPTI system provides a "living list" of projects such that users can continuously update their projects or add new projects. These projects will be included in either the IRWM Plan or SWRP, or the user can select to have the project in both planning documents. This flexibility allows regional stakeholders to add new projects as they are identified and developed, modify projects to maximize integration and benefits, and include projects for funding consideration. In addition, the OPTI database also provides other useful features, such as maps, so that users can view other projects within the region to determine potential synergy or collaboration opportunities. In this way, the OPTI database is considered a regional resource for stakeholders that can be used to integrate project opportunities throughout the San Diego region.

After users log into the system, they can select the type of grant funding (either IRWM Program or Stormwater Grant Program, or both) for which they would like their project to be eligible. From there, users must input a certain amount of project information (required fields) for the projects to be included in either planning document. Once projects have been entered into the system, the projects will remain on the list of projects indefinitely.

7.2 Tracking of Performance Measurements

The process for tracking performance measurements to assess the effectiveness of grant-funded projects to meet the benefit criteria listed in the SWRP checklist will be conducted by the project sponsor for individual grant applications. Project effectiveness assessment, monitoring, and reporting will need to meet specific grant solicitation and grant agreement requirements. The SWRP checklist includes criteria and additional scoring for the quantification of benefits using specific metrics. Higher scoring provides an incentive for applicants to further develop projects and to quantify benefits using the metrics and worksheet provided with the checklist. As the completed checklists for projects are entered electronically in the OPTI system, performance measures for each project will be recorded and be part of the project database. Future updates to these quantitative measurements may be completed and tracked as projects are further developed

1 The OPTI database is accessible at this link: http://irwm.rmcwater.com/sd/login.php

and checklists and project scoring are updated. For example, a project that is at a conceptual stage may not have quantitative measurements of benefits when first entered in the OPTI database. In order to increase the scoring of a project for future grant funding, a project may be further developed to provide such data, and the checklist input could be updated to achieve a higher scoring and prioritization.

As funded projects are implemented, quantification of benefits per the listed metrics may become available as the design is completed and implementation performance measures are monitored and reported per the specific grant requirements, plans, and agreements. A PAEP is required for projects applying for SWRCB grants (including Round 2 of the Storm Water Grant Program), which entails the following requirements:

a) Identify targets appropriate for the benefits claimed, with emphasis on the benefits that are obtainable using the requested grant funds;

b) Discuss the proposed measurement methods needed to evaluate project performance and progress toward meeting the targets;

c) Describe any monitoring activities proposed, parameters and frequency of monitoring, and how the data will be integrated into California Environmental Data Exchange Network; and

d) Describe whether the proposal leverages existing monitoring efforts.

The SWRP checklist provides a basis for the development of the PAEP as it lists the quantifiable measurements and metrics in which to measure project effectiveness in achieving its benefits. The measurement and reporting of project-specific targets, as outlined in the PAEP, will be done according to the specific grant program and requirements by the project sponsor.

Tracking of completion of projects and meeting benefit targets will be done at the watershed and regional plan level through updates to these plans, where applicable. For example, completion and achievement of water quality goals to meet TMDL and MS4 Permit targets will be documented in annual reporting and updates to the WQIPs. These updates will result in updated targets and identification of projects that will then feed into the process outlined in Figure 7-1.

In addition, projects that are funded through the IRWM Program are tracked through the IRWM Grant Administrator. Once projects are complete, the project sponsor is required to provide a close-out report to the San Diego IRWM stakeholder group (the RAC) to inform other stakeholders about important lessons learned and outcomes of the project. After projects are completed, sponsors are also required to complete annual reporting to the DWR to track updates on project progress, and how well projects are performing with respect to their anticipated benefits.

ACRONYMS AND ABBREVIATIONS

Act	Stormwater Resource Planning Act
AF	Acre-feet
ARG	Agricultural supply beneficial use
ASBS	Areas of Special Biological Significance
Basin plans	Water Quality Control Plans
BIOL	Biological habitats of special significance beneficial use
BLM	Bureau of Land Management
BMP	Best management practice
COMM	Commercial, and sport fishing beneficial use
CSD	Community Services District
DAC	Disadvantaged community
DWR	California Department of Water Resources
EJ	Environmental justice
EST	Estuarine habitat beneficial use
FIB	Fecal Indicator Bacteria
GHG	Greenhouse gas
gpm	Gallons per minute
Guidelines	Storm Water Resource Plan Guidelines
HA	Hydrologic area
HSA	Hydrologic subarea
HU	Hydrologic unit
ID	Irrigation District
IFMP	Integrated Flood Management Plan
IRWM	Integrated Regional Water Management
JRMP	Jurisdictional Runoff Management Program
LID	Low impact development
LTEA	Long Term Effectiveness Assessment
MAR	Marine habitat beneficial use
MCL	Maximum contaminant level

Metro	Metropolitan
mg/L	Milligram per liter
MGD	Million gallons per day
MHCP	Multiple Habitat Conservation Program
MS4	Municipal separate storm sewer systems
MSCP	Multi-Species Conservation Plan
MWD	Municipal Water District
NCTD	North County Transit District
NGO	Non-governmental organization
NOLF	Naval Outlying Field
NPDES	National Pollutant Discharge Elimination System
OPTI	Online Project Tracking and Integration
PAEP	Project Assessment and Evaluation Plan
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PUD	Public Utilities District
RAC	Regional Advisory Committee
RCWD	Rancho California Water District
REC-1	Water contact recreational beneficial use
RWMG	San Diego Regional Water Management Group
San Diego SWRP	San Diego Region Functionally Equivalent Storm Water Resource Plan
SB	Senate Bill
SCWRP	Southern California Wetlands Recovery Project
SDCWA	San Diego County Water Authority
SDRWQCB	San Diego Regional Water Quality Control Board
SHELL	Shellfish harvesting beneficial use
SWCFS	Storm Water Capture Feasibility Study
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SWRP	Storm Water Resource Plan
TDS	Total dissolved solids
TMDL	Total maximum daily load
TSS	Total suspended solids
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USMC	United States Marine Corps
WARM	Warm freshwater habitat beneficial use

WD	Water District
WMA	Watershed Management Area
WMAA	Watershed Management Area Analysis
WQE	Water Quality Equivalency
WQIP	Water Quality Improvement Plan
WURMP	Watershed Urban Runoff Management Plan

REFERENCES

Amec Earth and Environmental, Inc. (AMEC). 2005. Los Peñasquitos Watershed Management Plan. March 2005. Available: http://www.projectcleanwater.org/pdf/pen/wmp_los_penasquitos-final.pdf

Amec Foster Wheeler Environment & Infrastructure, Inc. (AMEC) 2015a. San Dieguito River Watershed Management Area Water Quality Improvement Plan. Submitted by the City of San Diego, City of Solana Beach, City of Escondido, City of Del Mar, City of Poway, and the County of San Diego. September 2015.

AMEC. 2015b. Los Peñasquitos Watershed Management Area Water Quality Improvement Plan and Comprehensive Load Reduction Plan. Submitted by City of San Diego, County of San Diego, City of Poway, Caltrans. September 2015.

AMEC. 2016. Mission Bay Watershed Management Area Water Quality Improvement Plan. Submitted by City of San Diego and Caltrans. February 2016.

Anchor Environmental CA, L.P. 2005. Santa Margarita River Watershed Management Plan. Prepared for County of San Diego. March 2005. Available: http://www.projectcleanwater.org/pdf/smg/smrwmp_3-10-05.pdf

California Department of Water Resources (DWR). 1967. Ground Water Occurrence and Quality: San Diego Region. Bulletin No. 106-2. 235 p.

California State Water Resources Control Board (SWRCB). 2010. Final 2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report). August 4, 2010.

California Environmental Protection Agency. 2017. San Diego Regional Water Quality Control Board website. Accessed February 15, 2017. Available at: http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/.

City of Oceanside. 2017. Available: https://www.ci.oceanside.ca.us/gov/water/; accessed on January 11, 2017

City of San Diego (CSD). 2010. Mission Bay and La Jolla Watershed Urban Runoff Management Program. Available: http://www.projectcleanwater.org/pdf/wurmp/mb_lj_wurmp_ar_fy09_10_report.pdf

Cole, K.L., and Wahl, E. (Cole and Wahl). 2000. A late Holocene pollen record from Torrey Pine State Reserve, California: Quaternary Research, v. 53, p. 341-351.

CSD. 2011a. San Diego Low Impact Development Design Manual. July 2011. Available at https://www.sandiego.gov/sites/default/files/lidmanual_0.pdf; accessed on October 21, 2016.

CSD. 2011b. 2010 Watershed Sanitary Survey. Prepared by the Public Utilities Department

CSD. 2012a. City of San Diego, 2002-2012. Point Loma Wastewater Treatment Plan. Available: http://www.sandiego.gov/mwwd/facilities/ptloma/index.shtml; accessed on June 26, 2012.

CSD. 2012b. City of San Diego, 2002-2012. North City Water Reclamation Plant. Available: https://www.sandiego.gov/mwwd/facilities/northcity.shtml; accessed on July 17, 2012.

CSD. 2012c. Reservoirs-Barrett Reservoir. Available: http://www.sandiego.gov/water/recreation/reservoirs/barrett/index.shtml; accessed on June 29, 2012.

CSD. 2012d. Reservoirs-Morena Reservoir. Available: http://www.sandiego.gov/water/recreation/reservoirs/morena.shtml; accessed on June 6, 2013

CSD. 2016. Multiple Species Conservation Program (MSCP) Annual Report. Prepared by the Planning Department, June 20, 2016.

DWR. 1975. California's Groundwater Bulletin 118.

DWR. 2003. California's Groundwater Bulletin 118 – Campo Valley Groundwater Basin. October 2003. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-28.pdf

DWR. 2004a. California's Groundwater Bulletin 118 – Batiquitos Lagoon Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/9-22.pdf

DWR. 2004b. California's Groundwater Bulletin 118 – El Cajon Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-16.pdf

DWR. 2004c. California's Groundwater Bulletin 118 – Escondido Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-9.pdf

DWR. 2004d. California's Groundwater Bulletin 118 – Mission Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-14.pdf

DWR. 2004e. California's Groundwater Bulletin 118 – Otay Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-18.pdf

DWR. 2004f. California's Groundwater Bulletin 118 – Pamo Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-24.pdf

DWR. 2004g. California's Groundwater Bulletin 118 – Poway Valley Groundwater Basin. February 2004. Available: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-13.pdf

DWR. 2004h. California's Groundwater Bulletin 118 – San Diego River Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-15.pdf

DWR. 2004i. California's Groundwater Bulletin 118 – San Elijo Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/9-23.pdf

DWR. 2004j. California's Groundwater Bulletin 118 – San Luis Rey Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-7.pdf

DWR. 2004k. California's Groundwater Bulletin 118 – San Marcos Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/9-32.pdf

DWR. 2004l. California's Groundwater Bulletin 118 – San Pasqual Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-10.pdf

DWR. 2004m. California's Groundwater Bulletin 118 – Santa Margarita Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-4.pdf

DWR. 2004n. California's Groundwater Bulletin 118 – Santa Maria Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-11.pdf

DWR. 2004o. California's Groundwater Bulletin 118 – Sweetwater Valley Groundwater Basin. February 2004. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-17.pdf

DWR. 2006 California's Groundwater Bulletin 118 – Tijuana Groundwater Basin. January 2006. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/9-19.pdf

DWR. 2015. San Diego IRWM Implementation Grant Proposal Work Plan, Attachment 3. 2015. Available at: http://www.water.ca.gov/irwm/grants/docs/Archives/Prop84/Submitted_Applications/P84_2015_Implementation/San%20Diego%20County%20Water%20Authority/Att3_2015IRWM_WorkPlan_1of1.pdf

Erickson, John R., and Kingery, Frank A. (Erickson and Kingery). 1983. Hydrogeologic Investigation for Campo Hills Mobile Home Park, San Diego County, California.

ESA. 2016. Conceptual Level Hydraulic/Hydrologic Basis of Design for the Sorrento/Los Peñasquitos Restoration Program Technical Memorandum. Submitted to Chris Gascon, City of San Diego. June 21, 2016

Geosyntec Consultants. 2014a. San Luis Rey Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2014b. Carlsbad Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2014c. San Dieguito Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2014d. Los Peñasquitos Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2014e. Mission Bay and La Jolla Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2014f. San Diego River Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2014g. Tijuana River Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. October 3, 2014

Geosyntec Consultants. 2015. San Diego Bay Watershed Management Area Analysis (WMAA). Prepared for San Diego County Copermittees. April 2015

Izbicki, John A. 1983. Evaluation of the San Dieguito, San Elijo, and San Pasqual Hydrologic Subareas for Reclaimed Water Use, San Diego County, California. U. S. Geological Survey Water-Resources Investigations Report 83-4044. 131 p.

Larry Walker Associates (LWA). 2016a. San Luis Rey River Watershed Management Area Water Quality Improvement Plan. Submitted by City of Oceanside, City of Vista, County of San Diego and Caltrans. September 2015 – revised March 2016.

LWA. 2016b. San Diego River Watershed Management Area Water Quality Improvement Plan. Submitted by City of El Cajon, City of La Mesa, City of San Diego, City of Santee, County of San Diego, and Caltrans. January 2016.

Mikhail Ogawa Engineering (MOE). 2016. Carlsbad Watershed Management Area (WMA) Water Quality Improvement Plan (WQIP), prepared for City of Carlsbad, City of Encinitas, City of Escondido, City of Oceanside, City of San Marcos, City of Solana Beach, City of Vista, and County of San Diego. June 30, 2016.

Project Clean Water (PCW). 2016. Jurisdictional Runoff Management Program Documents. Available at http://www.projectcleanwater.org/index.php?option=com_ content&view=article&id=243&Itemid=211; accessed on October 27, 2016.

Rainbow Municipal Water District. 2017. Available: http://www.rainbowmwd.com/about-our-water; accessed January 2017

Rancho California Water District (RCWD). 2007. Final Integrated Regional Water Management Plan for the Upper Santa Margarita Watershed Planning Region. July 2007.

Regional Water Management Group, (RWMG, 2013) San Diego Integrated Regional Water Management Plan (IRWMP), September 2013.

San Diego Association of Governments (SANDAG). 2009. GIS Digital Boundary Files & Layers, Code Documentation. Accessed at: http://www.sandag.org/resources/maps_and_gis/gis_downloads/downloads/zip/Land/CurrentLand/ludoc.htm#Codes

San Diego Bay Responsible Parties: City of Chula Vista, City of Lemon Gove, National City, Port of San Diego, City of Coronado, City of La Mesa, City of San Diego, Imperial Beach, San Diego County, San Diego County Regional Airport Authority, and Caltrans. 2016. (SDBRP). 2016. San Diego Bay Watershed Management Area Water Quality Improvement Plan – Final Deliverable: Water Quality Improvement Plan. February 2016.

San Diego County. 2008a. Santa Margarita River Watershed Urban Runoff Management Program. March 2008. Available at: http://www.projectcleanwater.org/html/wurmp_santa_margarita.html

San Diego County. 2008b. Carlsbad Watershed Urban Runoff Management Program. March 2008. Available at: http://www.projectcleanwater.org/html/wurmp_carlsbad.html

San Diego County. 2009. Project Clean Water Web Site, Watershed Overview, Available Online: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=2&Itemid=19

San Diego County Water Authority. 2015. 2015 Annual Report. Beyond Drought. Reliable water in an era of change. Available online: http://sdcwa.org/annualreport/2015/sites/default/files/sdcwa_2015_ar.pdf

San Diego Regional Water Quality Control Board (SDRWQCB). 2005. Rainbow Creek Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs), February 9, 2005. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/rainbowcreek.shtml

San Diego River Park Foundation News and Updates. Murphy Canyon Creek and Flooding. http://www.sandiegoriver.org/news.html

San Diego River Watershed Urban Runoff Management Plan (San Diego River WURMP). Project Clean Water. http://www.projectcleanwater.org/html/wurmp_san_diego_river.html

San Dieguito Community Plan. San Diego County General Plan. 1974. Amended June 18, 2014. <www.sandiegocounty.gov/content/dam/sdc/pds/docs/CP/San_Dieguito_Community_Plan.pdf>

SDRWQCB. 2010, Indicator Bacteria: Revised Project I – Twenty Beaches and Creeks in San Diego Region (including Tecolote Creek) Total Maximum Daily Loads (TMDLs), February 10, 2010. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/bacteria.shtml

SDRWQCB. 2012a. Los Peñasquitos Lagoon Sediment Total Maximum Daily Load (TMDL), June 13, 2012.Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/los_penasquitos_lagoon.shtml

SDRWQCB. 2012b. Chollas Creek Total Maximum Daily Load (TMDL), August 14, 2002.Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/chollascreekdiazinon.shtml

SDRWQCB. 2012c. Basin Plan for San Diego, CA. August 28, 2012. Available: http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan. Accessed October 21, 2016.

SDRWQCB. 2013. Regional MS4 Permit (MS4). Order No. R9-2013-0001. San Diego Region. May 8, 2013.

SDRWQCB. 2014. Loma Alta Slough TMDL Phosphorus, June 26, 2014. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/Loma_Alta_TMDL.shtml

SDRWQCB. 2015. California Regional Water Quality Control Board San Diego Region. National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining The Watersheds Within The San Diego Region. Amended November 18, 2015. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/docs/2015-1118_AmendedOrder_R9-2013-0001_COMPLETE.pdf; accessed on October 21, 2016.

SDRWQCB. 2016a. San Diego Region – Total Maximum Daily Loads (TMDLs). Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/index.shtml; accessed on October 21, 2016.

SDRWQCB. 2016b. Adopted TMDLs. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/tmdladopted.shtml; accessed on October 21, 2016.

SDRWQCB. 2016c. TMDLs in Progress. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/tmdlprogress.shtml; accessed on October 21, 2016.

SDRWQCB. 2016d. San Diego Region – Construction Stormwater FAQs. Available at http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/generalfaqs.shtml; accessed on October 27, 2016.

Senate Bill No. 985 (SB 985). Stormwater Resource Planning. California Legislature.

Southern California Wetlands Recovery Project. Available at: http://scwrp.org/ Accessed Oct 25, 2016.

Tetra Tech. 2102. Tecolote Watershed Comprehensive Load Reduction Plan submitted by City of San Diego and Caltrans. July 20, 2012. Available at: https://www.sandiego.gov/sites/default/files/mbljtecoloteclrp.pdf

URS. 2016. Tijuana River Watershed Management Area Water Quality Improvement Plan. Subitted by the City of Imperial Beach, City of San Diego, and County of San Diego March 8, 2016.

Weston. 2011. Long Term Effectiveness Assessment (LTEA) Prepared For: San Diego County Copermittees Urban Runoff Management Programs, June 2011

Weston. 2012. San Diego County Municipal Copermittees 2011-2012 Urban Runoff Monitoring Final Report. 2012. Available: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=80&Itemid=91

White, M.D. and Greer, K.A. (White and Greer). 2006. The Effects of Watershed Urbanization on the Stream Hydrology and Riparian Vegetation of Los Peñasquitos Creek, California. Landscape and Urban Planning, 74(2):125-138, January 2006

Woodside Avenue Project. Department of Public Works. Flood Control Grant Project. http://www.sandiegocounty.gov/content/sdc/dpw/flood/woodside.html