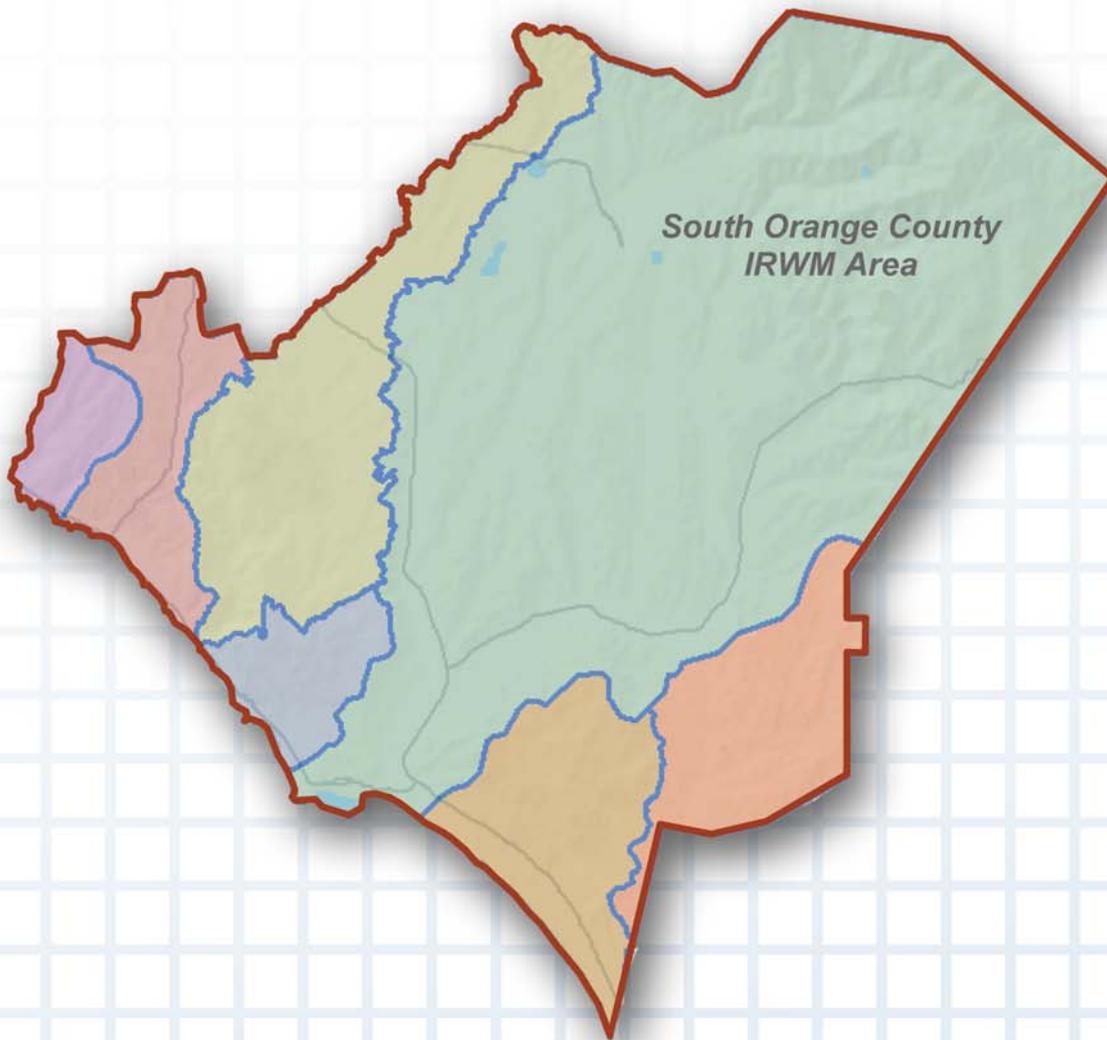


**South
Orange County**
Integrated Regional Water Management Plan



May 2006

**SOUTH ORANGE COUNTY
INTEGRATED REGIONAL WATER
MANAGEMENT PLAN**

2006

“Total Watershed Efficiency”

May 2006

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South Orange County IRWM Plan Updates May 2006

South Orange County IRWM Plan Contacts

Refer to Contacts Page

- Removed City of Newport Beach information, logo and contact information to reflect change that only the southern portion of the Newport Coast Watershed will be included in the South Orange County (OC) region to maintain consistency with RWQCB Region 9.
- Modified the contact information for the City of Laguna Beach from Craig Justice to David Shissler, Director of Water Quality.

Table of Contents

Tables: Page TOC-2

Table I-1 Priority A Projects Summary has been included within the newly added Appendix I South OC IRWM Plan Priority A Project Detail.

Figures: Page TOC-3

- Figures ES-1 and 8 through 12 have been added to Section 3.6 to clearly depict the disadvantaged communities of the entire South OC IRWM Region.
- Former Figures 8 through 11 have been renumbered to Figures 13 through 15 to reflect the addition of the five disadvantaged communities' figures.

Appendices: Page TOC-3

Appendix I South OC IRWM Plan Priority A Project Detail has been added to the Appendix section to clearly demonstrate linkages of Priority A Projects with other projects.

Executive Summary

Region Description: Page ES-2

Revised discussion on the Newport Coast Watershed to reflect change that only the southern portion of the Newport Coast Watershed will be included in the South OC region to maintain consistency with RWQCB Region 9.

Integrated Water Management Group: Page ES-3

- Removed City of Irvine from South Orange County IRWM Group description to reflect the Integrated Coastal Water Management Plan (ICWMP), which included Newport Beach and Region 8. Since the City of Newport Beach project was removed, the City of Irvine also does not have relationship to the projects or Plan.
- Additional statement providing supplementary support about cities, special districts and agencies participating in the development of the South Orange County IRWM Plan.

Figure ES-1 South OC IRWM Region Boundary: Page ES-4

Updated figure to reflect revised South OC IRWM Region boundary for Newport Coast Watershed.

Timeline for Implementation: Page ES-14

Added language to capture the addition of Appendix I South Orange County IRWM Plan Priority A Project Detail.

Chapter 1 Introduction

Introduction: Page 1-1

- Expanded discussion on social and cultural values.
- Expanded discussion on the description of the Region in terms of economic trends in order to add a more descriptive detail about the Region.

Introduction: Page 1-4

Revised discussion on locations of the Areas of Special Biological Significance (ASBS) listing within the South Orange County IRWM region to reflect removal of Newport Coast watershed RWQCB Region 8 portion from the South OC region boundary and its two ASBS designations.

Section 1.1.1 Appropriateness of Region and Geographic Boundaries: Page 1-4

Revised language to reflect change in regional boundary where only the southern portion of the Newport Coast watershed (Region 9) is included in the South OC region.

Cities and Special Districts: Page 1-8

Removed both the City of Newport Beach and City of Irvine from list of the cities, county entities and special districts that will benefit from the IRWM Plan.

Region Watersheds: Page 1-11

Newport Coast Watershed - Revised language on the discussion of the Newport Coast Watershed to reflect change in regional boundary where only the southern portion (Region 9) of the Newport Coast Watershed is included South OC region.

Section 1.1.2 Regional Ecological Processes and Environmental Resources: Page 1-13

Newport Coast Watershed – Modified discussion regarding Newport Coast Watershed to reflect change in regional boundary. Only the southern portion of the Newport Coast Watershed is incorporated in the South OC region.

Section 1.1.5 Regional Demographics: Page 1-25

Removed City of Newport Beach from Table 1.1.5-2 – South OC IRWM Group- City Populations.

Section 1.1.6 Disadvantaged Communities: Page 1-26

Updated discussion to add detail about disadvantaged communities in the South OC region.

Section 1.2 South OC Integrated Regional Water Management Group: Page 1-27.

Deleted both the City of Newport Beach and City of Irvine from regional group discussion and from Table 1.2.1.

Section 1.3.4 Process for Plan Implementation: Page 1-36

Updated language indicating that special attention “has been given” to facilitating involvement and input from minority communities and stakeholders, and addressing environmental justice remedies in the Region. Previous plan indicated that special attention “will be given.”

Chapter 3 Regional Water Management Strategies

Section 3.1 Summary of Strategies to Meet Plan Objectives: Page 3-1

Statement of consideration of unique needs of the South OC IRWM Region and relation to specific water management categories.

Section 3.3 Integration of Strategies to Meet Plan Objectives: Page 3-2

Added discussion on mechanism for how synergy created by integration of strategies can be achieved.

Section 3.4 Benefits of Integration to Meet IRWM Plan Objectives: Page 3-13

Added discussion about the importance of the IRWM Plan Objectives, relating the research and review process as the process for determining which projects should move forward in the Step 2 IRWM process.

Section 3.6 Benefits to Disadvantaged Communities / Environmental Justice: Pages 3-15, 3-16, and 3-22

Updated discussion to add detail about disadvantaged communities and project benefits to disadvantaged communities in the South OC region. Figures 8, 9 10, 11 and 12 added after page 3-16. Figures names are as followed:

- Figure 8 – Regional Map of Disadvantaged Communities
- Figure 9 – Regional Map of Disadvantaged Communities Northeast
- Figure 10 – Regional Map of Disadvantaged Communities Northwest
- Figure 11 – Regional Map of Disadvantaged Communities Southwest
- Figure 12 – Regional Map of Disadvantaged Communities South

Section 3.7 Environmental Impacts / Benefits to Other Resources: Page 3-23

Added discussion regarding the evaluation of potential negative impacts resulting from the implementation of the Plan and how they will be addressed.

Chapter 4 Implementation Priorities, Projects and Programs

Section 4.5 Project Monitoring and Performance Plan: Page 4-20

Added statement that efforts are already being implemented within the Region.

Section 4.6 Data Management: Page 4-21

- Revised language referring to the assessment of existing monitoring efforts and how they can be integrated throughout the region. (page 4-21)
- Added discussion about the system for data acquisition and sharing. (page 4-22)
- Added discussion on potential partnerships for information exchange. (page 4-23)

Chapter 5 Coordination with Existing Local/Regional Plans

Section 5.1 IRWM Projects and Linkage to Local/Regional Plans: Page 5-5

Deleted paragraph that references development of an Integrated Coastal Watershed Management (ICWM) Plan that includes the City of Newport Beach, the Irvine Company, State Parks and Caltrans since it will remain with Region 8, which reflects boundary changes.

Chapter 6 Governance

Section 6.2 Continuing Coordination with Local, Regional, and Statewide Plans: Page 6-2

Deleted paragraph which focused on current activities to develop an ICWM Plan, since the project has been fully funded.

Appendix B Water Supply, Water Quality, and Ecological Processes of Regional Watersheds

Newport Coast Watershed: Page B-1

Reflects the change in regional boundary where only the southern portion of the Newport Coast watershed is included in the South OC region boundary.

Appendix C South Orange County IRWM Group City Description

Deleted paragraph which described the City of Irvine, in order to reflect the change in Integrated Coastal Water Management Plan (ICWMP), which included Newport Beach and Region 8. Since the City of Newport Beach project was removed, the City of Irvine also does not have relationship to the projects or Plan.

Appendix I South Orange County IRWM Plan Priority A Project Detail

Appendix I has been added to the Plan to illustrate clear linkages of Priority A Projects with other projects. It also includes discussion for scientific basis where supporting data/studies are identified. Table I-1 Priority A Projects Summary has been included within Appendix I to summarize Priority A Projects. Table I-1 includes: Priority A Project Title, Economic Feasibility, Status of Implementation, Potential Negative Impacts, Data Gaps, Project Performance Evaluation and Links/Integration for Projects and Levels of Planning.

SOUTH ORANGE COUNTY
2005 INTEGRATED REGIONAL WATER MANAGEMENT PLAN
~~Total Watershed Efficiency~~

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LIST OF ACRONYMS

AB	Assembly Bill
ACP	Asbestos Concrete Pipe
AFY	Acre Feet per Year
ASBS	Areas of Special Biological Significance
ATM	Aufdenkamp Transmission Main
BOD	Biological Oxygen Demand
BMP	Best Management Practice
BST	Bacterial Source Tracking
CCA	Critical Coastal Area
CDR	Center for Demographic Research
CDS	Continuous Deflective Separation
CEDEN	California Environmental Data Exchange Network
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
CTP	Coastal Treatment Plan
CURE	Cleaning Urban Runoff Effectively
DAMP	Drainage Area Management Plan
DBP	Disinfection Byproduct
DNA	Deoxyribonucleic Acid
DRPP	Demand, Runoff, and Pollution Prevention
DWR	Department of Water Resources
EPA	Environmental Protection Agency
ET	Evapotranspiration
ETWD	El Toro Water District
FOG	Fats, Oil and Grease
GERA	Gobernadora Ecological Resource Area
GIS	Geographic Information System
HDD	Horizontal Directional Drilling
ICWM	Integrated Coastal Watershed Management
ID/IC	Illegal Discharge and Illicit Connection
IRP	Integrated Water Resources Plan
IRWD	Irvine Ranch Water District
IRWM	Integrated Regional Water Management
JRTM	Joint Regional Tri-Cities Transmission Main
LRP	Local Resources Program
MGD	Million Gallons Per Day
MNWD	Moulton Niguel Water District
MPN	Most Probable Number
MST	Microbial Source Tracking
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
NCCP	Natural Communities Conservation Plan
NCI	North Coast Interceptor
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NWRI	National Water Research Institute
OC	Orange County

OCHCA	Orange County Health Care Agency
OCSD	Orange County Sanitation District
PCC	Portland Concrete Cement
PRC	Poseidon Resources
RAP	Regional Action Project
RO	Reverse Osmosis
RTP	Regional Treatment Plant
RWQCB	Regional Water Quality Control Board
SAMP	Special Area Management Plan
SCE	Southern California Edison
SCWD	South Coast Water District
SERRA	South East Regional Reclamation Authority
SJBA	San Juan Basin Authority
SMWD	Santa Margarita Water District
SOCWA	South Orange County Wastewater Authority
SONGS	San Onofre Nuclear Generating Station
SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
SSO	Sanitary Sewer Overflow
TCWD	Trabuco Canyon Water District
TMDL	Total Maximum Daily Load
UV	Ultra Violet
UWMP	Urban Water Management Plan
WIP	Water Importation Pipeline

South Orange County
2005 Integrated Regional Water Management Plan
Total Watershed Efficiency

EXECUTIVE SUMMARY

For 200 years, south Orange County epitomized California's rancho days, with cattle on the hills and orchards in the valleys. The Mission San Juan Capistrano is a center point, flanked by a stunning coastline to the west and the Cleveland National Forest to the east.

Since the early 1960s, the region has transitioned to one of the fastest growing areas of urban development in the State. Cities, once only sleepy rural communities, have become burgeoning urban centers. And the population, which just a few years ago numbered a few thousand residents, has now exploded to more than 500,000. Homes, recreational facilities and master-planned retail areas cover the coastline. And South County's last remaining portion of undeveloped inland property, still a vivid reminder of the rancho days, is slated for development over the next 20 years.

It is because of this intensive growth and the challenges that accompany it, no segment of the Southern California region is more aware of the value of water and the need to practice a Total Watershed Efficiency approach than south Orange County. Water reliability has allowed the area to thrive; responsible water resource management will allow it to continue. This is the basic premise on which the South Orange County 2005 Integrated Regional Water Management Plan (IRWMP) was developed.

The entities that have developed the plan – 12 cities, seven water and wastewater agencies and the County of Orange, representing half a million people and working across seven major watersheds and two groundwater basins – believe that balancing the needs of the environment and the demands of a growing population is a fundamental component of Total Watershed Efficiency. To that end, south Orange County has made tremendous strides to protect and improve the San Juan and Aliso Creek watersheds, which cover nearly three-fourths of the area. Working together with the U.S. Army Corp of Engineers, the County of Orange and South County cities, water and wastewater agencies, along with concerned citizens, have taken an active role to successfully improve water quality for riparian habitat and species dependent on inland waterways. Despite these efforts, runoff quality remains degraded and beach postings and closures continue. The IRWMP will allow additional investments to reverse the degradation, and where pollution remains a problem, our plan focuses on identifying and strategically eliminating the sources.

Over the years, a considerable investment of dollars has been spent on public outreach programs in South County to educate residents on what the scientific and environmental communities have known for years...*the ocean begins at your front door*. The impact of urban runoff on our waterways cannot be underestimated. It is a mantra that is becoming ingrained in the South County culture and one that will remain prominent through the efforts included in the IRWMP.

Pristine beaches are synonymous with Southern California, and the need to curb urban runoff has hit home with tremendous force in south Orange County, where more than 2.5 million people visit Laguna Beach, Dana Point and San Clemente - and all points in between - on an annual basis. Tourism and the hospitality industry are central to the south Orange County economy, and a day at a clean beach provides a welcome respite for both residents and visitors alike. Beach postings and closures are an unwelcome intrusion, and our plan focuses on investments to ensure beachgoers can continue to enjoy these world-famous facilities.

South Orange County - indeed, all of Orange County - is located in a semi-arid region where an average of 13 inches of rain falls each year. Responsible water resource management also includes water use efficiency, respecting available supplies and using them wisely. And in a growing area, like south Orange County, which is dependent on imported water to meet 94 percent of its potable needs, there is also a need to investigate new water sources, including ocean water desalination, groundwater recovery and additional surface water storage capacity to improve system reliability. Our plan includes these strategies.

The South Orange County 2005 Integrated Regional Water Management Plan also includes extensive investments for water conservation efforts, including state-of-the-art weather-based irrigation controllers. These computer-controlled devices are designed to reduce wasteful over-watering and are key components of our comprehensive watershed approach. Not only will weather-based irrigation controllers save water for other important uses, they will also help protect the watershed by curbing urban runoff and the transport of pollutants to our beaches.

As the South Orange County Water Reliability Study, recently completed by the Municipal Water District of Orange County and South County water retailers, clearly emphasizes effective planning plus appropriate investments will ensure ongoing reliability. And nowhere is improving water reliability more critical than in South Orange County, which is dependent on one treatment facility and two regional pipelines for its water supply.

Significant investments in water and sewer infrastructure have been made in the past to allow the area to be served on a reliable basis. Diligent planning and appropriate investments will carry the region through the next 25-year planning horizon.

Overall, the objectives, strategies and investments outlined on the following pages emphasize our dedication to implementing an Integrated Regional Water Management Plan that embraces Total Watershed Efficiency and ensures the continued economic vitality and quality of life that are synonymous with south Orange County.

Region Description

The South Orange County IRWM Plan includes the region that encompasses the San Juan Hydrologic Unit in South Orange County, California, as defined by the State Regional Water Quality Control Board, Region 9 Basin Plan. The Region includes the Newport Coast Watershed in the north; however, most of the Newport Coast Watershed, which covers about 11 square miles, falls within RWQCB-Region 8 with a small southern portion falling within

the jurisdiction of Region 9. Therefore, only the Region 9 portion is included in the South OC region. The watersheds, include the Newport Coast (southern, region 9 portion), Laguna Coastal Streams, Aliso Creek, Dana Point Coastal Streams, San Juan Creek, San Clemente Coastal Streams, and San Mateo Creek. The watersheds are shown in Figure ES-1. The basins include the San Juan Groundwater Basin and a small portion of the San Mateo Groundwater Basin.¹

Integrated Regional Water Management Group

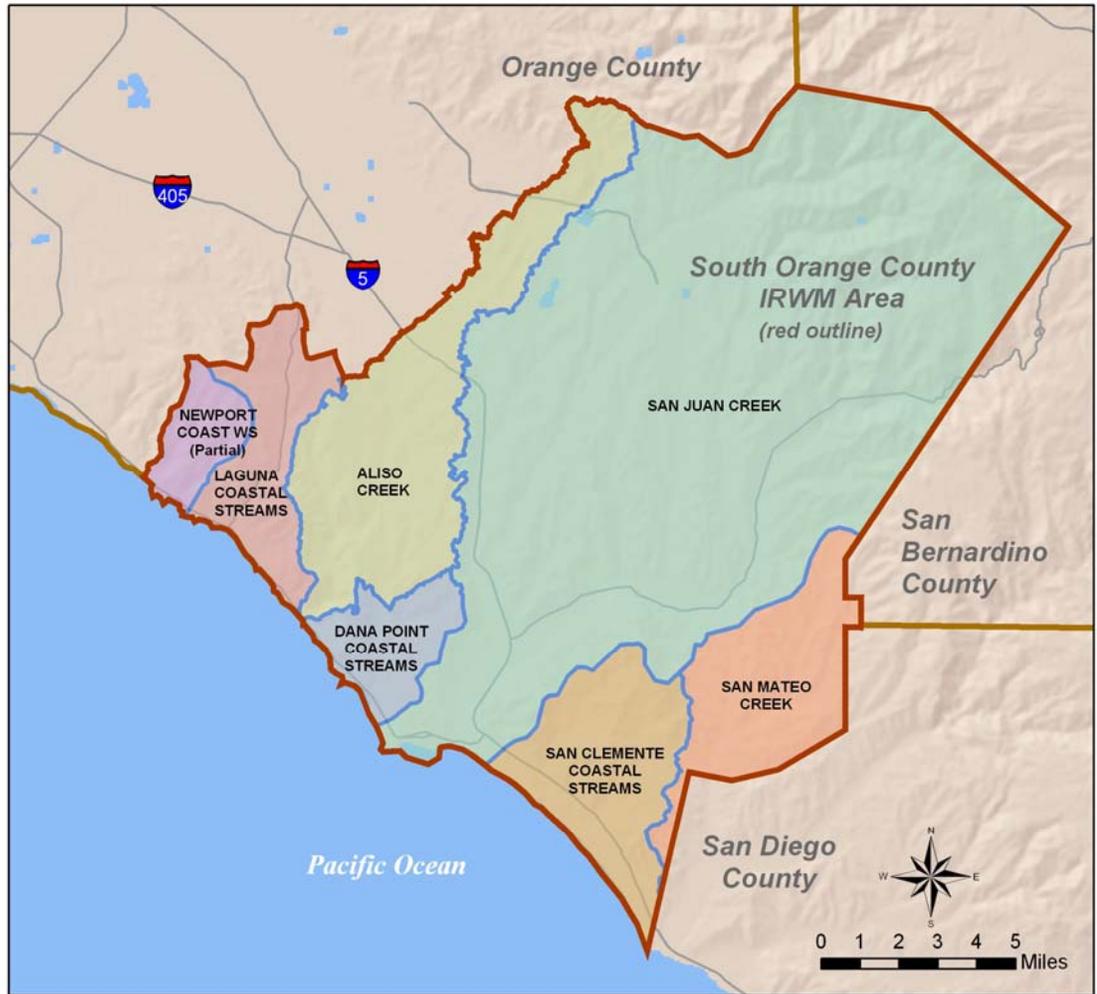
South Orange County cities, County, water, watershed, park, and wastewater agencies (South Orange County IRWM Group) support the need for an Integrated Regional Water Management (IRWM) model. The South Orange County IRWM Group maintain the belief that an integration of water management strategies working together best provides a reliable water supply, protects and improves water quality, and achieves other multiple objectives in an efficient manner.

The South Orange County IRWM Group that formed to develop an IRWM Plan is comprised of the County of Orange and the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. In addition to the cities, special districts and agencies participating in the development of the South Orange County IRWM Plan include the following:

- California Department of Water Resources
- California State Parks
- El Toro Water District
- Irvine Ranch Water District
- Laguna Beach County Water District
- Moulton Niguel Water District
- Municipal Water District of Orange County
- Natural Resources Conservation Service
- Orange County Flood Control District
- Orange County Health Care Agency
- Regional Water Quality Control Board – Region 9
- San Juan Basin Authority
- Santa Margarita Water District
- South Coast Water District
- South Orange County Wastewater Authority
- State Water Resources Control Board
- Trabuco Canyon Water District

These entities serve as the beneficiaries of the IRWM Plan and its implementation of various projects.

¹ County of Orange. Orange County Stormwater Program 2003 Drainage Area Management Plan (DAMP). Appendix D Watershed Chapters. 12/20/04. Online:
http://www.ocwatersheds.com/StormWater/documents_damp_chapters.asp



IRWM Region Watersheds
Figure ES-1

Water Demands and Supplies

South Orange County relies predominantly on imported water to the region to meet its water demand. As much as 94 percent of the potable water supplied in the region is imported water. The South Orange County IRWM Group recognized the high priority of water reliability to the region and has included multiple IRWM Plan objectives that are aimed at continuing to reduce water supply vulnerability. Additionally, objectives focus on water quality to reduce and prevent pollution, while protecting the beneficial uses of the waters in the region, as well as guarding and restoring the biological diversity and ecosystems of the region's watersheds.

Coordination with Local/Regional Planning Documents

This Plan has been developed from and coordinates with existing plans and research documents provided by the participating agencies in a manner that identifies and integrates regional projects to improve water supply and quality. This Plan establishes a priority ranking to help further regional efforts to investigate the feasibility of, and identify funding for, these projects. Individual projects however, will go through the appropriate environmental review and permitting process during the funding process.

IRWM Plan Objectives

The purpose of the IRWM Group and its meetings in developing this Plan is to identify potential projects intended to improve water quality and supply in order to investigate their feasibility, engage in long range water planning, to establish priorities among the proposals of the member entities and obtain potential funding. If the Plan is implemented, the County of Orange, as agent of the State of California, will serve as a conduit for funding to the individual agencies proposing the projects. This Plan does not commit any resources to implementation of any project nor does its creation constitute a commitment by the County of Orange or any member entity to carry out any of the proposed projects. Determinations to proceed with individual projects and required environmental review under the California Environmental Quality Act, will be performed by the individual agencies prior to approval of funding.

The IRWM Plan focuses primarily on the projects and plans of the member agencies, with an emphasis on water supply and water quality. The principal challenges facing South Orange County are reflected in each of the individual member agencies, with a focus on the following:

- Water Reliability
- Seasonal Storage
- Water Quality
- Water Recycling
- Watershed Management
- Environmental Protection
- Grant/Agency Funding

Identifying the long-term water supply and water quality issues facing the South Orange County region over the next 20 to 50 years enables the South Orange County municipalities and agencies to more effectively plan for the projects necessary to meet these challenges. All

project categories within this plan are essential to maximizing limited water resources, protecting water quality, and enhancing the environment. This integrated approach allows local agencies to access a wealth of regional resources, diversifying water supply sources over a broad range of projects.

In order to address the major water challenges within the region, key objectives were compiled in the following categories:

1. Water Supply (WS)
2. Groundwater Management (GM)
3. Aquatic Ecosystems and Watershed Management (AE)
4. Water Conservation (WC)
5. Water Quality Pollution Reduction (WQ)
6. Sewage and Flood Management (SF)
7. Information Management (IF)

Objective WS-1: Diversify the mix of water supplies to meet South Orange County's needs, through water use efficiency efforts, developing local sources such as recycled water, groundwater and ocean water. Expand local water sources including conservation from the current 19% of total supplies to 30% of supplies by 2030.

Objective WS-2: Improve South Orange County system reliability to provide sufficient water supplies during both planned and unplanned emergency outages of the import water system. Develop storage, local resources and interconnections with other agencies or regions of Orange County to meet demands without the benefit of the imported water system for a minimum of 7 days at average demands by 2010 and increasing to 20 days at peak summer demands by 2020.

Objective WS-3: Reduce the vulnerability of water supply systems to droughts.

Objective WS-4: Ensure that appropriate levels of investments are made to meet water supply, water system and water quality objectives.

Objective GM-1: Balance groundwater pumping with increased recharge capabilities to fully utilize the storage capability of the groundwater basins in South Orange County.

Objective GM-2: Protect groundwater from contamination; through 2030, increase the recharge capability and pumping capability of the San Juan Basin by about 7,500 AF, beyond the current 2005 dependable yield capacity of 7,300 AF.

Objective WC-1: Reduce water demand by 9,700 AF in 2005 increasing to more than 19,600 AF in 2030 through the implementation of Best Management Practices water use efficiency measures.

Objective AE-1: Optimize the healthy functioning of regional aquatic ecosystems.

Objective AE-2: Manage developed areas to minimize impacts on downstream aquatic ecosystems.

- Objective WQ-1:** Protect the quality of surface and groundwaters, consistent with their beneficial uses.
- Objective SF-1:** Optimize capacity and reliability of sanitary and stormwater management systems.
- Objective SF-2:** Optimize handling of sanitary and stormwater wastes to minimize environmental and socioeconomic impacts.
- Objective IF-1:** Develop and maintain technical data management, research and analysis systems as appropriate to support the goals of the IRWM Plan.
- Objective IF-2:** Develop and implement public education programs and opportunities as appropriate to support the goals of the IRWM Plan.

Where appropriate at the conceptual level of detail, objectives are described quantitatively. For some objectives, quantifiable goals are more appropriately developed at the detailed strategic and/or project levels, more specifically described in Chapters 2, 3 and 4. Each set of objectives includes a discussion of management measures being implemented or planned to meet the respective objectives.

These objectives have led the South Orange County IRWM Group into developing specific regional water management strategies. Implementation of strategies through the integrated and balanced projects as proposed will:

- » Provide multiple benefits
- » Improve water supply reliability
- » Attain and maintain long term water quality standards
- » Protect and enhance groundwater resources
- » Reduce/eliminate pollution in impaired water bodies and sensitive habitat areas
- » Serve disadvantaged communities

Strategies to Meet Plan Objectives

Implementation strategies for each Plan objective are summarized below. Where appropriate, strategic targets for 2030 are quantified.

Objective WS-1

- **Strategy WS-1A:** Continue to work with MWDOC and Metropolitan to ensure that reliability of imported supplies is maintained throughout the planning horizon. Decrease the Region's need for imported supply over the planning period to 2030.
- **Strategy WS-1B:** Develop 15,000 AF of supplies potable supplies or possibly more through desalination of ocean sources by 2030. Research is currently underway at the Dana Point and Camp Pendleton sites. The earliest expected on-line date is 2012.
- **Strategy WS-1C:** Increase production and distribution capacity for expanding the use of recycled water to 20,000 AF by 2030.

- **Strategy WS-1D:** Increase pumping and needed treatment of local groundwater for water supply, consistent with sustainability and conjunctive use with other supplies, for potable uses to 10,000 AF.
- **Strategy WS-1F:** Eliminate or reduce non-native urban runoff by capturing, treating and utilizing dry-weather urban runoff and stormwater, primarily for non-potable uses, additionally benefiting riparian eco-systems. Known project yields have been included within the recycling numbers.
- **Strategy WS-1G:** Investigate emerging technology and regulatory actions for decentralized on-site capture, storage and re-use of rainwater for irrigation purposes, consistent with water quality and vector control needs.

Objective WS-2

- **Strategy WS-2A:** Specific projects to improve the system reliability include:
 - Orange County Cross Feeder
 - Coastal Junction Pump Station
 - IRWD Interconnections
 - Groundwater Emergency Service Program
 - Construction of Upper and Lower Chiquita lined and covered reservoirs
 - Construction of an ocean desalination facility
 - Demand curtailment during an emergency by asking for help from the public

Objective WS-3

- **Strategy WS-3A:** Development of local supplies including recycling supplies, ocean desalination and water use efficiency improvements will help reduce the risk of drought exposure to the South Orange County Region.
- **Strategy WS-3B:** Pursue the use of water transfers from outside the Region to improve water supply reliability.
- **Strategy WS-3C:** Work with MWDOC and Metropolitan to ensure that imported supplies and the regional system of facilities remain highly reliable.

Objective GM-1

- **Strategy GM-1A:** Increase recharge of managed groundwater aquifers in a cost-effective manner consistent with minimizing socioeconomic and environmental impacts.
- **Strategy GM-1B:** Increase pumping at underutilized groundwater aquifers where cost-effective and sustainable.

Objective GM-2

- **Strategy GM-2A:** Prevent saltwater intrusion into freshwater aquifers as pumping increases.
- **Strategy GM-2B:** Prevent contamination of aquifers by sewage, industrial or other wastes.

Objective AE-1

- **Strategy AE-1A:** Eradicate *Arundo donax*, the most highly invasive exotic plant species within regional aquatic ecosystems, 100% by 2030 for the entire aquatic ecosystem areas within the Region affected in 2005.
- **Strategy AE-1B:** Eradicate other highly invasive plant species, including but not limited to Pampas Grass (*Cortaderia selloana*), and Tamarisk (*Tamarix spp*) from regional aquatic ecosystems and adjacent transitional habitats.
- **Strategy AE-1C:** Stabilize streambeds impacted by development-exacerbated stormflows, consistent with maintaining natural soft-bottom channels rather than hardened channels to the extent feasible.
- **Strategy AE-1D:** Convert hardened ditches and channels to widened soft-bottomed naturally-vegetated channels where feasible, consistent with the needs of erosion and flood control.
- **Strategy AE-1E:** Re-establish native aquatic, riparian and transitional biotic communities along streamcourses to the extent feasible.
- **Strategy AE-1F:** Eliminate anthropogenic impacts to marine Areas of Special Biological Significance to the extent feasible.
- **Strategy AE-1G:** Design new infrastructure and/or retrofit existing infrastructure along streamcourses to minimize exacerbation of hydraulic impacts of stormflow on the streamcourse.
- **Strategy AE-1H:** Construct artificial wetlands where feasible and appropriate to buffer the impacts of development on natural aquatic ecosystems.

Objective AE-2

- **Strategy AE-2A:** Promote the judicial incorporation or retrofitting of stormflow attenuation processes, devices and/or permeable surfacings into new and existing developments that disrupt natural hydrologic patterns.
- **Strategy AE-2B:** Promote the utilization of non-structural BMPs, appropriate to land use type, to eliminate nuisance runoff and prevent potential pollutants from entering municipal storm drain systems and aquatic ecosystems, during both wet and dry weather.
- **Strategy AE-2C:** Promote the utilization of structural Best Management Practices (BMPs), appropriate to land use type, to eliminate nuisance runoff and reduce the discharge of pollutants from municipal storm drain systems into downstream aquatic ecosystems, during both wet and dry weather.
- **Strategy AE-2D:** Provide opportunities for controlled recreational access and enjoyment of aquatic ecosystem areas to minimize the environmental impacts of uncontrolled use.

Objective WC

- **Strategy WC-1A:** Promote the use and/or retrofitting of Weather Based Irrigation Timers in new and existing single-family homes and commercial landscapes to reach 2030 target of 6,700 acre-feet reduction in water usage regionally.
- **Strategy WC-1B:** Promote the use and/or retrofitting of irrigation system distribution uniformity improvements in new and existing developments.
- **Strategy WC-1C:** Promote the use and/or retrofitting of more water-efficient plumbing fixtures, equipment and processes in industrial and commercial businesses to reach 2030 target of 4,450 acre-feet reduction in water usage regionally.
- **Strategy WC-1D:** Promote the use of native or non-native drought-tolerant low-water-use plants in new developments and for retrofitting existing high-water use landscaping.
- **Strategy WC-1E:** Promote the use of alternative landscape design features including permeable inert surfacing materials in lieu of high-water-use landscape ground covering plants in new developments and for retrofitting existing landscaping.

Objective WQ-1

- **Strategy WQ-1A:** Promote the region-wide utilization of non-structural BMPs to prevent potential pollutants from entering municipal storm drain systems and aquatic ecosystems, during both wet and dry weather.
- **Strategy WQ-1B:** Promote the region-wide utilization of centralized and decentralized structural BMPs to minimize the discharge of pollutants into or from municipal storm drain systems and into downstream aquatic ecosystems, during both wet and dry weather.
- **Strategy WQ-1C:** Install trash screens or gates at drainage inlets to keep trash out of storm drain pipes during dry weather, at suitable locations. 2030 Strategic Target is 75% coverage of suitable sites.
- **Strategy WQ-1D:** Install trash collecting devices within storm drain systems and/or tributary channels to capture trash during low-flow and moderate-to-high flow storms, where feasible. 2030 Strategic Target is 100% coverage of suitable sites.
- **Strategy WQ-1E:** Promote grease control measures at restaurants and other grease-producing sites to reduce sanitary sewer overflows and spills caused by grease blockages. 2030 Strategic Target is 100% coverage of susceptible sites.
- **Strategy WQ-1F:** Promote manure control measures from livestock areas to reduce contamination to downstream aquatic ecosystems. 2030 Strategic Target is 100% coverage of susceptible sites.
- **Strategy WQ-1G:** Promote the development, installation, application or updating of pathogen control data, methods of measurement and management to protect high-use beaches.
- **Strategy WQ-1H:** Promote the installation, application or updating of toxics control measures to protect downstream aquatic ecosystems.

- **Strategy WQ-1I:** Promote the installation, application or updating of biostimulatory nutrients control measures to protect downstream aquatic ecosystems.
- **Strategy WQ-1J:** Promote the installation, application or updating of erosion and sediment control measures to protect downstream aquatic ecosystems.
- **Strategy WQ-1K:** Cap abandoned wells to protect groundwater aquifers from contamination by direct inputs from the surface. 2030 Strategic Target is 100% coverage of known susceptible sites.
- **Strategy WQ-1L:** Promote the installation and application of nuisance water diversions when determined to be an effective solution to impairments downstream.
- **Strategy WQ-1M:** Promote the implementation of educational programming focused on water quality.

Objective SF-1

- **Strategy SF-1A:** Keep sanitary sewer and stormwater collection systems in good repair.

Objective SF-2

- **Strategy SF-2A:** Promote sewage biosolids composting and re-use for soil fertilization/conditioning, where appropriate. 2030 Strategic Target is 90% re-use of regionally-generated biosolids.
- **Strategy SF-2B:** Promote recovery and recycling of solid waste materials collected from streets and stormwater handling systems. 2030 Strategic Target is 75% recovery and recycling of regionally-generated solid wastes.

Objective IF-1

- **Strategy IF-1A:** Promote the use of Geographic Information Systems, data bases and other data management tools in support of IRWM Plan goals.
- **Strategy IF-1B:** Promote scientific research, technological development, and investigative studies as needed to support IRWM Plan goals.

Objective IF-2

- **Strategy IF-2A:** Promote public education programs and opportunities as appropriate to support the goals of the IRWM Plan.
- **Strategy IF-2B:** Promote professional, worker and student educational opportunities as appropriate to support the goals of the IRWM Plan.
- **Strategy IF-2C:** Promote informational programs for elected officials and regulatory personnel as appropriate to support the goals of the IRWM Plan.

Per-project performance would be measured specifically for each IRWM Plan strategy. Quantitative and qualitative performance measurements will include total number, acreage, percentages, linear feet, volumes, reduction quantities – volumes, rates, weight, percentages, concentrations; and expansion of data sets and information

Integration of Water Management Strategies to Meet Plan Objectives

South Orange County considered numerous water management strategies and has identified a range of such strategies that will meet the regional objectives. The mix of proposed water management strategies provides a balance of water planning for South Orange County. The proposed strategies are incorporated within the IRWM projects, and will collectively enhance water reliability, water quality, and local water supply. It is with great consequence that South Orange County continues to integrate regional solutions to water supply and water quality challenges.

Projects identified within this plan represent the range of strategies, which include an integration of the following:

- Ecosystem restoration
- Environmental and habitat protection and improvement
- Flood management
- Groundwater management
- Imported water
- Land use planning
- NPS pollution control
- Ocean and brackish water desalination
- Recreation and public access
- Storm water capture and management
- Surface storage
- Water and wastewater treatment
- Water conservation
- Water quality protection and improvement
- Water recycling
- Water supply reliability
- Water transfers
- Watershed planning
- Wetlands enhancement and creation

Implementation Priorities, Projects and Programs

Project Categories to Link Integration of Water Management Strategies

1. **Water Supply:** Includes development of new potable and non-potable sources, providing nearly 18,000 AF of new water by 2030 and new conservation over and above 2005 levels of about 10,000 AF of supplies. The IRWM Plan encourages recycled water use as a means to reduce the Region's overall consumption of potable sources, as well as development of numerous other sources such as urban runoff reuse, new groundwater sources and even ocean desalination. Development of these additional local resources enhances the Region's water supply and water system reliability. It must be noted that even with extensive development of local supplies,

including ocean desalination, the South Orange County area will remain highly dependent on imported supplies over time. A plan for investments necessary to protect system reliability improvements out into the future in the event there is a short term 10 to 30 day outage of the import system is well underway.

2. **Water Conservation:** Water demands will be significantly reduced through conservation, estimating about 19,600 AF in water savings by 2030 (includes about 10,000 AF over and above conservation levels in 2005; more aggressive conservation could result in even more savings). More efficient irrigation practices carries with it the multiple benefits of more efficient utilization of resources, reduction in runoff, and less transport of sediment and pollutants through waterways and into the ocean environment.
3. **Aquatic Ecosystems and Watershed Management:** Provides a variety of projects, including wetlands construction, non-native plant removal, and stream restoration, to restore the Region's watershed environment. Ultra violet and other types of treatment will be implemented to improve the water quality of runoff.
4. **Water Quality / Pollution Reduction:** Will provide Regional Action Projects that are supported and implemented by multiple cities and the County for urban runoff pollution treatment, in addition to water quality benefits to areas of special biological significance and protection of critical coastal areas.
5. **Sewer and Flood Management:** Provides projects that result in improved sewer system reliability and reduced sewer spills, improved levee system in San Juan Creek, flood protection, improved riparian habitat, erosion control, improved maintenance, and water quality benefits.
6. **Education and Information Management:** Education and information management is the cornerstone of promoting support and stewardship of projects and programs. Principles of environmental stewardship, landscaping and maintenance practices, sustainable building, energy efficiency are all integrated into the objective of education projects and programs in South Orange County. The proposed Orange Coast Watershed Center will offer practical public education in the stewardship of watershed, energy and material resources. The multiple agency, institutional and non-governmental partners have developed a range of educational curriculum through recreational opportunities, training programs, educational classes, and inspirational settings.

Additionally, coordinated projects for the development of specific data for use in land use planning is significant to the success within the Region. A spatial database containing hydrogeologic information, land use and property ownership, aerial photography, and water quality data, will result in a Geographic Information System to be utilized as a watershed planning and analysis tool, as well as information that can be integrated into local land use plans.

7. **Other:** Projects that have specific benefits to the Region and incorporate one or more of the water management strategies, although do not meet the criteria established for the seven foundational project categories, are included in this category. Several projects currently proposed will result in the following: 1) reduced bacterial pollution

in the watersheds through the composting and use of organic materials; and 2) enhanced reliability through water/wastewater facility security improvements.

While the listed categories are clearly distinct with unique objectives, they are also integrated and each builds on the success of the others. Maximum benefits will be derived from the application of these program areas to meet the objectives of the IRWM Plan.

Tables ES-1 and ES-2 present the IRWM Plan projects, High-ranking Priority A and Priority B respectively. The projects are identified by the following categories: Priority, Water Management Strategy (category), Implementing Agency, Project Title and Description, Cost, Yield, and Project Time Horizons.

Timeline for Implementation

Priority A projects include a timeline for implementation through the year 2010. Priority B Projects include those through the year 2030. The Priority A projects are of highest priority and certain to be implemented, and are determined to be essential for the long-term goals and objectives of the Region. Appendix I has been added to the Plan to clearly illustrate the Priority A projects that are moving forward in the planning process in preparation for complete implementation. Table I-1 has been included in Appendix I to summarize details about the specific Priority A projects.

Since the economy, funding availability, political climate, and other factors are ever-changing, it is important to recognize that the project timelines are considered flexible. Priority A Projects may be accelerated if needed and Priority B Projects may be constructed well in advance of their original timeline. As these situations are identified, the IRWM Plan will be refined and amended periodically, although no less than every five years.

Regional Plan Advantages

Implementation of the IRWM Plan and its proposed projects will allow the Region to continue to move into a future with an increasingly reliable water supply, protected and improved water quality, and achievement of the statewide priorities and program preferences for integrated regional water planning. The development of the Plan has served as an impetus to bring stakeholders together to discuss common goals, address concerns, and brainstorm solutions. This has provided an effective tool for addressing inclusive watershed management.

The IRWM Plan includes objectives, strategies and projects that address Statewide priorities as established by the State Water Resources Control Board (SWRCB) and the Department of Water Resources (DWR), including:

- Implementation of Total Maximum Daily Loads that are established or under development;
- Implementation of Regional Water Quality Control Board Watershed Management Initiative Chapters, plans, and policies;

- Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan;
- Assist in meeting Delta Water Quality Objectives;
- Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan;
- Address environmental justice concerns; and
- Assist in achieving one or more goals of the CALFED Bay-Delta Program.

The IRWM Plan objectives, strategies and projects will also address the IRWM Program Preferences as established by the California Water Code and implementing legislation, including:

- Integrated projects with multiple benefits;
- Support and improve local and regional water supply reliability;
- Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards;
- Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance;
- Safe drinking water and water quality projects that serve disadvantaged communities; and
- Groundwater management and recharge projects.

The IRWM Plan will establish an Integrated Regional Water Management Model that could be used as a template for other areas of the State.

Governance

The County of Orange will serve as the IRWM Plan administrator. Plan implementation will be in coordination with IRWM Group members and in accordance with the proposed project schedule of each project proponent. The County will be accountable to the IRWM Group for coordination and management as well as outside funding sources that require regional applications and agreements.

The County of Orange will lead quarterly IRWM Plan meetings with the IRWM Group. The quarterly meetings will focus on status of plan and project implementation, project funding, monitoring, data management and reporting, and review of priorities and necessary refinements.

The Governance/Management Committee of the IRWM Group is composed of County, city, and water/special district representatives. They will continue to meet for the purposes of discussing IRWM Plan implementation and refinement issues, and to provide recommendations to the IRWM Group. Activities of the Governance/Management Committee will facilitate focused and streamlined IRWM Group meetings.

The Executive Committee of the IRWM Plan will be composed of elected representatives from participating agencies. They will meet on a semi-annual basis to oversee policy issues and budget decisions.

The County will lead an update of the IRWM Plan no less than every five years. This will be accomplished in the IRWM Group environment affording the opportunity for input from all stakeholders. A public information meeting(s) will be held to ensure participation and input by the public and private stakeholders.

This two-layer method of administration will promote partnership opportunities between cities and special districts. It will also facilitate ongoing and meaningful public and private stakeholder involvement and group participation and decision making.

Table ES-1 2005 IRWM Plan Priority A Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
1a	Water Conservation	MWDOC	Water Efficiency Program Expansion - Phase I	Phase I: Expand rebate program for weather-based irrigation technology (ET Controllers).	\$2,020,000	1,000	10/1/06	3/1/09	1/1/06	6/1/09	
1b	Water Conservation	REGIONAL ACTION PROJECT	GreenBack Program - Phase I	Administered by MWDOC, includes region cities: Landscape renewal rebate program aimed at encouraging structural conversion of existing landscapes.	\$876,000	50	12/1/07	3/1/09	12/1/07	3/1/09	CEQA/NEPA Complete
2	Water Supply	Santa Margarita Water District	Gobernadora Multipurpose Basin	Construction of storm detention basin that will be established as a wetland/riparian habitat to treat urban runoff and storm flows.	\$10,050,000	725	7/1/06	7/1/07	7/1/07	continuous monitoring	CEQA/NEPA 1/2004-6/2006
3	Water Quality / Pollution Reduction	Laguna Beach	Heisler Park Marine Habitat Protection	Construction of multi-beneficial water quality improvements to protect the adjacent Heisler ASBS.	\$1,616,000		12/1/06	5/1/07	5/1/07	12/1/07	CEQA/NEPA 6/1/04-6/1/05
4	Water Supply	ETWD, IRWD, & MNWD	Joint Recycled Water Treatment and Distribution	Water Recycling Facility and Distribution	\$13,790,900	3,000	5/1/07	7/1/08	6/1/08	ongoing	CEQA/NEPA 2/1/05-6/1/06
5a	Water Supply	SOCWA	J.B. Latham Treatment Plant - Advanced Water Treatment Project	Final design and construction of 11 MGD advanced water treatment facility at J.B. Latham Treatment Plant	\$15,654,760	5,000	7/1/06	7/1/07	7/1/07	continuous monitoring	CEQA/NEPA 07/01/05-6/1/06
5b	Water Supply	San Juan Capistrano	Recycled Water Transmission System Improvements	The San Juan Capistrano Recycled Water Transmission System Improvements Project will construct transmission mains and a recycled water reservoir as the next phase of improvements to the recycled water system.	\$20,843,000	4,000	10/1/06	1/1/08	1/1/08	1/1/09	Posted Negative Declaration 6/25/01, State Clearing House 8/2001
6	Water Supply	San Clemente	Recycled Water Treatment and Distribution	Expansion of the City's reclamation treatment and distribution systems.	\$14,112,000	2,900	10/1/07	12/1/08	12/1/08	ongoing	10/1/05 - 6/1/06; Possible Categorical Exemption or Negative Declaration
7	Water Quality / Habitat Restoration	Aliso Viejo	Wood Canyon Emergent Wetland Project	Construction of emergent wetland to enhance habitat, support functions/values, improve water quality, and mitigate channel incision, degradation, and flooding.	\$204,000		10/1/06	11/1/06	11/1/06	11/1/09	CEQA/NEPA: Completed
8	Water Quality / Habitat Restoration	County of Orange/ SOCWA/MNWD	Aliso Creek Mainstem Ecosystem Restoration and ACES	Stream restoration, stabilization, and replacement/relocation of utility lines in the Aliso Creek from upstream of the SOCWA bridge to Pacific Park Dr.	\$15,010,000		7/1/07	7/1/09	7/1/09	7/1/10	CEQA/NEPA 12/1/05-6/1/06
9	Water Supply	SCWD	Water Harvesting on Aliso Creek	Utilizes Mobile Urban Runoff Filtration technology to intercept and treat contaminated urban runoff and produce a high purity recycled water product	\$627,000		8/1/2006	10/1/2006	11/1/2006	11/1/2007	CEQA/NEPA 12/1/05-3/1/06
10	Water Conservation	REGIONAL ACTION PROJECT	DRPP - Demand Runoff & Pollution Prevention	Encourages structural conversion of existing landscape features that have a high impact on urban runoff quantity/quality and water demand		400					
10				SAN JUAN CAPISTRANO: Marco Forester Middle School Soccer Fields	\$1,124,510		3/1/06	10/1/06	n/a	n/a	CEQA/NEPA 11/1/04-2/1/05
10				LAGUNA NIGUEL: Synthetic Grass at Bear Brand Park Soccer Field	\$1,124,510		7/6/05	9/1/06	10/1/06	3/1/07	CEQA/NEPA 1/2006 - 4/2006
10				LAGUNA NIGUEL: Crown Valley Parkway Median Improvements	\$505,891		7/7/07	7/1/08	3/1/08	6/1/08	CEQA/NEPA 3/7/06-6/30/06
10				MISSION VIEJO: Marguerite Parkway Median & Slope Improvements	\$1,475,944		7/6/05	7/1/08	7/1/08	7/1/09	Based upon \$7/sq. ft. conversion costs.
10				MISSION VIEJO: Trabuco Road Median Improvements	\$573,712		7/6/05	7/1/08	7/1/08	7/1/09	Based upon \$7/sq. ft. conversion costs.
10				LAGUNA WOODS: El Toro Median Landscaping Update, Moulton to Paseo de Valencia	\$177,616		7/1/06	11/1/06	11/1/06	3/1/07	CEQA/NEPA Complete
10				LAGUNA WOODS: El Toro Median Landscaping update, Calle Sonora to Moulton	\$83,840		11/1/06	3/1/07	3/1/07	7/1/07	CEQA/NEPA 7/1/05 - 8/1/05

Table ES-1 2005 IRWM Plan Priority A Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
10				LAGUNA WOODS: Moulton Parkway Median Landscaping Improvements, Santa Maria to Southern City Limit	\$1,294,990		6/1/07	7/1/08	7/1/08	12/1/08	CEQA/NEPA 7/1/05 - 11/1/05
10				LAGUNA HILLS: Oso Parkway Median Landscaping Improvements	\$1,071,483		3/1/07	9/1/07	9/1/07	1/1/08	Based upon \$7/sq. ft. conversion costs.
10				LAGUNA HILLS: Moulton Parkway Median Landscaping Improvements	\$647,639		3/1/07	9/1/08	9/1/08	12/1/08	Based upon \$7/sq. ft. conversion costs.
11	Water Quality / Pollution Reduction	REGIONAL ACTION PROJECT	CURE - Cleaning Urban Runoff Efficiently	Cleaning Urban Runoff Effectively: Pollution Treatment and Trash & Debris Controls for Impaired Waterbodies							
11				ALISO VIEJO: Dairy Fork Trash Removal & Wetland Treatment	\$262,750		8/1/07	11/1/07	11/1/07	11/1/11	CEQA/NEPA 7/1/06-7/1/07
11				RANCHO SANTA MARGARITA: Treatment Vaults in 2 Locations	\$332,100		3/1/07	6/1/07	n/a	n/a	CEQA/NEPA Complete by 7/1/06
11			<i>current action due to ASBS status</i>	LAGUNA BEACH: Urban runoff diversion and storm water filter systems at 5 beach priority storm drain outlet locations at Bluebird, Laguna Ave., Gaviota, Mountain Ave., and West St.	\$961,400		4/1/07	5/1/07	6/1/07	12/1/07	CEQA/NEPA complete
11				MISSION VIEJO: Installation of Treatment Vault at end of 81-inch pipe, J01P03	\$181,510		7/1/06	7/1/07	7/1/07	9/1/07	CEQA/NEPA 1/2005-2/2006
11				SAN JUAN CAPISTRANO: Update grease control BMPs at grandfathered restaurants	\$301,200		7/1/06	9/1/07	n/a	n/a	CEQA/NEPA N/A
11				SAN JUAN CAPISTRANO: Retrofit streamside horse stables with surface & subsurface BMPs	\$935,080		10/1/06	10/1/08	n/a	n/a	
11				COUNTY AND CITIES: Installation of Catch Basin Debris Screens (-900)	\$1,139,500		7/1/06	7/1/09	7/1/08	10.1.09	
11				DANA POINT: 150 Catch Basin Filter Upgrades	\$45,500		7/1/06	7/1/08	7/1/08	7/1/09	Project costs based upon \$300 per filter.
11				LAGUNA BEACH: Catch Basin Filter Retrofits at 20 Locations	\$40,500		4/1/07	5/1/07	6/1/07	12/1/07	CEQA/NEPA complete
11				LAKE FOREST: Installation of 400 Catch Basin Filters	\$116,150		3/1/07	6/1/07	6/1/07	6/1/08	CEQA/NEPA 1/2006-6/2006 Project costs based upon \$300 per filter.
12	Water Quality / Habitat Restoration	County of Orange / IRWM Region	Arrundo Removal	Non-native Arrundo donax removal along creeks	\$13,450,000		6/1/06	5/31/10	6/1/08	5/31/10	CEQA/NEPA 9/1/05-3/1/06
13	Water Quality / Pollution Reduction	Dana Point	DOHENY BEACH SOURCE INVESTIGATION & TREATMENT/IMPLEMENTATION STUDY (includes DP as lead, SJC, LN, LH, MV, RSM, OCFCD)	Conduct concurrent microbial source tracking and epidemiology analyses and assessment in the San Juan Creek Watershed.	\$2,500,000		7/1/06	9/1/07	9/1/07	9/1/08	
14a	Water Conservation	MWDOC	Water Use Efficiency Expansion - Phase II	Phase II - Expand rebate program for weather-based irrigation technology (ET Controllers)	\$6,936,551	4,000	9/3/10	9/3/10	9/2/11	6/1/12	
14b	Water Conservation	REGIONAL ACTION PROJECT	GreenBack Program - Phase II	Administered by MWDOC, includes region cities: Landscape renewal rebate program aimed at encouraging structural conversion of existing landscapes.	\$2,114,000	110	7/3/09	9/1/10	9/3/10	9/2/11	

Table ES-1 2005 IRWM Plan Priority A Projects - By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
15	Water Quality / Habitat Restoration	NGOs	Habitat Restoration Projects	Laguna Creek Restoration Project and other stream course habitat restoration projects selected through the Wetlands Recovery Project South Orange County Small Grants Workplan process.	\$51,000		7/1/06	1/1/09	6/1/06	1/1/10	CEQA/NEPA 1/1/06-1/1/08
16	Water Conservation	TCWD	Water Filter Backwash Water Recovery	Recover waste filter backwash that is currently wasted to the sewer; water would be treated and mixed back into the raw influent.	\$595,000	180	2/1/07	3/1/07	3/1/07	4/1/07	CEQA/NEPA 7/1/06-6/1/06
17	Water Supply	Santa Margarita Water District	South Orange County Emergency Storage Reservoirs Phase I Upper for potable water as component of South County reliability Chiquita Reservoir	Construction of off-stream emergency storage reservoir	\$40,150,000	6,180	7/1/06	12/1/07	7/1/07	ongoing	CEQA/NEPA 1/1/04-6/1/06
18	Water Quality/ Habitat Restoration	Mission Viejo	English Creek Aquatic Restoration Study and Implementation Project	Aquatic restoration study to identify alternatives to reestablish a stable, healthy, and sustainable ecosystem/watershed environment through the use of structural and non-structural approaches.	\$2,853,215		7/1/06	7/1/08	7/1/08	7/1/09	CEQA/NEPA 12/1/05-2/1/06
19	Information	San Juan Basin Authority	San Juan Basin GIS	Develop hydrogeologic database, including land use and property ownership, aerial photography, and water quality data, to be utilized as a watershed planning and analysis tool.	\$121,200		n/a	n/a	7/1/06	11/1/06	
20	Aquatic Ecosystems & Watershed Management	San Juan Basin Authority	Environmental Monitoring	Bio-hydro monitoring of connectivity/flow between the surface and groundwater flow regimes to enhance the development and management of groundwater.	\$343,400		n/a	n/a	1/1/07	12/1/08	
Total Priority A Projects					\$176,313,851	27,545					

Table ES-2 2005 IRWM Plan Priority B Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
1	Other	SOCWA	SOCWA/OCSD Enclosed Biosolids Composting Facility	Construct enclosed biosolids and greenwaste composting facility at the Prima Deshecha Landfill	\$32,009,515		9/1/07	7/1/09	2/1/09	continuous	CEQA/NEPA 10/1/05-11/1/06
2	Education	Laguna Niguel	Orange Coast Watershed Center	The Orange Coast Watershed Center will fill the regional need for a venue offering practical public education in the stewardship of watershed, energy and material resources.	\$3,500,000		7/1/09	6/1/10	7/1/10	7/1/12	Design and Bid 7/2008-6/2009
3	Sewage and Flood Management	Laguna Beach / SOCWA	North Coast Interceptor Repair Project	Sewage treatment improvement	\$1,150,000		7/1/05	6/1/06			CEQA/NEPA Complete
4	Water Supply	Santa Margarita Water District / MWDOC	South OC Emergency Storage Reservoirs- Phase II	Construction of reservoirs as component to South County Reliability	\$1,400,000	6,180					CEQA/NEPA to be completed 6/5/2005
5	Water Supply	San Clemente	Well No 8	Installation of new well	\$1,000,000	800					CEQA/NEPA completed 5/1/2005
6	Water Supply	San Juan Capistrano	San Juan Basin Recharge	Recharge San Juan Basin at maximum rate on approx. 25 acres	\$23,400,000	7,500	3/1/08	6/1/09	9/1/09	9/1/12	CEQA/NEPA 6/1/06-12/1/06
7	Water Quality / Habitat Restoration	Rancho Santa Margarita	CURE: Stormwater treatment Vault, Avenida Empressa Creek	Install treatment system for wet and dry weather flows	\$117,800		8/1/06	10/1/06	n/a	n/a	CEQA/NEPA to be completed 7/1/2006
8	Water Quality / Pollution Reduction	San Clemente	San Clemente Watershed Pollutant Source Investigation	Identify sources of pollutants and identify pilot projects to improve water quality	\$500,000		n/a	n/a	n/a	n/a	CEQA/NEPA 7/1/2006-7/1/2006
9	Water Quality / Habitat Restoration	Aliso Viejo	Canyon Vista Emergent Wetland Project	Construction of wetland to enhance habitat, support functions/values, improve water quality, mitigate channel incision, flooding	\$678,000						CEQA/NEPA Complete
10	Sewage and Flood Management	Laguna Beach	Canyon Acres Storm Drain Project	Construct storm drain and diversion junction	\$1,350,000		9/1/05	12/1/05			CEQA/NEPA Complete
11	Sewage and Flood Management	Laguna Beach	Atlantic Way Storm Drain Project	Install subdrain pipe, surface culvert stabilize existing policy	\$325,000		9/1/05	12/1/05			CEQA/NEPA Complete
12	Water Supply	San Juan Basin Authority	Galivan Basin Desalter	Divert Oso surface water to small desalter to be built at MNWD	\$10,000,000	3,000	7/1/07	4/1/08			Design 7/2006-4/2007
13	Water Conservation	Laguna Beach	Laguna Canyon Creek Restoration Project	The proposed project will complete the detailed planning, environmental documents and construction to restore about 5,500 lineal feet of the creek.	\$3,600,000		5/1/08	12/1/08	12/1/08	5/1/13	CEQA/NEPA 4/1/07-12/1/08
14	Water Supply	San Juan Capistrano	Well No 5 and Cooks Wells Development	Develop 3 non-domestic wells in San Juan Basin, rehabilitate well no. 5	\$3,800,000	1,000	12/1/06	10/1/07	n/a	n/a	Mitigated negative Declaration 10/1999
15	Water Supply	Trabuco Canyon Water District	Reclaimed Water	Reclaimed water system expansion	\$2,800,000	700					CEQA/NEPA completed 1/1/2005
16	Water Supply	San Clemente	Segunda Deshesha Urban Runoff Water Quality Project	Installation of UV treatment system to improve water quality of urban runoff	\$1,500,000	n/a/					
17	Water Supply	Trabuco Canyon Water District	Groundwater Treatment Plant	Surface and groundwater protection	\$3,000,000	500					CEQA/NEPA to be completed 5/1/2006
18	Other	TCWD	Water Treatment Plant Security	Security and Surveillance	\$100,000						
19	Water Conservation	Dana Point	Xeriscape Demonstration Garden at Harry Otsubo Community Garden	Revegetation of approximately 700 square feet of the Harry Otsubo Community Garden to plant a demonstration xeriscape garden.	\$8,000		7/1/06	9/1/06			
20	Water Quality / Habitat Restoration	Laguna Beach / Laguna Beach County Water District	Laguna Creek Intg. Coastal Watershed Management Plan	Develop plan to protect Laguna Creek Watershed, improve groundwater, runoff, restore habitat	\$400,000						
21	Water Supply	San Juan Capistrano	Low Flow Capture, Diversion Treatment - San Juan Trabuco Creeks	Capture and treat urban runoff at 10 main storm outlets, low flow diversions into sanitary sewer, water brought to SOCWA recycled water plant	\$2,230,000	150	4/1/07	4/1/08	5/1/08	12/1/08	CEQA/NEPA to be completed 8/1/2006
22	Water Conservation	Laguna Beach	Bluebird Creek Restoration Project	Study and develop plans and infrastructure	\$1,950,000		5/1/08	12/1/08	12/1/08	5/1/13	CEQA/NEPA 4/1/07-12/1/07

Table ES-2 2005 IRWM Plan Priority B Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
23	Sewage and Flood Management	Laguna Beach	Shaw's Cove Sewage Lift Station	Sewer system improvement	\$751,000						
24	Water Quality / Habitat Restoration	San Juan Capistrano	San Juan Basin Inactive Well Inventory and Abandonment	Includes locating and inventorying inactive agricultural wells, as identified in the San Juan Basin Groundwater Management and Facility Plan, for the purposes of properly deconstructing and abandoning the wells.	\$675,000		3/1/2008	12/1/2008			CEQA/NEPA 6/1/06-12/1/06
25	Water Supply	El Toro Water District	Water Transmission Line Crossing Protection	Protect critical and venerable 18" and 24" potable water transmission pipelines	\$150,000		7/1/2006	9/1/2006			CEQA/NEPA 10/2005-6/2006
26	Sewage and Flood Management	San Juan Capistrano	La Novia Bridge Demolition and Reconstruction	Construct new, longer, higher and wider bridge to handle storm flows							
27	Water Supply	Dana Point	Salt Creek Treatment Plant	Water Recycling Facility	\$3,000,000	85	12/1/06	12/1/07	1/1/08	3/1/08	CEQA/NEPA to be completed 6/1/2006
28	Water Supply	Moulton Niguel Water District	MNWD Phase 5 Recycled Water Distribution System Expansion	Proposes Phase 5 of its recycled water distribution system, which will expand the distribution lines to deliver up to 1,400 acre-feet per year of recycled water to 272 existing landscape irrigation services.	\$14,056,000		1/1/12	12/1/24	12/1/14		CEQA/NEPA 3/1/11-9/1/11
29	Water Conservation	San Juan Capistrano	Native Planting Master Plan	Inventory of planted areas in the City, and develop a Master Plan for converting these areas to low water use native plantings.	tbid						
30	Water Quality / Habitat Restoration	Aliso Viejo	Storm Drain Bacterial Mitigation Project	CURE: Will improve water quality by mitigating bacterial loading, which flows into Aliso Creek, and impaired water body.	tbid						
31	Water Quality / Habitat Restoration	Laguna Hills	Oso Parkway Open Space Project	CURE: Conversion of portions of 39 acres of low value landscaping and weeds to high value upland and wetland riparian habitats.	tbid						
32	Water Quality / Habitat Restoration	Laguna Hills	La Paz Open Space Project	CURE: Conversion of portions of 36 acres of low value landscaping and weeds to high value upland and wetland riparian habitats.							
33	Water Quality / Habitat Restoration	Starr Ranch Sanctuary	Bell Canyon Riparian Enhancement Project	Proposes a riparian enhancement project that focuses on the removal of exotic plant species (particularly Vinca major) along the riparian corridor of Bell Canyon within Starr Ranch, followed by enhancement of the native vegetation.	\$281,000		n/a	n/a	5/1/08	4/1/12	Project Design to Completion 5/1/2007-4/31/2012
34	Water Quality / Pollution Reduction	Dana Point	San Juan Creek Nuisance Water Diversions	CURE: Final design and construction of a total of eight diversions within the Dana Point Harbor and the San Juan Creek Watershed within the City of Dana Point.	\$7,500,000		8/1/09	1/1/15	1/1/10	1/1/16	
35	Water Quality / Pollution Reduction	County of Orange	Laguna Niguel Regional Park Irrigation System Retrofit	CURE: Retrofit to reclaimed water with BMPs	\$100,000	40					
36	Water Quality / Pollution Reduction	Laguna Niguel	Divert Pool Deck Drainage to Sewer	CURE: Divert pool deck drainage to sewer at Crown Valley Parkway	\$30,000						
37	Water Supply	County of Orange	Water Harvesting and Re-Use at Laguna Niguel Regional Park	Investigate the feasibility of harvesting urban runoff water from storm drains along Sulphur Creek, and using the water for landscape irrigation at Laguna Niguel Regional Park.	\$290,000		2/1/09	6/1/09	7/1/09	6/1/11	CEQA/NEPA 7/2007-7/2008

Table ES-2 2005 IRWM Plan Priority B Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Post Implementation, Construction, and Monitoring Efforts				NOTES
							Construction		Post Implementation, Construction, and Monitoring Efforts		
							Start	End	Start	End	
38	Water Supply	MWDOC	Ocean Desalination Investigation at Dana Point	Pilot project for ocean desalination; pursuing funding in Proposition 50, Chapter 6.		tbd					
39	Water Supply	MWDOC	Water Transfers for Supply Reliability	Water transfer arrangements; pursuing funding in Proposition 50, Chapter 7.		tbd					
40	Water Supply	MWDOC	Local Water Recycling Projects	Water recycling projects; pursuing funding in Proposition 50, Chapter 7.		tbd					
Total Priority B Projects					\$121,651,315	19,955					

SOUTH ORANGE COUNTY
2005 INTEGRATED REGIONAL WATER MANAGEMENT PLAN
Total Watershed Efficiency

The South Orange County Integrated Regional Water Management Plan has been developed from and coordinates with existing plans and research documents provided by the participating agencies in a manner that identifies and integrates regional projects to improve water supply and quality. This Plan establishes a priority ranking to help further regional efforts to investigate the feasibility of, and identify funding for, these projects. Individual projects however, will go through the appropriate environmental review and permitting process as funding is secured.

CHAPTER 1 INTRODUCTION

Located along the scenic and temperate southern coast of California, South Orange County is rich with history. Legacies passed on from native societies, once expansive cattle ranches, and twentieth century entrepreneurial farmers remain a part of the area's culture today. From the landmark Mission San Juan Capistrano near the stunning western coastline to the Cleveland National Forest in the east, South Orange County continues to be a destination known for beauty and a high quality of life.

Following the national migration trends after World War II that drew citizens to sunbelt cities, the region transitioned into one of the newest areas of urban development in the early 1960's. Several cities incorporated over the subsequent decades, and the population has increased to over 500,000 residents. Most of the coastline is developed, and additional urbanization is anticipated in the backcountry ranch land over the next 20 years. Today, the Region's social and cultural makeup includes a unique mix of equestrian lifestyle, authentic Mexican/Hispanic culture, and a progressive business industry.

The Region's economy has come into its own from the shadows of Los Angeles to the north and San Diego to the south with a unique technological and business infrastructure. This is demonstrated by the diversity of industries represented – from medical devices to construction – as well as intellectual resources to support this diversity. Economic growth slowed in 2002 and accelerated again in 2004. Corporate profits are currently slowing, while the service business, from tourism to retailing to government work, is growing at a pace not seen since 1999. Due to the high quality of life in the Region, home prices continue to be up, as well as associated businesses, including plumbers, brokers, and home-supply store cashiers. Average salaries are projected to rise 2.1 percent per year over the next 5 years. This rate of growth is higher than the 1.6 percent average that characterized the 1997 to 2002 period.² The Region's economy continues to thrive due to its strategic location, modern infrastructure, high quality educational opportunities at all levels, highly trained workforce, diversity and outstanding quality of life.

² Orange County Business Council. Available online: www.ocbc.org (4/13/06).

Water is the key element for sustaining the Orange County and South Orange County economies that allow the region to thrive. Significant investments in water and sewer infrastructure have been made in the past to allow the area to be served on a reliable basis. Planning and investments to carry the Region through the next 25-year planning horizon are critical and are central to preserving the quality of life and the water supply and water quality of the Region.

Reducing runoff and improving the water quality in streams and along the beaches is a key goal for the Region. The beaches are often posted as exceeding State recreational water quality standards, and resources are needed to identify and eliminate the causes of these pollution problems. In addition, the South Orange County water supply is predominately from imported sources, making the region subject to conditions and agencies outside of the Region.

The South Orange County Integrated Regional Water Management Plan is aimed at diversifying water sources by developing a myriad of local opportunities to decrease the reliance on imported sources. For example, the local San Juan Groundwater Basin has been the subject of multiple management programs for treating existing brackish waters and managing wet year supplies for use during dry year conditions; South Orange County is a leader in implementing water recycling projects turning wastewater into a resource; urban water reuse projects are being developed to help reduce runoff and utilize a local resource; and water conservation projects have been a standard for many years including retrofit of plumbing and recent pilot projects using weather-based irrigation controllers. Fiscal resources are also needed to improve the water quality in the local streams to protect the beneficial uses that are listed for these water bodies, and to increase where possible local supply through water reclamation, conservation, stormwater capture/treatment, and groundwater and seawater desalination.

South Orange County is at the forefront of technological and management advances. For example, over the past decade the County of Orange, and south Orange County cities, water and wastewater agencies and interested citizens have been participating in Watershed Reconnaissance and Feasibility studies for the San Juan and Aliso Creek Watersheds conducted by the U.S. Army Corp of Engineers. These were among the first types of efforts that studied the overall health of the watershed and developed recommendations and actions for implementation on a collective basis among the many partners.

Another example is the recently completed Municipal Water District of Orange County and the South Orange County water districts water system reliability study to demonstrate the benefits of additional investments to help prevent Short-term water shortages from facility outages in an area over 90 percent reliant on imported water. This was the first study of this type, stressing the importance of water system reliability investments. The public agency stakeholders of this region are dealing with a myriad of programs that cross over many areas of water supply and water quality issues.

To be more efficient, the Region has embraced the Integrated Regional Water Management Planning Act of 2002 to enhance forward planning in an even more coordinated fashion. This is especially critical with the implementation of the new Total Maximum Daily Load

(TMDL) standards for runoff that are being implemented by the south Orange County cities and the County of Orange.

The County of Orange, cities, water, wastewater and watershed agencies of the South Orange County region have been meeting and discussing the needed programs that integrate many areas of water supply and water quality to determine how to prioritize the programs and projects for the region. These agencies, currently formed as the South Orange County Integrated Regional Water Management (IRWM) Group, are involved in urban water management plans, groundwater management plans, water master plans, watershed planning, and now have combined the efforts of the past decade of planning into an IRWM Plan. The IRWM Group is capturing project and planning elements of the Region within a single plan, the Integrated Regional Water Management Plan.

The South Orange County IRWM Group embraces the IRWM model because it brings together short term and long term management strategies that will protect the water supply and water quality of the region. The South Orange County agencies maintain the belief that water management strategies can and should be integrated to provide a reliable water supply, protect and improve water quality, and achieve other multiple objectives.

The Plan is designed to coordinate water supply, water quality, watershed management options, area wide stormwater programs, and nonpoint source pollution problems that affect the Critical Coastal Area (CCA) and the Areas of Special Biological Significance (marine managed areas).

The purpose of the IRWM Group and its meetings in developing this Plan is to identify potential projects intended to improve water quality and supply in order to investigate their feasibility, engage in long range water planning, to establish priorities among the proposals of the member entities and obtain potential funding. If the Plan is implemented, the County of Orange, as agent of the State of California, will serve as a conduit for funding to the individual agencies proposing the projects. This Plan does not commit any resources to implementation of any project nor does its creation constitute a commitment by the County of Orange or any member entity to carry out any of the proposed projects. Determinations to proceed with individual projects and required environmental review under the California Environmental Quality Act, will be performed by the individual agencies prior to approval of funding.

Agencies within the coastal zone of South Orange County face unique environmental challenges relative to inland areas, including the protection of millions of visitors who utilize the ocean for recreation each year, as well as protection of the unique marine resources from non-point source pollution. Currently, there is no integrated regional management plan or strategy to protect and restore marine resources. Within the South OC IRWM region, the Orange County coastline includes one ASBS area, Heisler Park Ecological Reserve. In addition, there are three locations within the South Orange County IRWM region that are on the CCA listing – San Juan Creek, Aliso Creek, and Heisler Park Ecological Reserve.

The Plan also supports the state priorities that relate to the CALFED Bay-Delta Program, the Clean Beaches Task Force, the Water Recycling Task Force Recommendations, the Water

Desalination Task Force Recommendations, the California Ocean Plan, the Watershed Action Plan, the Non-Point Source Program/Plan, the TMDL List, and the comprehensive Orange County Drainage Area Management Plan (DAMP), along with the Regional Water Boards Watershed Management Initiative Chapters. The Plan does this through the integration of projects and programs that incorporate a wide range of water management strategies. Beneficial effects from implementation of proposed projects and programs will contribute to the goals and objectives of the local, regional and statewide priorities.

1.1 Region Description

The South Orange County IRWM Plan includes the region that encompasses the San Juan Hydrologic Unit in South Orange County, California, as defined by the State Regional Water Quality Control Board, Region 9 Basin Plan. Only the southern portion of the Newport Coast Watershed is included in the Region 9 boundary.

1.1.1 Appropriateness of Region and Geographic Boundaries

The South Orange County IRWM Group determined that the South Orange County region, as defined herein, is an appropriate region for integrated water planning. The South Orange County Region (Region) is part of the hydrogeologic barriers of the San Juan Hydrologic Unit (Unit) within Region 9 of the Regional Water Quality Control Board (RWQCB) boundaries, as shown in the Region Location Map, Figure 1. Also included within the Region is the portion of the Newport Coast Watershed that resides within Region 9. The Unit within Region 9 is a generally trapezoid-shaped area of approximately 500 square miles and covers portions of San Diego, Orange, and Riverside Counties.³ The RWQCB Region 9 – San Diego stretches along 85 miles of scenic coastline from south Newport Beach to the Mexican Border and extends 50 miles inland to the crest of the coastal mountain range.⁴

The Region 9 boundaries make up the border of the Region in the north, and the southern border of the Region is consistent with the borders of Orange County. The Region is generally consistent with the hydrogeologic boundaries in the San Juan Unit. The Unit is comprised of seven major watersheds located within Orange County and two major basins. The watersheds, as shown in Figure 2, include the Newport Coast, Laguna Coastal Streams, Aliso Creek, Dana Point Coastal Streams, San Juan Creek, San Clemente Coastal Streams, and San Mateo Creek. The basins include the San Juan Groundwater Basin and a small portion of the San Mateo Groundwater Basin.⁵

³ California Department of Water Resources. San Juan Valley Basin Description. 11/20/04 Online: http://www.groundwater.water.ca.gov/bulletin118/basin_desc/basins_m-r.cfm#gwb30htm

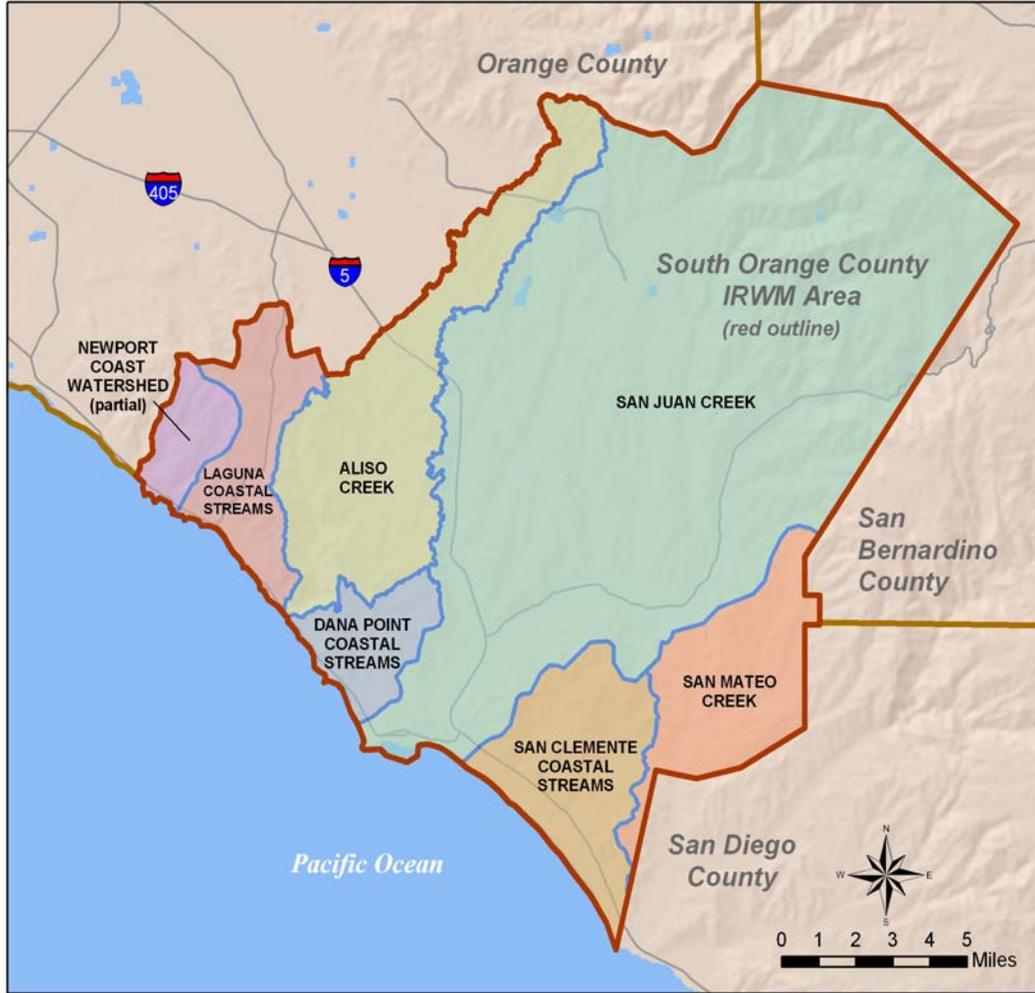
⁴ Regional Water Quality Control Board, Region 9. 12/30/04 Online: <http://www.waterboards.ca.gov/sandiego/>

⁵ County of Orange. Orange County Stormwater Program 2003 Drainage Area Management Plan (DAMP). Appendix D Watershed Chapters. 12/20/04. Online: http://www.ocwatersheds.com/StormWater/documents_damp_chapters.asp



IRWM Region Location Map

Figure 1



IRWM Region Watersheds
Figure 2

The agencies of the South Orange County IRWM Group, as described in Section 1.2., cooperatively work together to provide effective and efficient management of the Region's water and natural resources. The appropriateness of the Region is supported by its congruence with the natural hydrogeologic barriers of the San Juan Hydrologic Unit, the Region 9 Water Quality Control Board, and the collaborative nature of the agencies that strive for efficient and environmentally sound management of the Region's natural resources.

Cities and Special Districts

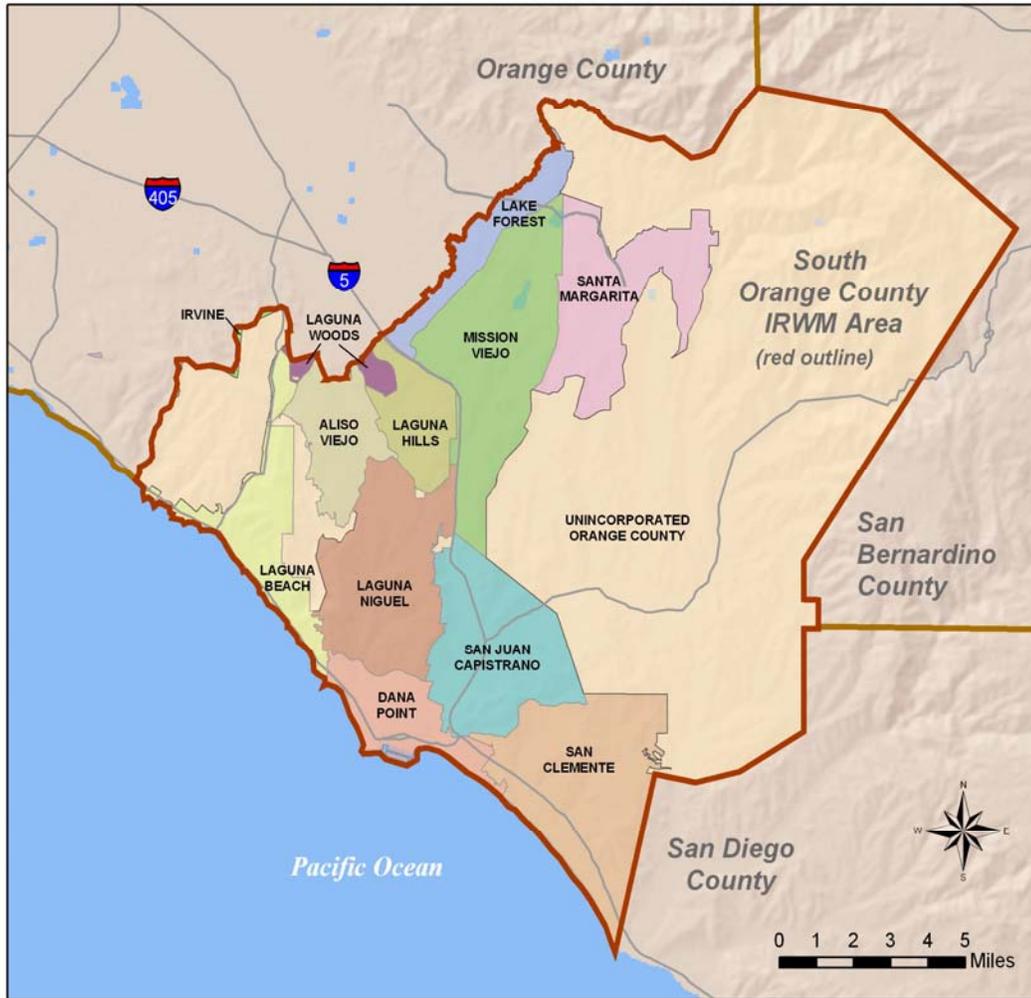
The IRWM Group consists of thirteen cities, county entities, and twelve special districts, as shown in Figures 3 and 4, all of which serve as the beneficiaries of the IRWM Plan.

The IRWM Group cities include the following:

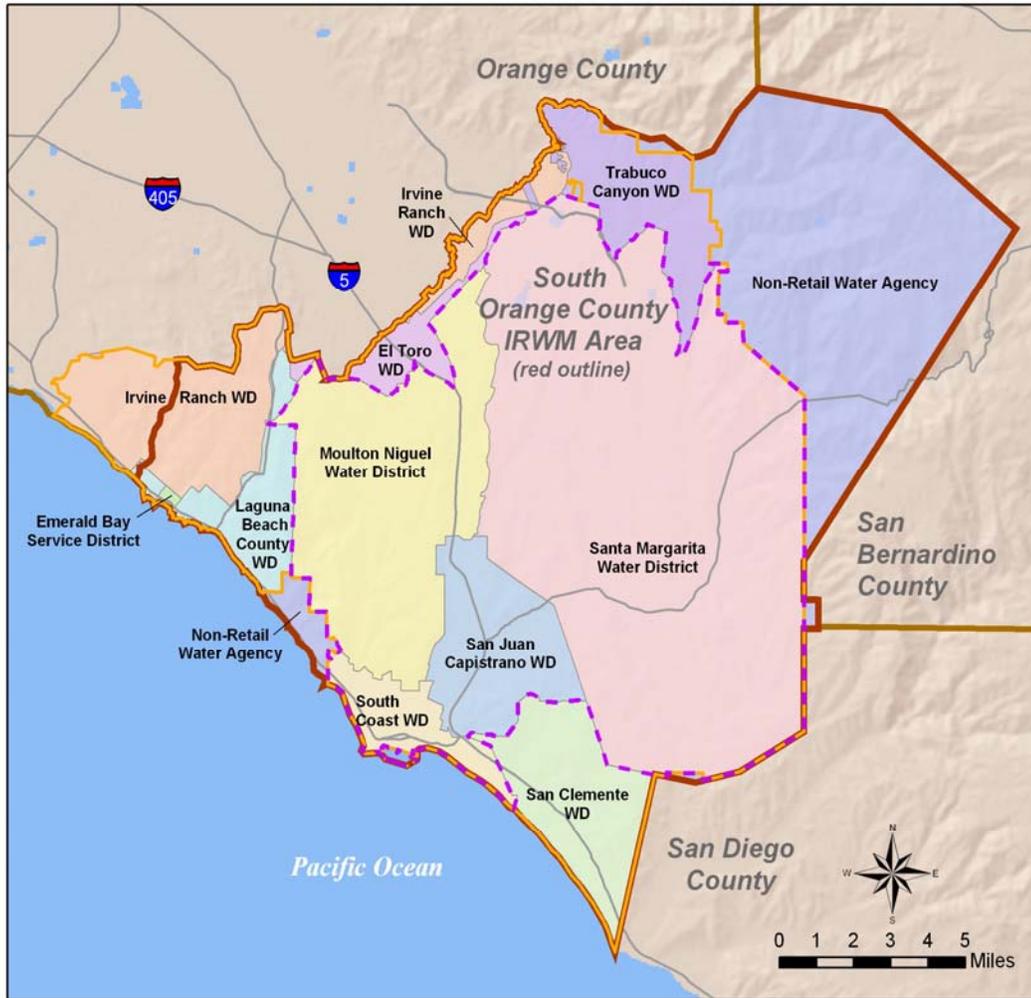
1. City of Aliso Viejo
2. City of Dana Point
3. City of Laguna Beach
4. City of Laguna Hills
5. City of Laguna Niguel
6. City of Laguna Woods
7. City of Lake Forest
8. City of Mission Viejo
9. City of Rancho Santa Margarita
10. City of San Clemente
11. City of San Juan Capistrano

The IRWM Group special districts include the following:

1. El Toro Water District
2. Irvine Ranch Water District
3. Laguna Beach County Water District
4. Moulton Niguel Water District
5. Municipal Water District of Orange County
6. Orange County Flood Control District
7. Orange County Health Care Agency
8. San Juan Basin Authority
9. Santa Margarita Water District
10. South Coast Water District
11. South Orange County Wastewater Authority
12. Trabuco Canyon Water District



IRWM Member Cities
Figure 3



-  IRWM Boundary
-  SJBA Boundary
-  SOCWA Boundary

IRWM Member Districts
Figure 4

Region Watersheds

Within the Region, seven major watersheds and two groundwater basins make up the Orange County portion of the Unit. The Unit and its water bodies are summarized below. Figure 2 illustrates the location of each watershed in the Region. For more detailed descriptions of each watershed, refer to Appendix A and Appendix B.

San Juan Hydrologic Unit

The San Juan Hydrologic Unit is naturally divided by major water bodies.⁶ This hydrologic unit is located in southern Orange County, approximately 50 miles south of Los Angeles and 65 miles north of San Diego. The two major natural surface water bodies within the Unit are San Juan Creek and San Mateo Creek.

Newport Coast Watershed

Most of the Newport Coast Watershed, which covers about 11 square miles, falls within RWQCB-Region 8 with a small southern portion falling within the jurisdiction of Region 9. The Newport Coast Watershed area extends along the Pacific coast south of Corona Del Mar in Newport Beach to just past Emerald Bay Channel in unincorporated Orange County. It is bordered on the north by the Newport Bay Watershed, on the northeast by the San Diego Creek Watershed, and contoured on the east and south by the Laguna Coastal Streams Watershed. Most of this watershed was annexed by the City of Newport Beach in 2002, but the southernmost portion, beginning at Moro Canyon, is within the County of Orange's jurisdiction. Only the Region 9 portion is included in the South OC region for this IRWM Plan.

Laguna Coastal Streams Watershed

The Laguna Coastal Streams Watershed is 11 square miles and consists of the Laguna Canyon Creek watershed, and several smaller coastal-draining sub-watersheds. Laguna Canyon Creek runs north to south, directly through the middle of its watershed, and ultimately discharges into the Pacific Ocean at Laguna Beach. This watershed includes the Heisler Park Ecological Reserve ASBS.

Aliso Creek Watershed

The Aliso Creek Watershed covers 30.4 square miles and its main tributary, Aliso Creek, originates in the Santa Ana Mountains inside the boundaries of the Cleveland National Forest.

⁶ California Department of Water Resources. San Juan Valley Basin Description. 11/20/04 Online: http://www.groundwater.water.ca.gov/bulletin118/basin_desc/basins_m-r.cfm#gwb30htm

Dana Point Coastal Streams Watershed

The Dana Point Coastal Streams Watershed is 6 square miles, located in southern Orange County.⁷ The main tributary of the Dana Point Coastal Streams watershed is Salt Creek, which ultimately drains into the Pacific Ocean near the northern boundary of the City of Dana Point. The Dana Point Harbor is also located within this watershed.

San Juan Creek Watershed

The San Juan Creek Watershed is located in southern Orange County, and is the largest of the Region's watersheds. The approximately 173-square-mile area includes the smaller tributaries of Arroyo Trabuco and Oso Creeks.

San Clemente Coastal Streams Watershed

The San Clemente Coastal Streams Watershed is approximately 18 square miles, located in the southernmost part of Orange County. Prima Deshecha Canada is one of two main streams that flow through the City of San Clemente, ultimately discharging into the Pacific Ocean at Poche Beach.

San Mateo Creek Watershed

The San Mateo Creek Watershed within Orange County is largely unincorporated territory under the jurisdiction of the County of Orange, but includes parts of the City of San Clemente in its downstream-most area. Most of the San Mateo Creek and its outlet to the Pacific Ocean are actually located in San Diego County, thus only a portion of the watershed is within the IRWM Region, covering about 20 square miles of southeastern Orange County.

San Juan Groundwater Basin

The San Juan Groundwater Basin underlies the San Juan Creek Watershed and several tributary valleys in southern Orange County. The groundwater basin is bounded on the west by the Pacific Ocean and otherwise by tertiary semi-permeable marine deposits. The valley fill alluvium, including the three sub-basins, occupies approximately 11,700 acres.⁸

San Mateo Groundwater Basin

The San Mateo Valley Groundwater basin underlies San Mateo Valley and Christianitos Canyon in southeastern Orange County and northwestern San Diego County. The basin is bounded by the Pacific Ocean on the west and elsewhere by semipermeable tertiary marine sedimentary rocks.⁹

⁷ County of Orange. *Annual Report, Watershed Chapter*. FY 2003-2004.

⁸ California Department of Water Resources. Bulletin No. 104-7 *Planned Utilization of Water Resources in the San Juan Creek Basin Area*. June 1972.

⁹ Regional Water Quality Control Board, 1994.

1.1.2 Regional Ecological Processes and Environmental Resources

The Region's seven major watersheds include ecological processes that create environmental resources. Although ecological resources of the Region continue to be studied and explored, several beneficial uses of the Region's environmental resources have been identified for each of the seven major watersheds. Below is a brief summary of the region's environmental resources for each watershed. See Appendix A for additional information on the watersheds.

Newport Coast Watershed

The Newport Coast Watershed is shared by several jurisdictions. Most of this watershed was annexed by the City of Newport Beach in 2002, although the southernmost portion, beginning at Morro Canyon, is within the County of Orange's jurisdiction. The southern portion of the watershed is within Region 9 of the RWQCB boundary, while the northern portion is within Region 8 of the RWQCB. Only the Southern portion of the Newport Coast Watershed will be included in the South OC region to maintain consistency with RWQCB Region 9.

In the past few years, Newport Beach and other local entities have faced watershed problems involving streambed instability as exhibited by head-cutting and slope failures, the arrival of invasive plant species (*Arundo donax* and other exotic pest plant species), and the loss of native wetland and riparian habitat. Seven of the canyon streams now flow year round due to over irrigation in the upstream developments. It is suspected that the dry-weather flows carry bacteria, fertilizer, and pesticides through the canyon reaches and into the ocean.

There has been a confluence of separate investigations and projects being carried out in the Newport Coast area by the City of Newport Beach, The Irvine Company, County of Orange, Irvine Ranch Water District, Orange County Coastkeeper, and Surfrider Foundation. In order to address the destabilization and degradation of the watershed's coastal canyons in a systematic and effective manner, the City of Newport Beach's Public Works Department and City Manager's Water Quality Division have proposed the creation of a watershed program for the Newport Coast as an organizing tool for future activities in the watershed and were the lead in proposing for grant funding. As part of this watershed program, a monitoring program will specify biological indicators and metrics to assess and monitor ecosystem health relative to watershed function. Examples of applicable indicators might include biomass of native riparian wetland vegetation, habitat use by declining or sensitive species, attached fresh-water algae, aquatic macro-invertebrate diversity and distribution, and the health and diversity of intertidal and subtidal communities in the marine life refuges. Additional indicators will be selected in consultation with Regions 8 and 9, and the County of Orange. In addition, the watershed program will include a program for mapping the areas of *Arundo* and instituting a removal program.

Laguna Coastal Streams Watershed

The Laguna Coastal Streams Watershed is within the jurisdiction of the San Diego Regional Water Quality Control Board (Region 9). To protect the resources, the *Laguna Canyon Creek Habitat Restoration Project* was initiated. The City of Laguna Beach is evaluating the

possibility of restoring approximately 4,000 linear feet of the Laguna Creek. Potential restoration activities may include the following: (1) removal of debris and trash, and development of a more natural channel configuration constructed of permeable, vegetation-holding materials; (2) re-grading of the site; and (3) revegetation of the corridor with native riparian species. The project is also intended to contain a public education component that integrates public outreach and education of outlying neighborhoods, as well as of visitors to the restoration site. The performance criteria include habitat expansion and quality. The Heisler Park Ecological Reserve is an ASBS located in this watershed, and protection of the reserve are underway through stringent coastal planning efforts between the City of Laguna Beach, City of Newport Beach, Irvine Company, County of Orange, California State Parks and Caltrans.

The City of Laguna Beach also constructed a small wetlands restoration project that has incidental water quality improvement benefits, among them, water polishing and sediment and nutrient retention. Performance criteria include habitat expansion and quality.

Aliso Creek Watershed

As outlined in the Aliso Creek Watershed Management Plan, the watershed suffers from a number of problems related to water resources.¹⁰ The identified problems are grouped in four general categories: creek instability, water quality, loss of fish and wildlife habitat, and flooding damages.

Watershed management has become necessary in order to decrease negative impacts of human activities and to increase the positive impacts. Economic resources are necessary to enable the community to address and solve resource problems such as nonpoint source pollution. Establishment of a goal-oriented management program can prevent problems before they occur and will result in less expensive and more efficient use of community energy. The Aliso Creek Mainstem Ecosystem restoration spin-off Study will begin in 2005.

Efforts to accomplish the needed improvements will include programs to reach several listed objectives of the plan. These objectives are measurable milestones that will enable the community to track progress toward maintaining a natural balance in watershed resources. Most of the objectives promote and encourage practices and behaviors that support development of a healthy environment for the watershed. Education is therefore a major component of this management program, as well as enhanced public outreach to promote a more complete understanding of the environmental problems and the ecological value of the Aliso Creek Watershed.

Dana Point Coastal Streams Watershed (Salt Creek Watershed)

The Dana Point Coastal Streams watershed is the smallest watershed in Orange County and is almost fully developed. Priority concerns for the watershed include high levels of bacteria

¹⁰ County of Orange. Aliso Creek Watershed Plan. 12/20/04. Online:
http://www.ocwatersheds.com/watersheds/alisocreek_watershed_management_toc.asp

affecting Salt Creek Beach and Baby Beach, and nuisance flows and environmental issues at the Dana Point Harbor.

The City of Dana Point is in the midst of construction of an innovative state-of-the-art urban runoff treatment system. The Salt Creek Ozone Treatment Plant treats the large flows of urban runoff discharging to Salt Creek Beach, which has been plagued by beach posting due to high levels of bacteria. The project completion is anticipated by the end of the fall 2005. The City looks forward to the water quality improvements at Salt Creek Beach, though reduction and elimination of nuisance flows will be a continued long-term effort for the entire watershed. The City is also investigating potential uses for the treated urban runoff, namely as reclaimed water for irrigation.

Another priority in the watershed is the water quality issue found at Dana Point's "Baby Beach" that results in chronic postings due to high bacteria levels. The County of Orange, in cooperation with the City of Dana Point, has developed and will implement a circulation pilot project to evaluate the potential positive effects of circulation on reducing bacterial test contamination in waters along the shore in Baby Beach. The City is also requesting assistance from the Army Corps of Engineers, who originally constructed the Harbor breakwaters and jetties, to determine what can be done to remedy the effects of the altered ocean currents which continue to diminish water quality in the Harbor. A diversion project at one of the outlets at Baby Beach is currently under construction, eliminating one source of polluted dry weather flows to the beach area. Further investigation is required to determine what impacts the sediments may have on the high levels of bacteria found in the beach waters. It is thought that the sediments themselves may be harboring bacteria which could be a significant contributor to the bacteria levels in the water.

The Dana Point Harbor requires mitigation measures to address environmental concerns. A project to renovate the Dana Point Harbor is currently in the planning stages. This project has involved significant coordination among the cities and other stakeholders via project meetings. The project is being designed to include several water quality BMP features.

Also related to Harbor activities is the July 24, 2003 request issued by Region 9 for technical studies in San Diego Bay, Mission Bay, Oceanside Harbor, Del Mar Boat Basin and Dana Point Harbor. This request focuses on a report that details a proposed coordinated comprehensive water quality monitoring program covering all five harbors in the Region 9 area. Region 9 recommends that this effort be coordinated through the Southern California Coastal Water Research Project based on their considerable experience in developing regional coastal monitoring programs.

San Juan Creek Watershed

San Juan Creek empties into Doheny Beach, which is frequently posted as exceeding State recreational water quality standards. Orange County Public Health Laboratory of the Orange County Health Care Agency (OCHACA) was subcontracted by the County of Orange to carry out a bacterial watershed study of San Juan Creek. Some conclusions of the study include: bacterial pollution measured by standard fecal indicator organisms was ubiquitous in storm drains and creeks in the San Juan Creek Watershed, storm drains are a major source of

dry weather pollution, mean concentrations of indicators were not indicative of large or moderate levels of direct sewage contamination, indicator concentrations were markedly higher downstream compared to upstream, bacterial contamination was not limited to urban areas, and the methods of bacteria source tracking tested did not demonstrate sufficient accuracy and further studies are needed to validate source tracking methods using quality assurance testing. These conclusions will be further investigated in more detail and specificity in the proposed Doheny State Park Beach/San Juan Creek Investigation and Implementation Project.

In addition, a comprehensive watershed management study is being prepared by the U.S. Army Corps of Engineers for the San Juan Creek Watershed. This analysis has been underway for several years, and will serve to enhance understanding of the ecological and environmental processes within the watershed, so that better water quality, flood control, and environmental mitigation decisions can be made. It is currently in the Feasibility Study phase.

San Clemente Coastal Streams Watershed

To maintain high quality water in the San Clemente Watershed, the City of San Clemente began sampling 15 locations throughout the San Clemente Coastal Watersheds in July 2003, as part of a dry weather water quality monitoring program. The developers of Talega (a large residential and commercial development area within the City) are sampling two additional sites at the downstream boundary of their project. The program is being conducted in accordance with the City's guidance included in the permit issued by the Regional Board. Once collected, the data will help the City to characterize dry weather flows and detect illegal discharges into the City's storm drainage system.

In coordination with the City of San Clemente, the County of Orange has contracted with Weston Solutions/MEC Analytical Systems (MEC) for a source tracking investigation that will identify spatial patterns of indicator bacteria sources at five locations in the Prima Deshecha channel. Bacteria load, which is the product of flow and concentration, will be assessed during three 24-hour surveys during the dry summer months. In addition to the spatial patterns of the bacteria, microbial source tracking (MST) techniques will be used to identify the host origin of the bacteria within the watershed. The same approach will be utilized as was recently used to assess the sources of indicator bacteria in Mission Bay (San Diego County). Results of the study will indicate which animal species, including human, contribute most to the bacterial problem that much of the region's surface and ocean waters experience. This will enable agencies to direct resources to the appropriate and achievable areas of bacterial reduction, rather than directing funds at programs that yield little real reduction. The study by MEC has begun and will be complete by late 2005.

Poche Beach is located at the mouth of the Prima Deshecha Canada Channel and lies on the border between the cities of Dana Point and San Clemente. The beach has been routinely posted for exceedances of the AB 411 fecal indicator bacteria standard when tested in the surf zone. In 2001, Poche Beach was provided Proposition 13 funds through the Clean Beaches Initiative to improve water quality by the construction of a UV bacteria disinfection system at the mouth of the channel under Coast Highway. San Diego RWQCB, Region 9,

issued a 13225 Directive on July 3, 2002, mandating that a source tracking study, BMP study findings and an implementation schedule of the UV installation be provided to Region 9. The UV treatment BMP was installed and operated during summer 2003 and summer 2004.

Another source tracking investigation in Orange County is being conducted by Southern California Coastal Water Research Project (SCCWRP) in collaboration with the University of California Irvine, County of Orange Health Care Agency, RWQCB (Region 9) and the County of Orange. This group has proposed a source identification investigation to protect the environmental resources of the region, and is in the planning stages.

San Mateo Creek Watershed

The majority of the San Mateo Creek Watershed is undeveloped, with no plans for future use at this time except for a small portion that is being developed within the City of San Clemente. The Ranch Plan has amended the General Plan to include development in a portion of the watershed located in the County of Orange.¹¹ Due to the current undeveloped nature of the San Mateo Creek Watershed within Orange County, County-led efforts focusing on the establishment of a long-term Watershed Management Framework have been limited. However, the protection of the environmental resources in the watershed has supported the need to create a watershed management plan. The future watershed management framework could take many forms, among them coordination with on-going activities of the Donna O'Neill Land Conservancy, or participation in the broader San Mateo Creek Watershed initiatives with State Parks, the U.S. Marine Corps, and San Diego County. Regardless of the form, watershed plans for the San Mateo Creek Watershed will be designed to protect and enhance the water quality and environmental resources.

1.1.3 Regional Water Resources

Two distinct but related issues must be addressed for South Orange County's regional water resources: 1) The imported water supply upon which the Region is dependent; and 2) the local water supply which improves the Region's water supply and system reliability. The imported water supply accounts for more than 90 percent of the Region's potable water supply, and is obtained through the regional wholesale agencies. The local water supply, though smaller in amount, is in many ways much more critical in that it involves not only developing a usable supply to improve overall water supply reliability, but also requires maintaining and protecting the area's ecological functions dependent on the availability of high quality surface water and groundwater. Table 1.1.3-1 shows the target levels of new supply to be developed within the Region between 2005 and 2030.

The following discussion briefly describes the current circumstances of imported and local water resources in South Orange County. The projects and programs that address the many challenges presented by the local and imported water supplies are discussed in further detail

¹¹ The Ranch Plan is a land-use management and open space preservation plan for the balance of the Rancho Mission Viejo Lands (approximately 23,000 acres) located in South East Orange County.

in Chapter 4 and in Appendices G and H, Regional Water Supply Planning and IRWM Plan Project Descriptions, respectively.

Table 1.1.3-1 South Orange County Region New Supplies 2005 to 2030

Local Supply	Supply Developed 2005 to 2030 (AF)	Percent of 2030 Demands
Water Use Efficiency ⁽¹⁾	10,000	6%
Recycling ⁽²⁾	18,000	10%
Potable Groundwater ⁽³⁾	10,000	6%
Ocean Desalination ⁽⁴⁾	15,000	9%
Total ⁽⁵⁾	53,000	30%

- (1) WUE is really a demand reduction, but is presented as a supply in this comparison.
- (2) Recycling includes conventional as well as creek flow diversions put to beneficial uses
- (3) Includes San Juan Basin desalter, San Clemente well, South Coast desalter and potential expansions thereof.
- (4) Target for Dana Point ocean desalination project. As of 2005, a decision on the final feasibility has not yet been determined; work is proceeding.
- (5) Does not include supplies developed in Region 9 portion of IRWD

Imported Water Supply

Making the necessary investments to provide an adequate water supply to meet demand remains a critical requirement for the Region. Population changes, economic conditions, and hydrologic conditions each influence water demand in South Orange County. As the region is rapidly expanding its housing base, the population and business base will dictate the future water needs. Thus, as South Orange County is heavily reliant on imported water, the demand for imported supply is estimated to expand with the population, although successful conservation efforts and a decrease in agricultural land uses are expected to abate the growth rate of water demand. Nevertheless, as Tables 1.1.3-2 and 1.1.3-3 indicate imported water will continue to be the principal source of supply to the Region in the foreseeable future, while efforts to develop alternative sources will alleviate some of the Region’s dependency.

It is expected that the increasing need for potable supplies will be offset by the increased implementation of water conservation programs and increased development of water reclamation systems for irrigation and industrial uses.¹² Therefore, the projected per-capita usage for South Orange County is expected to remain stable or decrease. Table 1.1.3-2 shows projected water demand for South Orange County for the 20-year planning horizon.

¹² Moulton Niguel Water District, UWMP 2000

Table 1.1.3-2 South Orange County Consumptive Water Demand Projections

Water Agency	Water Demand Projection (AFY) ¹					
	2004-05	2009-10	2014-15	2019-20	2024-25	2029-30
El Toro WD	11,540	11,575	11,575	11,575	11,575	11,575
Laguna Beach CWD	4,770	4,850	4,900	4,950	5,000	5,000
Moulton Niguel WD	42,500	44,900	45,200	45,700	46,200	46,700
City of San Clemente	11,454	12,090	12,800	13,400	13,400	13,400
City of San Juan Capistrano	10,715	12,760	13,300	13,840	14,230	14,281
Santa Margarita WD	35,032	39,562	43,185	47,994	51,381	51,408
South Coast WD	7,992	8,919	9,051	9,186	9,310	9,310
Trabuco Canyon WD	3,664	5,700	6,030	6,272	6,490	6,638
Total	127,667	140,356	146,041	152,917	157,586	158,312

Source: MWDOC Agency Projections, May 2005

¹ Does not include a portion of Irvine Ranch Water District that lies within RWQCB - Region 9 area that has a demand of approximately 2,800 AF in 2005 and projected to grow to about 3,400 AF by 2030.

Water Supplies

South Orange County obtains most of its water supply from imported water, about 94% of potable and 81% of total demands with recycled supplies and limited groundwater supplies accounting for the balance (6% of potable and 19% of overall).

Direct use water supply sources are in five distinct categories: imported water, groundwater, surface water, recycled water and desalted water. Existing and projected non-imported potable supply source quantities for each South Orange County water agency are listed in Table 1.1.3-3. Recycled (non-potable) water supply projections are shown in Table 1.1.3-4.

Table 1.1.3-3 South Orange County Non-Imported Potable Water Supply Projections

Water Agency	Non-Imported Potable Water Supply Projections (AFY) ¹					
	2004-05	2009-10	2014-15	2019-20	2024-25	2029-30
El Toro WD	-	-	-	-	-	-
Laguna Beach CWD	-	2,225	2,225	2,225	2,225	2,225
Moulton Niguel WD	-	-	-	-	-	-
City of San Clemente	720	1,100	1,100	1,100	1,100	1,100
City of San Juan Capistrano	2,909	5,920	5,920	5,920	5,920	5,920
Santa Margarita WD	-	150	150	150	150	150
South Coast WD	-	1,300	1,300	2,000	2,000	2,000
Trabuco Canyon WD	400	400	400	400	400	400
Total	4,029	11,095	11,095	11,795	11,795	11,795

Source: MWDOC Agency Projections, May 2005

¹ Does not include a portion of Irvine Ranch Water District that lies within RWQCB - Region 9 area that has potable supplies of approximately 2,400 AF in 2005 and projected to grow to about 2,800 AF by 2030.

Table 1.1.3-4 South Orange County Non-Potable (Recycled) Supply Projections

Water Agency	Non-Imported Non-Potable Water Supply Projections (AFY) ¹					
	2004-05	2009-10	2014-15	2019-20	2024-25	2029-30
El Toro WD	375	575	575	575	575	575
Laguna Beach CWD	-	-	-	-	-	-
Moulton Niguel WD	7,700	10,000	11,500	11,500	11,500	11,500
City of San Clemente	250	1,200	1,700	2,300	2,300	2,300
City of San Juan Capistrano	460	2,000	2,500	3,000	3,350	3,350
Santa Margarita WD	5,390	9,813	11,906	13,798	15,655	15,655
South Coast WD	890	1,000	1,000	1,000	1,000	1,000
Trabuco Canyon WD	850	950	1,000	1,000	1,000	1,000
Total	15,915	25,538	30,181	33,173	35,380	35,380

Source: MWDOC Agency Projections, May 2005

¹ Does not include a portion of Irvine Ranch Water District that lies within RWQCB - Region 9 area that has non-potable supplies of approximately 400 AF in 2005 and projected to grow to about 600 AF by 2030.

Since South Orange County imports a predominant amount of its water needs from outside of the area, it is not surprising that the southern part of the county is concerned about either planned or emergency outages of the import system that could be caused by natural or man-made events resulting in a disruption of water supply. Supply concerns could be caused specifically by:

- Emergency shutdowns or outages of facilities such as Metropolitan’s Diemer Water Filtration Plant or major supply pipelines;
- Prolonged droughts on either or both of the State Water Project or Colorado River Aqueduct imported water systems; or
- A lack of implementation of other planned local water projects so that growth needs are not met.

One of the goals of the IRWM Plan is to for all of the South Orange County agencies to work together to make the necessary investments to mitigate or minimize impacts from these types of events. Development of local supply sources, regional interconnections and lined and covered reservoir storage will help to protect the South Orange County system. Water transfers from outside of the region will also be beneficial to add a layer of insurance with respect to future droughts on the State Water Project or Colorado River system.

Local Water Supply

Metropolitan and MWDOC have both developed complementary strategies to help insure the continued delivery of high-quality imported water supplies. Water remains a valuable resource and it is imperative that Southern California continues to develop and implement alternative strategies to meet the demands of a growing population. The IRWM Plan is consistent with the strategies of these regional water agencies, and like them, emphasizes a diversification of supplies.

- Water Use Efficiency practices focus on the 14 Best Management Practices (BMP's) for urban water use efficiency in California and include home water surveys, low-flow showerhead and toilet retrofits, metering with commodity rates, landscape irrigation budgets, education, public information, conservation based rate structures, water waste prohibitions, and industrial process water improvements. These BMP's offer cost-effective opportunities to moderate the amount of imported and local water supplies required by municipal and industrial users. These programs are offered both regionally by MWDOC and locally by individual water agencies.
- Recycling already occurs at a significant level in South Orange County, but efforts can be extended to satisfy additional needs, particularly non-domestic demands for irrigation uses. Local recycling systems require upgrades and expansions to continue to maximize and increase supplies.
- Groundwater recovery has begun on the San Juan Creek Groundwater Basin, and more projects to utilize this resource are proposed.
- Ocean water desalination processes continue to decrease in cost, making potential use more fiscally appealing. A more comprehensive investigation has begun in South Orange County to evaluate potential impacts and to locate a possible site for such a plant.
- Surface water capture and treatment for potable and non-potable supply, groundwater basin recharge, and improved riparian habitats is also considered a critical aspect of local water supply, and efforts to improve surface water quality are progressing through the use of BMPs.

Water Quality

The quality of imported water is high in South Orange County. However, the Region's transformation into urbanized spaces has placed considerable stress on the quality of its local water resources. Dry and wet weather surface flows have increased due to a reduction of absorbent landscape and an increase in impermeable coverage. Increased stream flows often lead to erosion of riparian habitats. Furthermore, both streambed and overland flows carry

pollutants endemic to urbanized areas, increasing pollutant loading in the Region's seven watersheds and coastline.

Efforts to understand and mitigate the various water quality issues in the Region have been ongoing. One recent advancement is the promotion of weather-based irrigation controllers. These devices receive information regarding the climate and adjust the timing of the station runs automatically to apply the appropriate amount of water. In addition, they will result in less runoff and thus less transport of sediments and pollutants through the water ways and into the ocean environment. The promotion of these devices is just beginning under a program developed by the Municipal Water District of Orange County. The market potential for improved irrigation efficiency in South Orange County with these devices is significant.

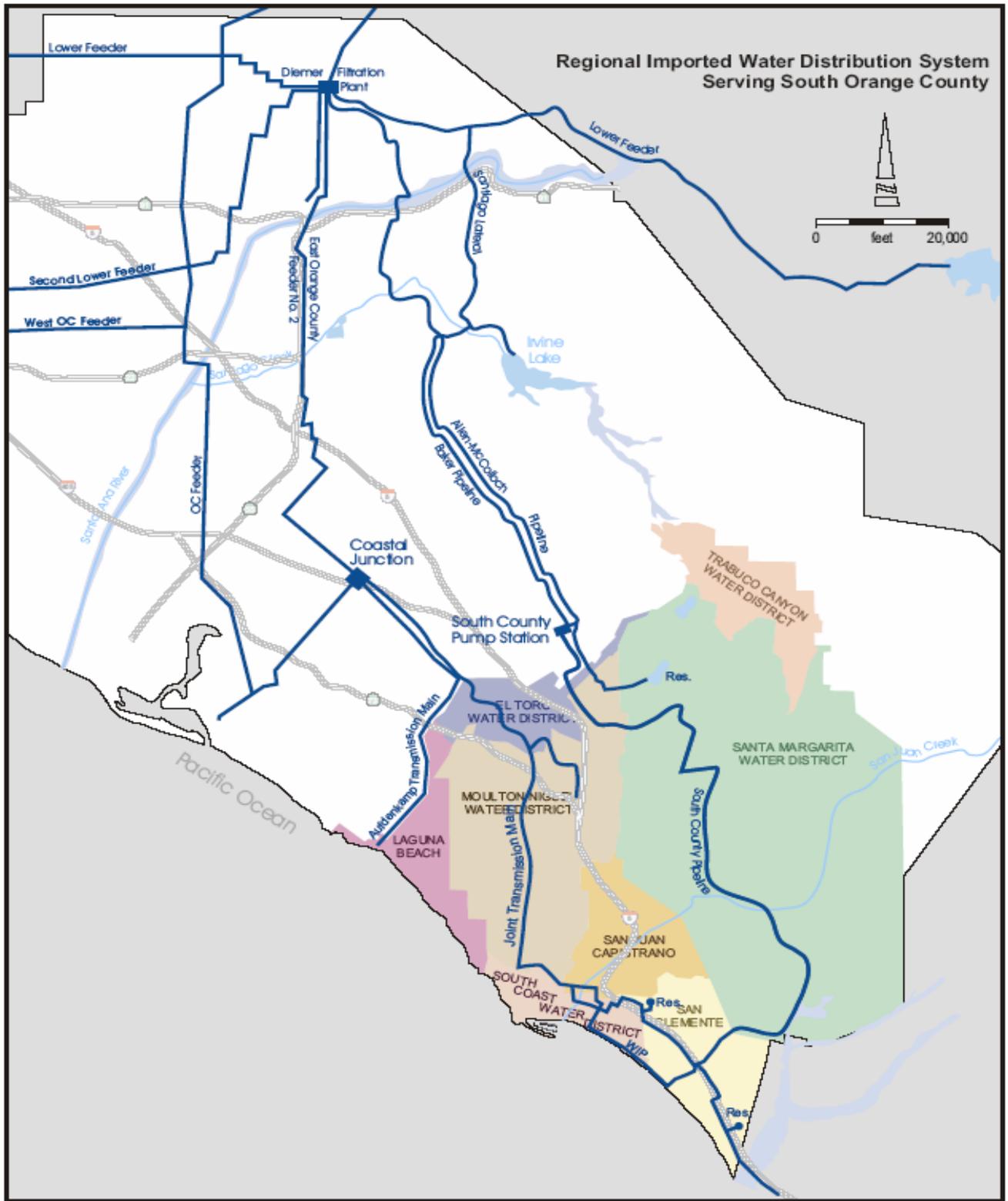
In addition, the County of Orange, the cities within Orange County, and the Orange County Flood Control District have cooperatively developed and implemented a comprehensive Drainage Area Management Plan (DAMP) to reduce pollutants, enhance water quality, educate the public, and monitor progress in improving water quality. The numerous programs and data sets generated through the cooperation of these agencies illustrate the commitment of the Region to improve water quality. A report for each watershed in South Orange County is generated annually to monitor the collaborative progress made within each watershed's boundaries. In 2003-04, advancements in BMP implementation, educational outreach programs, and plans to create or improve individual watershed plans were commonly executed activities to raise water quality levels and enhance local ecosystem functions.

1.1.4 Regional Infrastructure

As discussed, South Orange County currently relies on the delivery of water supplies, made possible through an extensive infrastructure network. The Metropolitan Water District of Southern California is the regional wholesaler of imported water, bringing in supplies from the Colorado River through the Colorado River Aqueduct, and from northern California through the California Aqueduct. As shown in Figure 5, South Orange County's imported water supply is treated at the Diemer Filtration Plant in Yorba Linda, and transported through two major pipelines to the southern portion of the county; the East Orange County Feeder No. 2 and the Allen McColloch Pipeline. Local delivery is then facilitated primarily through the Aufdenkamp Transmission Main, the Joint Transmission Main, and the South County Pipeline into each local water supplier's infrastructure, including distribution mains, pump stations, reservoirs, wells, and other system components.

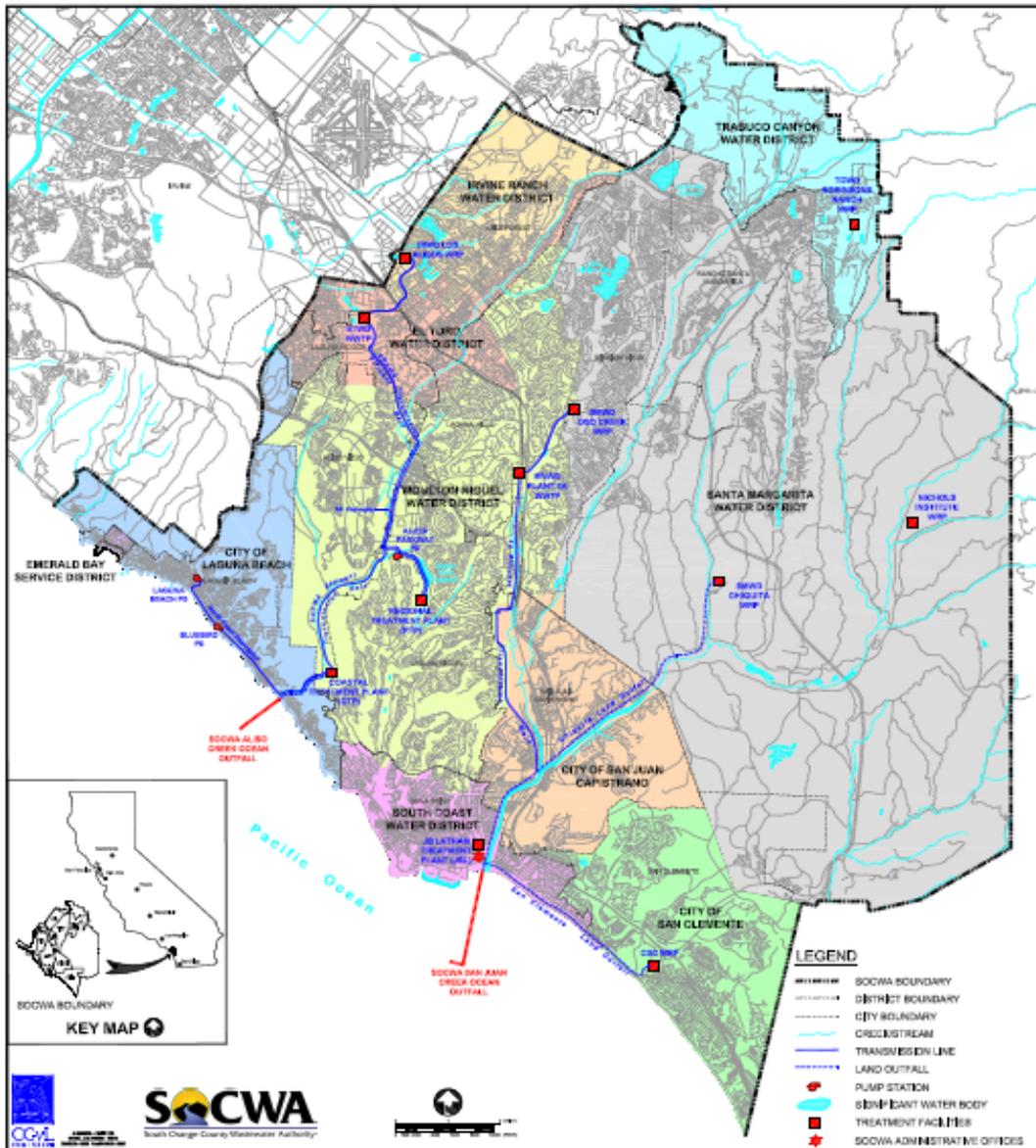
Additionally, South Orange County's wastewater is managed by the South Orange County Wastewater Authority (SOCWA). SOCWA serves 10 member agencies, including the majority of the cities in the Region as well as special districts. Figure 6 shows SOCWA's service area, the agencies it serves, and the wastewater system and facilities. SOCWA's purpose is to plan for, acquire, construct, maintain, repair, manage, operate and control facilities for the collection, transmission, treatment and disposal of wastewater, the reclamation and use of wastewater for beneficial purposes, and the production, transmission, storage and distribution of non-domestic water for the mutual benefit of SOCWA's ten member agencies and the general public in South Orange County.

Figure 5¹³
Regional Imported Water Distribution System and Water Agencies



¹³ MWDOC, South Orange County Water Reliability Study, 2004.

Figure 6
SOCWA Regional Wastewater System



1.1.5 Regional Demographics

Table 1.1.5-1 shows the population served by the water agencies is approximately 535,000. South Orange County supports a major portion of Southern California’s growing population. As real and projected populations continue to increase, appropriate management of the Region’s water and other natural resources is essential. The IRWM Plan addresses regional demographics through effective management of its precious resources. Table 1.1.5-2 reflects the City populations; although the Regions’ population is approximately 595,000, since only a portion of some cities is included in the South OC IRWM Region.

Table 1.1.5-1– South OC IRWM Plan – Water Service Agency Population

Water Agency	2004 Population Served ¹⁴
El Toro Water District	50,800
Laguna Beach County Water District	24,500
Moulton Niguel Water District	164,100
San Clemente Utilities Division	47,261
San Juan Capistrano Water Services Department	37,715
Santa Margarita Water District	144,000
South Coast Water District	40,000
Trabuco Canyon Water District	12,824
IRWD ¹⁵	13,725
Total	534,925

Table 1.1.5-2 – South OC IRWM Group – City Populations

South Orange County City	2004 Population ¹⁶
City of Aliso Viejo	44,833
City of Dana Point	36,532
City of Laguna Beach	24,774
City of Laguna Hills ¹⁷	27,144
City of Laguna Niguel	65,669
City of Laguna Woods ¹⁸	8,783
City of Lake Forest ¹⁹	24,325
City of Mission Viejo	97,752
City of Rancho Santa Margarita	49,023
City of San Clemente	63,079
City of San Juan Capistrano	35,834
County of Orange ²⁰	(58,475)
Total	594,951

¹⁴ Information provided by each individual agency.

¹⁵ Reflects the portion of IRWD that serves the City of Lake Forest located within South Orange County.

¹⁶ Center for Demographic Research, Population Data for Orange County Cities as of July 2004.

¹⁷ 82.23% of total population is in South Orange County Region.

¹⁸ 48.03% of total population is in South Orange County Region.

¹⁹ 31.32% of total population is in South Orange County Region.

²⁰ 51.85% of total population is located in South Orange County Region.

1.1.6 Disadvantaged Communities

The IRWM Group objectives include **safe drinking water**, water quality improvement projects and programs aimed at protecting the population as a whole including residents who represent the disadvantaged population of the area. Additionally, addressing water quality issues in areas of recreational use, the IRWM Plan incorporates environmental justice in a way that provides every resident an equal opportunity and fair treatment in the regional water planning process. To further substantiate the importance of including regional minority communities, the South Orange County IRWM Group has collaborated with Juaneno Band of Mission Indians and Hispanic community groups, including the National Hispanic Environmental Council to ensure their active involvement in the IRWM Plan.

South Orange County includes several areas where the average median household income is less than 80 percent of the statewide annual median household income. The majority of the low socioeconomic population is Hispanic. There are several areas of low cost housing and subsidized housing that service South Orange County's disadvantaged communities. One clear measure of this community is that the Camino Health Clinic in San Juan Capistrano serves the poor, the underinsured and the uninsured and in 2004 they serviced 84,894 patients of which the majority were Hispanics whose income is in line with the State's formula for disadvantaged populations. As stated by the Director of the Camino Health Clinic, "Ninety-eight percent of the patients treated at the Camino Health Clinic are below the poverty level."

Of the nearly 600,000 residents in South Orange County, it is estimated that over one-fourth of the population are disadvantaged and live at or below the poverty level. **In 2002, the recreational areas of Doheny State Beach Park (close to 2 million day-use visitors per year), the Dana Point Harbor, and other area beaches are the main recreation areas for these communities and are used heavily year round.²¹ In 2002, approximately 25 percent of the nearly 2 million visitors did not drive into the park and entered free of charge.²²** All of these recreational areas are accessible via public transit, and often do not charge an entrance fee for walk-in visitors, making these sites an ideal option for inexpensive, quality recreational, educational and cultural experiences for both local residents and disadvantaged communities. **Specifically, the Aliso Creek Water Quality SUPER project (projects 8 and 9 of the Priority A Projects) will implement water quality measures to provide clean waters for the disadvantaged communities members to recreate.**

Portions of the watersheds that drain into these beach areas are impaired by excess runoff and pollutants. The IRWM Plan includes several projects to identify the cause of water pollution for Doheny Beach and other beaches within the Region. It is particularly important to address water quality in order to protect the health and safety of the entire population in the area, especially for the disadvantaged residents that do not have the means to travel to other areas of the state or country.

^{21,22} Doheny State Beach Preliminary General Plan and Draft EIR, Section 2.1.5 Park Users, Page 2-12, December 2003, <http://www.parks.ca.gov/pages/21299/files/dohensybfinalgeneralplan&eir.pdf>

1.2 South OC Integrated Regional Water Management Group

The Region consists of multiple population centers, including the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. See Appendix C for detailed descriptions of each City.

Within these cities, the agencies participating in the development of the IRWM Plan shown in Table 1.2-1 from the South Orange County IRWM Group. This diverse group came together as a single planning unit to create stronger regional partnerships and connectivity, to maximize the efficiency of their efforts, and to develop a comprehensive, integrated and balanced IRWM Plan.

Table 1.2-1 – South Orange County IRWM Group

California State Parks	El Toro Water District
City of Aliso Viejo	Irvine Ranch Water District
City of Dana Point	Laguna Beach County Water District
City of Laguna Beach	Moulton Niguel Water District
City of Laguna Hills	Municipal Water District of Orange County
City of Laguna Niguel	Natural Resources Conservation Service
City of Laguna Woods	Orange County Flood Control District
City of Lake Forest	Orange County Health Care Agency
City of Mission Viejo	San Juan Basin Authority
City of Rancho Santa Margarita	Santa Margarita Water District
City of San Clemente	South Coast Water District
City of San Juan Capistrano	South Orange County Wastewater Authority
County of Orange	Trabuco Canyon Water District

1.2.1 Agencies and Responsibilities

The South Orange County IRWM Group provides a framework for coordinating planning activities and projects related to water management and watershed protection that have been studied and funded, or are in need of funding, and integrating them into a water management plan with multiple regional benefits. This framework and regional management strategy will also maximize options for funding opportunities as they become available.

The South Orange County IRWM Plan is in accordance with the IRWM Plan Standards as set forth by the State Water Resources Control Board (SWRCB) and the California Department of Water Resources (DWR). The IRWM Plan incorporates existing regional planning documents including watershed management plans, integrated resource plans, urban water management plans, a groundwater management plan, a drainage area management plan, and other plans.

Appendix D includes brief descriptions of water/wastewater and other agency service areas within the Region, and responsibilities toward plan implementation.

1.3 IRWM Plan Planning Process

The County of Orange, South Orange County cities, and the special districts that serve their water and wastewater needs, have worked individually and collaboratively over the years to develop and integrate regional strategies that address, raise community awareness and coordinate numerous and varied projects that do the following:

- Protect communities from drought
- Enhance local water supply and system reliability
- Ensure continued water security
- Optimize watershed and coastal resources
- Improve water quality throughout the watersheds
- Safeguard habitat

The IRWM Plan has been developed from and coordinates with existing plans and research documents provided by the participating agencies in a manner that identifies and integrates regional projects to improve water supply and quality. The Plan establishes a priority ranking to help further regional efforts to investigate the feasibility of, and identify funding for, these projects. Individual projects however, will go through the appropriate environmental review and permitting process as funding is secured.

In August 2004, the County of Orange, cities and special districts within Region 9 – San Diego Regional Water Quality Control Board’s jurisdiction formed the South Orange County IRWM Group (IRWM Group) to continue this collaborative effort and to more efficiently coordinate their efforts through the development of an IRWM Plan. Section 1.3.1, Stakeholder Involvement, discusses the planning process for development of the IRWM Plan.

1.3.1 Stakeholder Involvement

Initial Planning Meetings

On August 24, 2004, the first meeting of the IRWM Group was held. This meeting included multiple stakeholders in South Orange County, attended by the County of Orange, cities, water purveyors, and wastewater agencies. The IRWM Group identified preliminary goals, objectives, and priorities for meeting the water supply and quality needs of South Orange County, and set a schedule for continuing meetings.

Meetings were held at least twice a month through the development of the IRWM Plan, beginning September 13, 2004. The IRWM Group continued to inform and invite additional stakeholders to the IRWM Group meetings, and the IRWM Group grew to represent nearly 30 entities. The stakeholders represent agencies and organizations that developed an integrated approach to addressing the objectives and water management strategies of the IRWM Plan. Significant progress was made to identify the myriad of projects that have been included in existing plans and incorporating those projects into the IRWM Plan.

As the IRWM Plan was being developed, numerous iterations of the Draft IRWM Plan were made available to the IRWM Group for review and comment. Comments were received, reviewed and discussed by multiple participants of the IRWM Group prior to incorporation into the Final IRWM Plan.

Initial Public Information Meeting

An initial Community Information Meeting was held on February 16, 2005 at the Santa Margarita Water District in Rancho Santa Margarita to inform the public and area stakeholders of the progress of and obtain comments on the Draft IRWM Plan. Press releases announcing the meeting were published in the Laguna Niguel News and the Aliso Viejo News on February 10, 2005. In addition, the meeting notice was e-mailed to nearly 500 individuals, including members of South County water quality and/or watershed task forces, environmental groups and other stakeholders. Our thanks to the following stakeholders that were in attendance:

- Amy Amirani, City of San Juan Capistrano
- Kathy Barnum, Kathy Barnum Associates
- David Belardes, Juaneno Band Mission Indians
- Richard Dietmeier, Public Stakeholder
- Michael Dunbar, South Coast Water District
- Dan Ferons, Santa Margarita Water District
- Mary Jane Foley, Consultant
- Pat Fuscoe, MiOcean
- Richard Gardner, South Coast Water District
- Michael Hazzard, Citizen Watershed Monitors
- Bob Hill, El Toro Water District
- Craig Justice, City of Laguna Beach
- Donna Krucki, Public Stakeholder

- Ed Labahn, Public Stakeholder
- Marielle Leeds, Orange County Coast Keeper
- Marcus Lenger, Hydrologix Systems
- Ziad Mazboudi, City of San Juan Capistrano
- Larry McKenney, County of Orange
- Cindy Montepagano, National Resource Conservation Service
- Robert Moore, South Coast Water District
- Cathy Nowak, County of Orange Harbors, Beaches & Parks
- Nancy Palmer, City of Laguna Niguel
- Bruce Posthumus, SDRWQCB
- Joanne Quirk, County of Orange Harbors, Beaches & Parks
- Wayne Rayfield, City of Dana Point
- John Schatz, Santa Margarita Water District
- Joe Soto, City of San Juan Capistrano
- Mark Tettermer, Irvine Ranch Water District
- Marilyn Thoms, County of Orange
- Michelle Tuchman, Municipal Water District of Orange County

The initial Community Information Meeting unveiled the Draft IRWM Plan, illustrating how the Plan was being developed to meet the requirements of the IRWM Plan Standards, while considering the unique nature and needs of South Orange County. The public was given twenty-one (21) days to respond with comments. Hard copies of the Draft Plan were distributed at the meeting and it was also posted on the County's Website at www.ocwatersheds.com. Only three sets of comments were submitted, which were incorporated into the Final Plan as appropriate.

A second Community Information Meeting was held May 31, 2005 again at the Santa Margarita Water District in Rancho Santa Margarita to share the Final Draft IRWM Plan with the public and area stakeholders. Press releases announcing the meeting were again distributed to local newspapers. A meeting notice was also e-mailed to the original 500 individuals included in the first Community Information Meeting, including members of South County water quality and/or watershed task forces, environmental groups and other stakeholders.

Disadvantaged Communities Participation in the Planning Process

South Orange County is home to the State and Federally recognized Juaneno Band of Mission Indians and a large Hispanic population. Each of these populations includes large communities of disadvantaged residents, and they had representation at the initial Information Meeting. Written Letters of Support for the IRWM Plan have been received from each of these communities and are included in Appendix E.

Public Information Efforts by Stakeholders, and Informational Presentations to City Councils and Board of Directors

A PowerPoint presentation was developed for IRWM Group participants to use in educating their individual City Councils and Board of Directors. In addition, a Fact Sheet was

developed and distributed to each participating stakeholder for use in informing their boards, councils, constituents and customers on the efforts of the IRWM Group. The Fact Sheet explained that a diverse group of water, wastewater, and watershed agencies and professionals had come together as a single unit to create stronger regional partnerships and connectivity, to maximize the efficiency of their efforts, and to develop a South Orange County IRWM Plan.

Mr. Larry McKenney of the County of Orange, conducted presentations to the following agencies throughout the IRWM Plan development process:

- El Toro Water District Board of Directors
- Joint Planning Committee of the Municipal Water District of Orange County and the Orange County Water District
- Orange County Board of Supervisors
- Orange County Business Council
- Regional Water Quality Control Board – Region 9
- South Orange County Wastewater Authority Board of Directors
- Water Advisory Committee of Orange County

The following stakeholder agencies took additional actions to inform their Boards/Council and the public:

City of Dana Point:

Jan/Feb, 2004 City Website: Advertised the February 16, 2005 Plan Information Meeting for the IRWM Plan on City's Website.

City of Laguna Beach:

November 16, 2004 Report to City Council: Participation in South Orange County Integrated Regional Water Management Group and Application for Proposition 50 Grant Funds. Received approval to submit projects identified in the report for inclusion in the South Orange County IRWM Plan

City of Laguna Niguel:

February 1, 2005 Report to City Council: Report on Status of South Orange County Integrated Regional Water Management Plan and Application for Proposition 50 Grant Funds

June 7, 2005 City Council Action: Council acceptance of IRWM Plan

City of San Clemente:

January 18, 2005 Report to City Council: Participation in South Orange County Integrated Regional Water Management Group and Application for Proposition 50 Grant Funds

City of San Juan Capistrano:

- March 1, 2005 Report to City Manager: Report on Status of South Orange County Integrated Regional Water Management Plan and Projects for Applications for Proposition 50 Grant Funds
- January 25, 2005 Report to Water Advisory Commission: Participation in South Orange County Integrated Regional Water Management Group and Introduction of Projects for Application for Proposition 50 Grant Funds

El Toro Water District:

- March 3, 2005 Community Advisory Group (CAG) Meeting: Report by General Manager, Bob Hill, on Development of the South Orange County Integrated Regional Water Management Plan, Project Prioritization, and Project Funding. CAG meetings are held for the purpose of communicating with District customer's key issues and projects taking place within the water industry and to answer questions and receive feedback.
- January 27, 2005 Report to Board of Directors: Status of Development of the South Orange County Integrated Regional Water Management Plan, and County of Orange Offer to Provide a Presentation to the District Board of Directors
- December 23, 2004 Report to Board of Directors: Status of Development of the South Orange County Integrated Regional Water Management Plan
- November 23, 2004 Report to Board of Directors: Status of Development of the South Orange County Integrated Regional Water Management Plan, ETWD Projects Included, and Schedule for Completion
- October 28, 2004 Report to Board of Directors: Status of Stakeholder Organization for Development of the South Orange County Integrated Regional Water Management Plan, Related Grant Funding, Plan Development Schedule, and Written Summary of the IRWM Group and Plan Development for the Board and Public

Municipal Water District of Orange County:

- June 15, 2005 Scheduled Acceptance of IRWM Plan by Municipal Water District of Orange County Board of Directors
- May 12, 2005 Regional UWMP Public Meeting: Noticed and held a public meeting to introduce and discuss the update of the Regional 2005 Urban Water Management Plan, and how it links with the South Orange County IRWM Plan.
- April 27, 2005 Larry McKenney Presentation to the Joint Planning Committee from MWDOC and Orange County Water District Regarding Urban Runoff Issues and Progress on the IRWMP Process in South Orange County

February 9, 2005 Status Report to MWDOC's Planning & Operations Committee
December 6, 2004 Status Report to MWDOC's Planning & Operations Committee
November 1, 2004 Status Report to MWDOC's Planning & Operations Committee

Moulton Niguel Water District:

February 15, 2005 Report to Engineering Board of Directors: Introduction Presentation the Development and Status of the South Orange County Integrated Regional Water Management Plan
May 17, 2005 Report to Engineering Board of Directors on the status of the development of the IRWM Plan.

Santa Margarita Water District:

March 18, 2005 Report to Board of Directors, Finance Committee: Status Report on IRWM Plan Development and Relation to Proposition 50 Grant Funding
December 3, 2004 Report to Board of Directors, Engineering Committee: Status Report on State Funding for District Projects – IRWM Plan Development
November 5, 2004 Report to Board of Directors, Engineering Committee: Proposition 50 Current and Anticipated Funding Programs; Status of IRWM Plan Development and SMWD Projects being Considered for the Plan

South Orange County Wastewater Authority:

June 2, 2005 Board of Directors Approval of IRWM Plan
February 3, 2005 Report to Board of Directors:
1) General Manager's Report
2) Presentation by County of Orange Manager of Watershed and Coastal Resources Division on the Status of the South Orange County Integrated Regional Water Management Plan
December 7, 2004 Report to Board of Directors: Status Report on the South Orange County Integrated Regional Water Management Plan, IRWM Plan Fact Sheet, and SOCWA Project Proposals
October 7, 2004 Report to Board of Directors: Information on Development of a South Orange County Integrated Regional Water Management Plan, Funding Sources for Plan Implementation, and Proposed Projects

Letters of Support from Non-Agency Stakeholders

Letters of support from non-agency stakeholders were received, and are included in Appendix E. Letters have been received from the following organizations:

- » Orange County Business Council, January 13, 2005, Terry Hartman, Chair, Infrastructure Committee; July Puentes, Executive VP Public Affairs. Supports collaborative effort for water reliability in the Region.

- » MIOCEAN, March 4, 2005, Patrick R. Fusco, P.E., Chairman. Supports IRWM Group organization to prioritize and effectuate implementation of projects in the Region.
- » Juaneno Band of Mission Indians, June 23, 2005, David Belardes, Chief and Chairman. Supports the projects proposed by the South Orange County IRWM Group.
- » National Hispanic Environmental Council, July 5, 2005, Oscar Gonzales, Southern California Coordinator, NHEC. Supports the numerous projects that will significantly benefit the disenfranchised communities in the region, particularly the Latino community.

1.3.2 IRWM Plan Adoption/Acceptance/Approval

The IRWM Group identified the lead agency as the County of Orange. Additionally, the Group identified the Municipal Water District of Orange County and the South Orange County Wastewater Authority as providing significant resources and leadership in South Orange County water and wastewater management. Therefore, the Board of Directors for each of these three agencies has accepted, approved or adopted the IRWM Plan by resolution. The following resolutions are included in Appendix F:

- County of Orange, Board of Supervisors Acceptance, June 7, 2005, Resolution No. 05-143
- Municipal Water District of Orange County, Board of Directors Adoption, June 15, 2005, Resolution No. 1768
- South Orange County Wastewater Authority, Board of Directors Adoption, June 2, 2005, Resolution No. 2005-07

Additional resolutions and letters by IRWM Group members accepting, approving, supporting or adopting the IRWM Plan are also included in Appendix F and include the following:

- City of Aliso Viejo, City Council Acceptance, June 1, 2005, Resolution No. 2005-035
- City of Dana Point, City Council Acceptance, June 8, 2005, Resolution No. 05-06-08-03
- City of Laguna Beach, City Council Acceptance, June 21, 2005, Resolution No. 05.054
- City of Laguna Hills, City Council Supporting, June, 14 2005, Resolution No. 2005-06-14-2
- City of Laguna Niguel, City Council Acceptance, June 7, 2005, Resolution No. 2005-811
- City of Laguna Woods, City Council Acceptance, June 15, 2005, Resolution No. 05-09
- City of Lake Forest, Letter of Support signed by Robert L. Woodings, Director of Public Works/City Engineer, July 12, 2005.

- City of Mission Viejo, City Council Acceptance, June 6, 2005, Resolution No. 05-57
- City of Rancho Santa Margarita, City Council Supporting, June, 22, 2005, Resolution No. 05-06-22-02
- City of San Clemente, City Council Acceptance, June 21, 2005. Resolution No. 05-42
- City of San Juan Capistrano, City Council Adoption, July 5, 2005, Resolution No. 05-06-21-01
- El Toro Water District, Board of Directors Adoption, June 23, 2005, Resolution No. 05-6-3
- Moulton Niguel Water District, Board of Directors Acceptance, June 16, 2005, Resolution No. 05-05
- San Juan Basin Authority, Board of Directors Adoption, June 21, 2005, Resolution No. 05-06-01.
- Santa Margarita Water District, Board of Directors Adoption, May 25, 2005, Resolution No. 05-05-07
- South Coast Water District, Board of Directors Adoption, June 21, 2005, Resolution No. 19-04/05
- Trabuco Canyon Water District, Board of Directors Adoption, June 15, 2005, Resolution No. 2005-1045

1.3.3 Established Partnerships

Multiple agencies within the Region have established partnerships for many years to develop both individual and regional projects. Within the IRWM Plan, many projects include partners among agencies to collaborate for regional benefits, linkages, and environmental justice. Additionally, regional programs have been established that include partnerships within multiple projects to provide broad regional benefits, while maximizing resources. The IRWM Plan has been developed as a partnership among nearly 30 South Orange County cities, water, wastewater agencies and the County of Orange. These agencies are described in Appendix C and Appendix D.

IRWM Plan projects, including project partnerships, are more fully discussed in Chapter 4, Implementation Priorities, Projects and Programs. One project partner that is not a direct participant in the IRWM Group is the Irvine Ranch Water District (IRWD). Several IRWM Plan projects incorporate IRWD's service area, which is also described in Appendix H.

Notably, Team Arundo was formed during the IRWM planning process. An offshoot of the IRWM Group, membership includes the County, cities, developers, regulators, nonprofit organizations, and public stakeholders. Arundo is a highly invasive weedy bamboo that can overwhelm fresh water riparian habitat areas. The mission of Team Arundo is to develop an Arundo Removal Plan in preparation of funding for implementation. Team Arundo will continue to meet, seek funds, and implement measures to remove Arundo as long as it is present within South Orange County.

1.3.4 Process for Plan Implementation

As discussed earlier, participants of the IRWM Group have worked individually and collaboratively over the years to develop and integrate regional strategies that address, raise community awareness and coordinate numerous and varied water management projects. Many of the projects within this plan are being planned collaboratively and will continue in this effort.

The IRWM Group will continue to meet regularly, no less than quarterly, to discuss the IRWM Plan implementation, collaborative opportunities, status on existing projects, proposals for new projects that meet the objectives and strategies of the IRWM Plan, available resources, and need for plan refinement. Planning reports, position papers, meeting minutes and policy statements combined with the strength of the IRWM Plan will be used to forward the objectives and strategies identified within this Plan.

Stakeholder involvement has been embraced throughout the IRWM planning process and will continue to be essential through the implementation process. Key stakeholder groups will be invited to participate in implementing the IRWM Plan resulting from the extensive outreach, coalition building, and visioning exercises that occurred during the planning process. With this information, the IRWM Group will be able to quickly focus on common goals and work with stakeholder groups to address priorities and potential conflicts. This outreach will help to ensure the IRWM Plan recognizes and documents the years of planning work for the included watersheds, and brings together all the research, ideas, and plans into one planning source.

Special attention has been given to facilitating involvement and input from minority communities and stakeholders, and addressing environmental justice remedies in the Region.

The IRWM Plan has the potential to offer real benefits to the communities it serves. Members of the Indian Council and Hispanic Community Group will serve on the Public Advisory Committee for IRWM Plan implementation. One member will be asked to represent the environmental justice needs of the Region.

Cooperation among IRWM Group members and other stakeholders for the development of the IRWM Plan has been exceptional. Plan implementation is anticipated to experience the same level of cooperation throughout the IRWM Group and stakeholders; thus, limiting the obstacles to implementation. Nevertheless, impediments may arise. Certain activities such as CEQA requirements, permitting, and funding could potentially impede timely Plan implementation. Each obstacle will be handled and managed through appropriate measures to lead to Plan success.

1.3.5 Coordination with State/Federal Agencies

Participants of the IRWM Group met with RWQCB (Regions 8 and 9), SWRCB and DWR staff throughout the planning process of the IRWM Plan. Local and Sacramento meetings were held to discuss planning efforts including coordination of IRWM Plan development, objectives, strategies, project prioritization and implementation.

In addition, the South Orange County IRWM Plan and planning process was presented to the RWQCB Region 9 at their May 11, 2005 meeting in Laguna Beach, California. Further, the IRWM Group presented at the Southern California Water Dialogue May 25, 2005 meeting at the Metropolitan Water District of Southern California as part of a larger presentation of all IRWM Plan efforts underway in Southern California. The Southern California Water Dialogue meets voluntarily to explore water-related issues of vital interest to our region. The Dialogue serves as a clearinghouse and advocate for projects, activities, and processes that will improve the quality and reliability of Southern California's water supply and benefit the California Bay-Delta Authority.

The IRWM Group desires to ensure a collaborative approach with State and Federal regulatory and planning agencies. Through this collaborative and informative process, the IRWM Plan has received tremendous input, support and praise.

Implementation of the IRWM Plan will also utilize a collaborative approach with State and/or Federal agencies. A number of the regional and local plans and proposed projects have been prepared by or in coordination with agencies such as the U.S. Army Corps of Engineers, California Department of Fish and Game, the Coastal Commission, and others. Implementation of Plan components and projects will incorporate these and other State and Federal agencies as determined appropriate for regulatory requirements, cooperation for collaborative projects, and communication among project proponents. The IRWM Group will continue to involve State and Federal agencies in planning meetings, implementation strategies, and actions to carry out projects.

CHAPTER 2 IRWM PLAN OBJECTIVES

2.1 Objectives

The IRWM Plan primarily focuses on the projects and plans of the member agencies, with an emphasis on water supply and water quality. The key challenges facing South Orange County are reflected in each of the individual member agencies, with a focus on the following:

- Water Reliability
- Seasonal Storage
- Water Quality
- Water Recycling
- Watershed Management
- Environmental Protection
- Grant/Agency Funding

Long-term regional planning includes identification of enhanced local water supplies to offset reduction of imported water to meet demands during times of drought. Though many projects are planned over the next 10 to 20 years to help achieve this goal, much more long-term planning, as well as implementation of integrated projects in all categories included in this IRWM Plan, is necessary to reach that goal.

Identifying the long-term water supply and water quality issues facing the Region over the next 20 to 50 years enables the South Orange County agencies to more effectively plan for the projects necessary to meet these challenges. All project categories within this plan are essential to maximizing limited water resources, protecting water quality, and enhancing the environment. This integrated approach allows regional agencies to access available resources, diversifying water supply sources over a broad range of projects.

In order to address the major water challenges within the region, key objectives were compiled in the following categories:

1. Water Supply (WS)
2. Groundwater Management (GM)
3. Aquatic Ecosystems and Watershed Management (AE)
4. Water Conservation (WC)
5. Water Quality (WQ)
6. Sewage and Flood Management (SF)
7. Information Management (IF)

Where appropriate at the conceptual level of detail, objectives are described below quantitatively. For some objectives, quantifiable goals are more appropriately developed at the detailed strategic and/or project levels, as described in Chapters 3 and 4. Following each set of objectives is a discussion of management measures being implemented or planned to meet the respective objectives.

2.1.1 Water Supply Objectives (WS)

- Objective WS-1:** Diversify the mix of water supplies to meet South Orange County's needs. This can be accomplished via water use efficiency efforts (see Section 3.3.4), developing local sources such as recycled water, groundwater and ocean water. In 2005, local sources including water conservation accounted for about 19% of supplies; by 2030 local resources are estimated to supply about 30% of total supplies. Total demands are projected to increase by about 36,000 AF, while imported water sources are projected to decrease by 17,000 AF. Imported sources will continue to provide the predominate source of water, and therefore the region must continue to work with MWDOC and Metropolitan to ensure the continued reliability of the import supplies.
- Objective WS-2:** Improve South Orange County system reliability to enable the local agencies to provide sufficient water supplies to their customers during both planned and unplanned emergency outages of the import water system. This will be accomplished by developing storage, local resources and interconnections with other agencies or regions of the County to be able to continue meeting customers demands without the benefit of the imported water system for a minimum of 7 days at average demands by 2010 and increasing the ability to meet customer demands without benefit of the imported system to 20 days at peak summer demands by 2020.
- Objective WS-3:** Reduce the vulnerability of water supply systems to droughts.
- Objective WS-4:** Ensure that appropriate levels of investments are made to meet water supply, water system and water quality objectives. Over investment or under investment are inappropriate strategies for the South County Region. Water supply costs and retail rates will be developed to reward good water stewards and penalize water wasters.

Water Supply Development

South Orange County's water communities are facing increasing challenges in their role as stewards of the region's water resources. As population continues to increase, the Region requires additional investments to continue providing adequate quantities of high quality water for its customers. Water planning and development is required to continue on a statewide, regional, and local level as competition for water from outside the Region in areas such as Northern California and the Colorado River requires us to be ever more vigilant in protecting our resources and developing local resources to help meet our needs. Furthermore, environmental awareness and consideration for the natural processes vital to the Region have become influential features of comprehensive water planning.

A primary goal of the IRWM Plan is to present and discuss all water systems in a comprehensive and inclusive manner that indicates a regional understanding of the importance of an integrated planning approach. The continued development of projects and plans to pursue such a goal is vital to the economic and environmental health of the region. It is expected that this document will be updated as appropriate, and understood that as the Region advances, efforts to improve water supply, quality and reliability will expand. In this chapter, long-term regional planning is outlined with current information, though these strategies will continue to improve and develop over time.

The IRWM Plan lists a variety of projects, including infrastructure improvements, desalting and recycling projects, and water use efficiency programs that are planned for South Orange County. These projects are effective tools to generate not only drought year water supply, but “regular year” water supply as well. By cleansing tainted groundwater supplies or recycling wastewater, previously unusable sources of supply are available to meet water demands. While these new water supplies may not contribute directly to long-term storage, they help reduce reliance on imported water. For these reasons, more types of processing and storage facilities are needed to improve both system and supply reliability. Other planned projects, such as stormwater capture facilities, contribute directly to both short-term and long-term storage. Diversion of floodwaters to recharge basins or to storage for reuse will mitigate the dangerous characteristics of flooding as well as augment the available water supply. Watershed planning, including invasive species removal and other habitat restoration projects will enhance water quality and ecosystem vigor.

Imported Water Reliability

Watershed Water Supply and System Reliability Efforts by MWDOC

Approximately 94% of the watershed’s potable water supply is imported from Northern California and the Colorado River. This water is treated over 40 miles away at the Diemer Filtration Plant in Yorba Linda and delivered via two aging pipelines, the East Orange County Feeder No. 2 and Allen McColloch Pipeline. To ensure continued water reliability for south Orange County, 11 Orange County agencies, the Metropolitan Water District of Southern California (Metropolitan) and the U.S. Bureau of Reclamation joined together to fund the South Orange County Water Reliability Study (SOCWRS) - Phase 2 System Reliability Plan. System Reliability refers to having the facilities and flexibility to continue meeting consumer’s demands during relatively Short-term emergency outages of key facilities (7 to 30 days or so). Supply Reliability refers to being able to provide water under long-term drought or water shortage situations (over periods of years). Heading these efforts was the Municipal Water District of Orange County (MWDOC). The study area for the reliability evaluations is the same as for the IRWM Plan area. Funding and implementation of the projects is being pursued in a number of ways, including local participation, to support these critical water reliability projects.

MWDOC’s purpose in studying the system reliability issues were to:

- Identify risks, including earthquakes, that pose the greatest threat to the regional water treatment and distribution infrastructure that serves the project area

- Identify ways to bolster source-of-supply and regional distribution systems, building on earlier engineering investigations and studies
- Develop a list of projects that accomplish the above objectives, and identify appropriate investments
- Allow for flexibility in phasing. Most notably project operational dates and sizing should be flexible to account for changes in local resource development through construction of Local Resources Projects (LRPs).
- Develop and implement projects to improve system reliability. The planning work took into consideration a number of prior studies, including: SOCWRS Phase 1, which served as the foundation for this effort; Metropolitan's Central Pool Augmentation Project, currently in project and right-of-way refinement; Santa Margarita Water District's Lined and Covered Reservoir investigations to increase local storage for emergency needs; Irvine Ranch Water District's Water Resources Master Plan Update and Planning Area-6 Sub-Area Master Plan; and various Orange County Water District plans and groundwater basin operations studies.

To determine the economic impacts of water shortages, MWDOC retained the services of the Orange County Business Council. A separate report was prepared and the results are summarized later in this document. The economic impacts were found to range up to \$1.7 billion, depending on shortage scenario. Even a relatively short 10-day outage of 20% carries a projected impact of over \$60 million. These numbers illustrate the tremendous potential cost to the watershed from water system outages. Longer-term drought impacts were also evaluated in the analysis and resulted in even larger impacts.

Planning Principles

Key planning principles used to guide the formulation of alternatives and the Plan are:

- Develop priorities for accommodating Metropolitan planned shutdowns of 7 days of average demand and for emergency outages of up to 31 days of summer demand.
- Evaluate compatibility of project components with existing and future supply needs, with preference for projects providing multiple purposes, and seeking economies of scale through regional joint use facilities.
- Make better use of existing, underutilized infrastructure assets.
- Identify Metropolitan system investments that can provide for flexibility in system operation and to maintain and improve system capability and reliability for Orange County.
- Select appropriate projects that can be phased and modified to changing conditions.

Watershed Water Supply Risks and Scenarios

An emergency outage of the Diemer Filtration Plant, which is situated adjacent to the Whittier Fault, is judged to be the most severe supply risk to the watershed. In addition, there

are scheduled and sometimes urgent shutdowns of critical facilities that are necessary to make repairs and improvements.

One of these critical facilities, the Allen McColloch Pipeline, has experienced one major failure and two minor leaks since its construction in 1980 as well as having been shutdown at various times for inspection and repairs. The major failure occurred in December 1999 due to a pressure surge, and was repaired and restored to service in seven days by MET construction crews.

Finally, the East Orange County Feeder No. 2, a Metropolitan-operated pipeline, is considered to be in good condition, but it is aging, having been constructed in 1963. An outage of this pipeline has a smaller impact in south Orange County since the Allen McColloch Pipeline and South County Pipeline, the major extension of the Allen McColloch Pipeline into south Orange County, provides about 50% greater capacity than the East Orange County Feeder No. 2.

There are several faults in the area that could cause earthquake-induced failures. Of most significance is the Whittier-Elsinore Fault Zone and, to a lesser extent, the Peralta Hills Fault, San Joaquin Hills Thrust Fault, and the Newport-Inglewood Fault Zone. Knowledge of seismic forces has advanced significantly since the design and construction of the Orange County regional water treatment and distribution system, as well as design standards for protection of structures from major earthquakes.

The scenarios evaluated included Metropolitan planned shutdowns of the Diemer Filtration Plant, either a lower or upper Allen McColloch Pipeline emergency outage, and a Diemer Filtration Plant emergency outage. For the latter, the evaluation included sub-cases with and without implementation of the Central Pool Augmentation (CPA) Project by Metropolitan. The CPA Project has the greatest positive impact on the ability of south Orange County to withstand outages; however, its implementation is years away.

The scenarios were also evaluated with and without planned Local Resources Projects (LRPs). These projects, such as water recycling and groundwater desalters, reduce the extent of shortages, and therefore the number and size of reliability improvements that area required. The more local projects that can be developed help to provide improved reliability in the Region.

Estimated Shortages by Planning Scenario

Shortage estimates for planned shutdowns and emergency outages were determined and are summarized in Table 2.1.1-1. For planned shutdowns, under average demand conditions, a 7-day shutdown of all Metropolitan facilities serving south Orange County would result in a deficiency of 80 to 108 cfs in 2010 and 2025, respectively. To mitigate this shortage, between 950 and 1,500 AF of new storage or equivalent supply is needed. Under a Diemer Filtration Plant shutdown, needs are reduced to 59 cfs in 2010 with the use of other available supplies (Orange County Feeder, Baker Aqueduct and San Juan Capistrano's groundwater desalter (first phase in operation)).

For emergency outages, an array of shortage scenarios were reviewed, focusing on 10-day outages of the East Orange County Feeder No. 2, 10 to 31-day outages of the Allen McColloch Pipeline, and a 31-day outage of the Diemer Filtration Plant. The analysis bracketed the range of LRP implementation, from 0% to 100%.

Study results indicate that the most significant risks facing the watershed are outages of the Allen McColloch Pipeline and Diemer Filtration Plant. For these cases, shortage ranged from approximately 110 to 240 cfs. Placing these numbers in perspective, shortages for a summer outage in 2025 would range up to 86% of potable demand for a 31-day outage of the Diemer Filtration Plant.

The shortages evaluated assume meeting consumer demands. In times of emergency outages and inadequate supply, a necessary response can include demand curtailment. However, these types of actions come with economic and quality-of-life impacts and should not be considered a substitute for reliability improvements, since actual shortages may be longer in duration than those studied or be exacerbated by multiple failures.

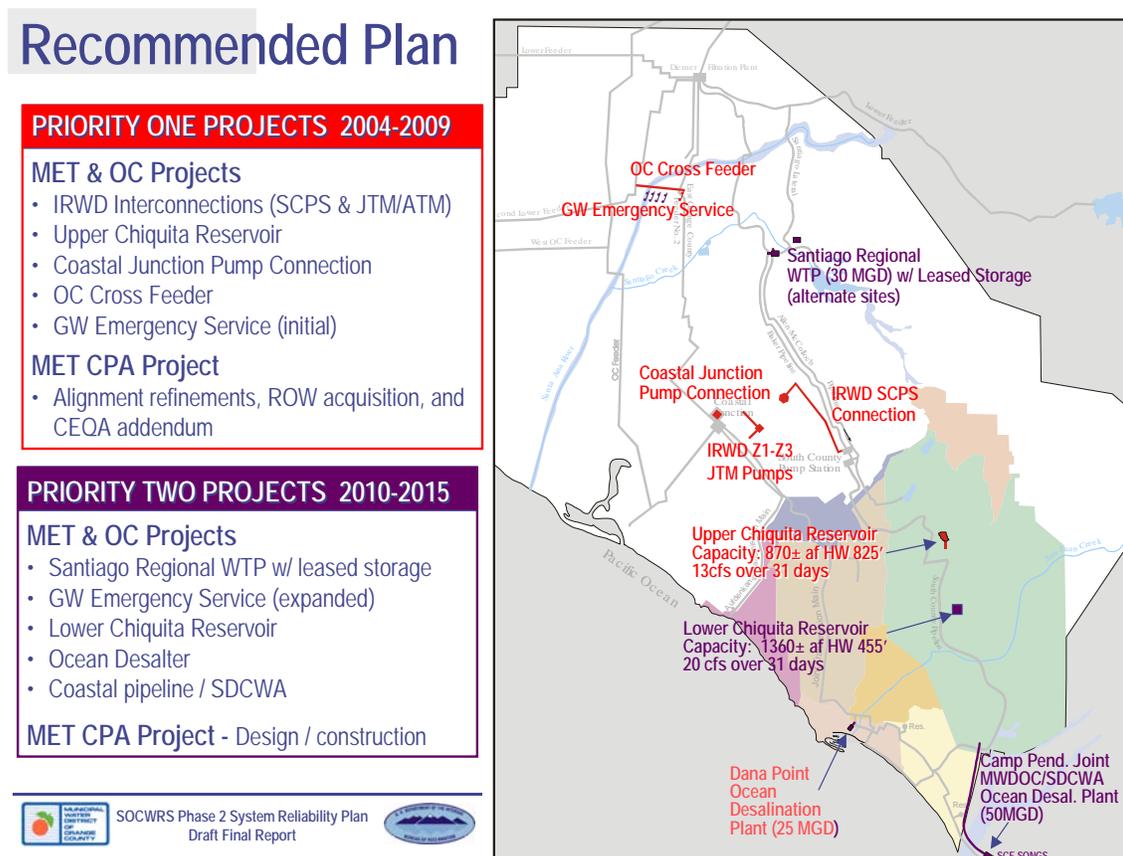
Table 2.1.1-1 Supply Shortages due to Planned Shutdowns and Emergency Outages				
Facility	Planned Shutdowns 2010 Average Demand		Emergency Outages 2025 Summer Demand	
	100% LRPs	0% LRPs	100% LRPs	0% LRPs
Diemer Filtration Plant				
7-Day Shutdown			189 cfs	243 cfs
Shortage Rate	59 cfs ^[1]		11,640 af	14,900 af
Equivalent Storage	818 af		80%	86%
Percent of Demand				
Allen McColloch Pipeline				
10-Day Outage			52 cfs	111 cfs
Shortage Rate			1,023 af	2,209 af
Equivalent Storage			19%	35%
Percent of Demand				
31-Day Outage			63 cfs	116 cfs
Shortage Rate			3,854 af	7,119 af
Equivalent Storage			26%	41%
Percent of Demand				
East Orange County Feeder #2				
10-Day Outage			0	36 cfs
Shortage Rate			0	722 af
Equivalent Storage			0	11%
Percent of Demand				

* LRP's = Local Resources Projects planned for implementation by the local agencies

Projects Recommended for Implementation

The projects recommended for implementation fall into three categories and are the building blocks of the Base Plan and the Contingency Plan: (1) regional distribution system, (2) storage/treatment and (3) ocean desalination. The recommended projects are Base Plan or Priority 1 projects as outlined in the Figure 7 that are expected to minimize shortages and assume 100% of the LRPs are implemented. If fewer LRPs were implemented, then additional Contingency Plan or priority 2 projects would be necessary.

**Figure 7
South Orange County Water Reliability Study – Phase 2 System Reliability Plan – Recommended Plan**



Implementation Phase for South Orange County System Reliability Projects

MWDOC has been working with the South Orange County water agencies to implement a variety of projects identified in the study work to improve system reliability. These projects are discussed below:

1. IRWD Interconnections

The concept involves making improvements to the IRWD system to enable water to be moved through the IRWD system and into South Orange County. Two issues have been analyzed, the first being the IRWD system conveyance capacity to move the water and the second being the source of water to move into South Orange County.

Potential points of connection for delivery include having the ability to move water to South Orange County under either of the two scenarios:

With EOCF#2 Outage

- Pump from the IRWD Zone 3 to the Joint Regional Transmission Main (JRTM) and flow from IRWD Zone 3 to the Aufdenkamp Transmission Main (ATM).

With AMP Outage

- Boost water across the IRWD system for delivery of water to the South County Pump Station, where it can be further boosted and delivered by Metropolitan.

Based on modeling work completed by IRWD, it appears that IRWD can potentially deliver 50 cfs or more through their system while meeting IRWD maximum month demands (considering only IRWD system conveyance capacity). The actual delivery capability will depend on the source of water (where it comes into the IRWD system) and supply capacity and the timing of system improvements to the IRWD system. The amount of capacity diminishes from a high of over 100 cfs to about 50 cfs in 2025 as demands build in the IRWD system. The following should be noted with respect to these projects. Fewer improvements are needed to deliver water into the EOCF#2. Considerably more improvements are needed to deliver water to the South County Pump Station. New local groundwater supply projects are being considered by IRWD.

Based on an analysis of existing IRWD local supplies and IRWD demands, it should be noted that locally developed groundwater supplies could be utilized during lower demand periods of the year when not needed within IRWD. These existing supplies currently total about 95 cfs and are planned for expansion in the next 5 to 10 years by about 18 cfs (Westside wells and Francis wells). IRWD almost always needs these supplies in the event of a Diemer outage during the hotter periods of the year. During a planned winter outage, 30 to 40 cfs may be available, but the amount declines over time to 20 to 30 cfs. In the event of an outage of only the AMP or only the EOCF#2, IRWD will likely have available supplies to share with South Orange County.

Other sources of water to move through the IRWD system into South Orange County includes MET supplies that are available through the Orange County Feeder into the 4th reach of the EOCF#2. This water can be taken by IRWD into their system and boosted to Zone 3. As much as 30 to 40 cfs of water may be available. The Groundwater Emergency Water Service Plan could add additional supply resources to this mix. It will be several years before these supplies might be available.

2. Upper and Lower Chiquita Reservoirs

MWDOC has been working with Santa Margarita Water District, lead agency, on the next implementation steps for these reservoir projects. To date efforts have centered on working with prospective South County water districts in determining participants and requested storage capacity. SMWD has retained geotechnical consultants to investigate the project sites and to develop preliminary engineering plans. SMWD is in the process of developing a participating agreement for the project.

3. Coastal Junction Pump Station

MWDOC is in the process of working with Metropolitan Water District in the design and specification of pump risers and electrical service to permit emergency generators to be used to pump water from the Orange County Feeder through Reach 4 back into the Joint Transmission Pipeline and/or Aufdenkamp Transmission Pipeline that serve South Orange County. This project would be able to pump about 20 cfs under emergency conditions.

4. Groundwater Emergency Service Program

Planning work is in progress on this program to provide emergency deliveries of groundwater to South Orange County under periods of outage of either the Diemer Treatment Plant and/or both the primary delivery pipelines. Policy discussions have been held with the Joint Planning Committee of the Orange County Water District and MWDOC Board of Directors. A working group of key agency managers has been established to develop policy principles and project concepts. The concept being considered would be either an investment in new local agency wells and connection to the EOCF#2 or into an OCWD coastal pumping shift wellhead that would deliver water from inland areas to coastal areas via the Metropolitan EOCF#2.

5. Orange County Cross-Connector

This project would connect the Second Lower Feeder with the EOCF#2 in Mira Loma Street in Anaheim to allow deliveries from the Jensen Treatment Plant into South Orange County during periods when the Diemer Treatment Plant is out-of-service for shutdowns, outages, or other reason or to accommodate increased deliveries of State Project water into South Orange County. This project is being proposed to be included in the FY06 Metropolitan capital investment program budget. Alignment studies have been completed by Metropolitan and a preferred alignment has been recommended. This project is planned to be on-line in 2008.

6. Ocean Desalination (Dana Point and Camp Pendleton)

The Dana Point Ocean Desalination Project is being investigated at this time to determine whether an ocean desalination plant can be successfully constructed and operated at the South Coast Water District site in Dana Point. Investigations at this time include determination of the adequacy of the underground alluvial formation to support a sufficient yield of seawater, determination of adequate brine disposal capacity in the

South Orange County Wastewater Authority (SOCWA) outfall, and evaluation of energy supply for the project.

The Phase I Hydrogeology Investigation fieldwork was completed in March 2005. Four boreholes were drilled in Doheny State Beach. Two of those boreholes were completed as nested monitoring wells near San Juan Creek in the North Day Use area. The monitoring wells were completed in the shallow aquifer, the main aquifer and the deeper zone. The shallow aquifer is in hydraulic continuity with the baseflow of San Juan Creek. Chemical as well as bacteriological sampling will be conducted quarterly at these two monitoring wells over the next year.

The Phase II Hydrogeology Investigation will be conducted during the winter of 2005/06. This work includes construction of a test slant well using Horizontal Directional Drilling (HDD) technology combined with installation of a pre-packed screen out under the ocean from near the monitoring well location. This work will determine the hydrogeology and water quality, as well as providing research and development information for full-scale HDD subsurface well intake system design and construction.

Other planning efforts underway by MWDOC include the following projects:

Central Pool Augmentation Project: MWDOC is working with Metropolitan at this time to further evaluate the timing and need for the project to provide additional treated water into the Central Pool Service Area portion of Metropolitan's system and further to fully understand the reliability implications this project would have for South Orange County. The Central Pool Augmentation Project involves construction of a new treatment plant at the Eagle Valley site in Riverside County near Lake Mathews and construction of a conveyance facility into South Orange County. Options for the conveyance include an 11-mile tunnel system through the Santa Ana Mountains and a northern pipeline alignment around the Santa Ana Mountains. The project timing is somewhat tenuous at this time and ranges between 2020 and 2030 for start-up, based on the need for treated water demands. Based on the need for system reliability, the project is needed to back-up South Orange County at this time. The project is estimated at around \$1.2 billion. Additional work on the tunnel and northern alignment are planned along with a revised timing analysis.

Metropolitan Infrastructure Reliability Protection Projects: Metropolitan is in the process of evaluating their distribution system and treatment plants to better understand their system reliability risks. MWDOC is supportive of these efforts. A major effort is being made to examine the seismic forces that could be exerted at the Diemer Plant from a movement of the Whittier fault to determine potential areas for improvement. An outage of the Diemer Filtration Plant is the most serious problem for Orange County.

Coastal Supply Line Connecting South Orange County to North San Diego County: Metropolitan, MWDOC and San Diego County Water Authority are working on a study effort to determine the potential benefits of linking the South Orange County distribution system with the North San Diego Distribution system with a pipeline across Camp Pendleton.

The study is recently began in April 2005 and is expected to be completed by the end of the 2005.

Surface Water Development

Limited surface water is available as a potable or non-potable source, as surface flow is required for riparian habitat preservation and key for groundwater recharge. Generally, the heaviest flows in regional watersheds occur primarily in the winter and spring with seasonal rains and snow melt. Groundwater basin recharge rates vary by the geological characteristics of each creek. Finer grained sediment at the bottom of a creek bed provides less opportunity for deep percolation. Therefore, the greatest opportunities for surface water development exist in the reduction and treatment of pollutants to improve water quality for both the affected habitats and groundwater basins. Projects such as Santa Margarita Water District's Gobernadora Basin and Trabuco Canyon Water District's Groundwater Treatment Plant are two of the proposed projects that illustrate the importance of comprehensive surface water development.

In the IRWM Plan, two creek diversion or water reuse projects are proposed, one at Oso Creek and the other at Aliso Creek. Both projects offer significant benefits to the watersheds by managing and improving the downstream flows to maintain the corridor habitats and to improve the quality of water to be percolated in addition to the harvesting of source water to augment regional supply.

Water Recycling

Water recycling has long been regarded as a cost-effective water supply alternative in Orange County. Recycled water in the County is used to irrigate crops, golf courses, parks, schools, business landscapes, residential lawns, and some industrial uses. Local water recycling projects involve the collection of wastewater that is currently being discharged within the service area, treating that water to a suitable standard for specific uses, and substituting the recycled water for existing or future potable water demands. The projections for expanded development of this type of water recycling are based upon several "institutional assumptions" that vary depending on the end use of the recycled water. Development of recycled water projects generally requires creative solutions to funding, regulatory requirements, institutional arrangements and public acceptance.²²

At a regional level, studies of water recycling opportunities within the southern California area provide a context for promoting the development of water recycling plans. The Southern California Comprehensive Water Reclamation and Reuse Study analyzed 15 geographical areas for short term project implementation, two of which were located in South Orange County. The 'Upper Oso' short term implementation plan, as described by the report, indicates a need for regional agencies to continue to expand and connect the recycled water distribution systems as a collaborative effort. These agencies would include Santa Margarita Water District, El Toro Water District, Moulton Niguel Water District, and South Orange

²² Municipal Water District of Orange County, 2000, *Regional Urban Water Management Plan Update*.

County Wastewater Authority. Sensitivity analyses for the ‘Upper Oso’ region demonstrated that this implementation plan would result in robust benefits remaining positive across a wide range of assumptions for estimated project costs or the avoided wastewater and water supply costs. The second region identified in the study was the ‘San Juan’ region, which includes the recycled water systems of the City of San Clemente, the City of San Juan Capistrano, the Santa Margarita Water District and the South Orange County Wastewater Authority. This region is also recommended to expand and connect the recycled water systems of the area to create a more reliable water supply. The net economic benefits are positive. However, there are issues that need resolution in the ‘San Juan’ region, including the equitable distribution of cost and flows from the Jay B. Latham Wastewater Treatment Plant, and the renovation of the facility itself, which is addressed in this Plan as a part of Chapter 4.

The Southern California Comprehensive Water Reclamation and Reuse Study also identified a long term strategy for the entirety of Orange County. The long term analysis in the Orange County region consisted of increasing reuse at six of the wastewater treatment facilities and one of the reservoirs in the area. This increased flow is expected to satisfy approximately 52,500 acre-feet per year of new demand by 2040, considered the maximum goal attainable, and is being used as a guideline for local reuse. The Orange County region Long-term strategy described in the report would also establish connections between the seven treatment facilities and reservoirs located in South Orange County to create one regional system.²³

Some regional funding for system improvements and expansions is available through the Metropolitan Water District, which provides rebates for the development of cost-effective water recycling and groundwater recovery projects that reduce the demand for imported water supply and improves regional water supply reliability. Metropolitan is currently participating with MWDOC on four projects in South Orange County. Those are the Moulton Niguel Water Reclamation Project, the Santa Margarita Water Reclamation Project, City of San Juan Capistrano Non-Domestic System, and the Trabuco Canyon Water Reclamation Expansion Project.

Recycled water use can also be increased by requiring dual piping in new developments, retrofitting existing landscaped areas, and constructing recycled water pumping stations and transmission mains to reach areas far from treatment plants. However, the additional costs, large energy requirements and new facility requirements make such projects very expensive to pursue. To optimize the use of recycled water, cost/benefit analysis must be conducted for each potential project. As previously discussed, the Southern California Comprehensive Water Reclamation and Reuse Study has shown that the net benefits are far greater than the direct costs.²⁴

²³ Department of Water Resources et. al., 2002, *Southern California Comprehensive Water Reclamation Study, Phase Two Final Report*.

²⁴ Municipal Water District of Orange County, 2000, *Regional Urban Water Management Plan Update*.

2.1.2 Groundwater Management Objectives (GM)

Objective GM-1: Balance groundwater pumping with increased recharge capabilities to fully utilize the storage capability of the groundwater basins in South Orange County. Over the planning period through 2030, it is expected that the recharge capability and pumping capability of the San Juan Basin will be increased by about 7,500 AF, beyond the current 2005 dependable yield capacity of 7,300 AF. It may be possible to increase the yield above this amount for additional dry-year yield with a plan for recharge and recovery of the basin. The existing operation of the basin will have to be monitored for several years with the San Juan Basin Project in operation to ensure that there will be no adverse effects.

Objective GM-2: Protect groundwater from contamination.

Groundwater Management

With the Region's dependence on imported water to serve water demands, the need for local storage intensifies. One of the most effective forms of storage in a dry and arid climate is conjunctive use, wherein water is stored underground during wet periods and pumped out during dry or drought periods. Limitations to such storage include available resources such as basin storage capacity, pumping capacity, recharge capacity, water quality and institutional constraints. Despite these challenges, conjunctive use storage is a far less expensive and non-intrusive alternative to surface water storage.

The total calculated storage capacity of the San Juan Creek Groundwater Basin is estimated to be 90,000 acre-feet. Some of the storage capacity cannot be used because of potential sea water intrusion, economic reasons, or poor water quality. The San Juan Basin is a shallow basin that has been categorized as an underground flowing stream which also limits storage capabilities.²⁵

Groundwater sources are highly desirable in terms of water quality, cost, utilization of local energy resources, and also contribute to the Region being less dependent on imported water supplies on an overall basis. However, they are subject to interruption during drought conditions that occur, therefore projects dedicated to recharge efforts and groundwater quality measures are of particular significance to the regional water supply. The groundwater within the lower San Juan Basin generally requires treatment for potable use.

Groundwater supply is being developed through the desalter project initiated by the City of San Juan Capistrano and the San Juan Basin Authority. The Phase I facilities were completed in December 2004, and the City of San Juan Capistrano is currently receiving 4,800 acre-feet

²⁵ Department of Water Resources, 1972, *Bulletin No. 104-7, Planned Utilization of Water Resources in the San Juan Creek Basin Area.*

per year of potable water from this supply. Completion of Phase II will increase the supply to at least 10,000 acre-feet per year. The South Coast Water District also anticipates completion of a groundwater recovery system to operate on the San Juan Creek Groundwater Basin in 2007. Initial production is expected to be 800 acre-feet per year, with potential to increase in the future.

Groundwater recharge of the San Juan Groundwater Basin occurs naturally at a rate of approximately 10,500 acre-feet per year.²⁶ However, as groundwater pumping programs develop, the natural rate of recharge will need to be monitored and augmented. Phase II of the San Juan Basin Authority desalter project includes recharge facilities. Completion of Phase II of the project will provide sufficient pumping and desalting capacity for short-term drought and emergency protection.

2.1.3 Water Conservation Objectives (WC)

Objective WC-1: Reduce water demand by 9,700 AF in 2005 increasing to more than 19,600 AF in 2030 through the implementation of Best Management Practices water use efficiency measures. The net increase due to Water Use Efficiency practices is expected at about 10,000 AF or more between 2005 and 2030.

Demand Management/Water Use Efficiency

Demand management consists of conservation programs and demand curtailment. It is a long-term means to extend the availability and reliability of existing supply. Curtailment or rationing is a viable option for short-term supply shortages, which may include limiting potable landscape meters during emergencies. However, the more important issue for long-term regional water supply is water use efficiency (WUE).

As signatories to the Memorandum of Understanding containing 14 Best Management Practices (BMPs) for urban water conservation in California, MWDOC and south Orange County water agencies are voluntarily committed to the implementation of all cost effective BMPs. Examples of BMP's include Home Water Surveys, Low-Flow Showerhead and Toilet Retrofits, Clothes washer Retrofits, Landscape Irrigation Budgets, Education, Public Information, Industrial Process Water Improvements and Water Waste Prohibitions.

Water agencies throughout the County have provided incentives for the installation of more than 350,000 Ultra-Low-Flush Toilets, which are saving more than 11,700 AF of water per year. In addition, more than 75 percent of the showerheads have been replaced with low-flow heads. As a result of these BMP implementation efforts, indoor residential water saving opportunities are nearly exhausted. Public Information, School Education, Conservation Pricing and metering with Commodity Rates are considered ongoing WUE efforts but area non-quantifiable in terms of water savings. Outdoor landscape irrigation water savings plumbing fixture retrofits in local businesses are the regions' next major areas of focus to

²⁶ Army Corps of Engineers, 2002, *San Juan Creek Watershed Management Study*.

achieve quantifiable water savings. These savings will be achieved through incentives to install weather-based irrigation timers, irrigation system distribution uniformity improvements, design changes including plant palette.

Orange County’s Residential Runoff Reduction Study documented significant water savings, runoff reduction and pollution prevention benefits from the installation of self-adjusting Weather Based Irrigation Timers in single-family homes and commercial landscapes. This study was the basis for the first regional implementation program in the State offering rebate incentives to customers to install up to 5,000 Weather Based Irrigation Timers.

If fully implemented in south Orange County, the maximum water savings potential associated with installation of these technologies in single-family homes and commercial landscapes is estimated at more than 13,500 acre-feet per year. As described in Chapter 4, MWDOC has proposed immediate expansion of the pilot rebate program designed to target approximately 30% or 4,862 acre-feet per year of the maximum savings potential.

Other WUE programs continue to be implemented by the individual water districts as well. Educational classes and literature are made available to consumers in each school district. Examples of programs include water conservation workshops for homeowners, rebate programs for installation of water saving technologies, and professional landscape training and certification classes. Future potable water use efficiency in South Orange County will reduce water demand and the level achieved will be the result of several factors, including program investments, consumer acceptance, advancements in technology, etc.

WUE is an effective and reliable component to reducing regional reliance on imported water as the population of south Orange County continues to grow. MWDOC estimates indicate that by the year 2030, water supplies made available through conservation efforts will total 19,264 acre-feet per year as illustrated in Table 2.1.3-1 below, an increase of about 10,000 AF over and above existing Water Use Efficiency levels achieved in 2005. More aggressive efforts could possibly save additional water.²⁷

**Table 2.1.3-1
Total Projected WUE / Water Conservation Projects and Water Savings (AFY)**

Type of WUE Project / Program	2005	2010	2015	2020	2025	2030
Active WUE	2,389	3,111	3,653	4,226	4,919	5,762
Passive WUE	7,301	8,943	10,255	11,331	12,529	13,862
Total WUE	9,700	12,054	13,908	15,557	17,448	19,624

Source: MWDOC, May 2005

²⁷ Municipal Water District of Orange County, 2004, *South Orange County Water Reliability Study Phase 2*.

2.1.4 Aquatic Ecosystems and Watershed Management Objectives (AE)

Objective AE-1: Optimize the healthy functioning of regional aquatic ecosystems.

Objective AE-2: Manage developed areas to minimize impacts on downstream aquatic ecosystems.

Watershed Management

Watersheds play an integral part of the regional water supply efforts, and function as a source of surface water and percolation sites for groundwater storage. Protection and promotion of healthy watershed ecosystems is a key component of the IRWM Plan. In addition to the many projects described in Chapter 4 that contribute to the improvement of the watersheds, the ongoing activities of stakeholder agencies and citizen groups continue to assist in the development of environmentally sound policies and projects.

Watershed management plans have been developed for the San Juan Creek Watershed and the Aliso Creek Watershed. The goals of these plans have been to identify feasible management options to address watershed problems in a variety of categories outlined by regional agencies and local constituents, as well as to reestablish a stable, healthy, and sustainable watershed environment. Watershed management frameworks and/or plans for the remaining watersheds are being pursued.

2.1.5 Water Quality Pollution Reduction Objectives (WQ)

Objective WQ-1: Protect the quality of surface and groundwaters, consistent with their beneficial uses.

Water Quality of Urban Runoff

Urban runoff is a priority concern for the Region. Pollutant pathways and cycles within diverse geographic settings, such as South Orange County can be complex. In general, pollutants are transported and sometimes transformed into other compounds with stormwater runoff. They are either in dissolved form, particulate form, or are absorbed by other particles in the water. Therefore, land use characteristics that promote infiltration and slow the flow of water allowing sediments to settle or filter out are important factors that control pollutant mobility. Additionally, promoting effective water conservation practices helps to reduce the amount of urban runoff.

Recent water quality data collected by the Orange County Health Care Agency and the County of Orange Resources and Development Management Department have indicated that elevated total suspended solids concentrations are strongly associated with runoff from winter storm events. Many of Southern Orange County beaches are continuously posted due to high levels of bacteria. Southern Orange County also faces challenges of existing and proposed TMDL's, restrictions regarding ASBS's and protection of CCA's.

Recent nutrient data from testing in the San Juan Creek shows an increase in nitrogen concentration with increasing antecedent rainfall. This suggests that non-stormwater runoff from urbanized areas could result in increased nitrogen concentrations. Phosphate data from San Juan Creek reveals an opposite trend from nitrate. Phosphate concentrations generally decrease between upstream (open space land use) and downstream (mixed land use). An explanation is based on the general trend that sediment loads are greater in storm runoff from vacant and agricultural land uses in comparison with those from urban land uses.

Dry weather and stormwater data collected by the County of Orange for trace metals in the San Juan Creek reveal consistently greater than average total metal concentrations during storm flow conditions. This is expected due to the affinity of metals to be absorbed by soil particles, which are present in greater quantities in storm runoff. For copper, total metal concentrations increase with greater levels of development. This is expected, as heavy metal concentrations generally increase with urbanization.²⁸

The 2003 Drainage Area Management Plan has been developed to implement the requirements of the stormwater discharge permits issued through the San Diego RWQCB. Stormwater BMPs for urban development and redevelopment are outlined, and programs for development provide a framework for incorporating watershed protection and stormwater quality principles. However, NPDES permit compliance is only an element of the regional goal of total watershed efficiency.

Impaired Waters

Under section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop a list of water quality limited segments. These waters do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water quality impairment on the list and develop action plans, referred to as Total Maximum Daily Loads (TMDL), to improve water quality. In South Orange County, the SWRCB and the Regional Board staff have evaluated each addition, deletion, and change to section 303(d) based on all the data and information available for each water body and pollutant.²⁹

In South Orange County, four portions of rivers or streams, five coastal shorelines and beaches, two estuaries, and one harbor in South Orange County were identified on the 2002 303(d) list.³⁰ Pollutants and stressors for the region are primarily bacteria indicators, phosphorus, toxicity, and turbidity. These listed locations were not assigned a high priority ranking for development of TMDLs. However, beach closures due to exceedances of bacterial standards are a major cause of concern to jurisdictions within this group, as well as the residents of the watersheds. Therefore the many municipalities in South Orange County are actively seeking resolution to regional water quality issues.

²⁸ San Juan Basin Authority, 2004, Draft EIR.

²⁹ County of Orange, 2003, *Drainage Area Management Plan*

³⁰ California State Water Resources Control Board, 2002, http://www.swrcb.ca.gov/tmdl/303d_lists.html

Improvement projects proposed by local agencies in the IRWM Plan suggest both direct and indirect solutions to water quality problems. It is also acknowledged that there is a great need for further study (follow-up investigations to Mission Bay microbial source tracking and epidemiology studies), so that the agencies can direct their efforts to abate the correct source of pollution in an effective manner. Constructed wetlands and watershed restoration plans simultaneously contribute to improved water quality and riparian habitats. Stormwater detention and treatment facilities are designed to improve water quality by mediating the effects of runoff pollution before drainage or percolation. Installation filters and catch basins also reduce pollutant loads carried through the watersheds. More than thirty quality-related projects are currently being planned within South Orange County, as discussed in Chapter 4. Projects such as these are essential to the quality concerns facing the region.

2.1.6 Sewage and Flood Management Objectives (SF)

Objective SF-1: Optimize capacity and reliability of sanitary and stormwater management systems.

Objective SF-2: Optimize handling of sanitary and stormwater wastes to minimize environmental and socioeconomic impacts.

Sewage/Flood Management

As mentioned above, stormwater detention and treatment facilities will be designed to improve water quality by mediating the effects of runoff pollution before drainage or percolation. As identified in the 2003–2004 Watershed Annual Reports, submitted by watershed permittee groups in South Orange County to the Orange County Stormwater Program in compliance with the current NPDES permits and the DAMP, approximately 1,850 pollution prevention, source control, and treatment control BMPs have been implemented within the last reporting year in South Orange County watersheds. These BMPs are designed to improve surface water quality, which is vital to any potential future development of surface water sources. Additionally, many recent projects serve to improve flood management as well through restoration of drainage channels and stream bank stabilization.

In recent years operators of wastewater collection facilities have increased the reliability of the collection systems by video survey of sewer mains, increased cleaning of sewer mains and construction of emergency overflow basins and back-up power supplies. Santa Margarita Water District has adopted a goal of having emergency storage of at least one hour of average flow at each of its sewage lift stations. The facilities are a sizable investment in finances and resources for the District but result in decreasing the potential of a sewage spill substantially.

Further, the Region continues to look for ways to improve sewer management by stabilizing transmission lines and identifying markets for recycled water. The South Orange County Wastewater Agency, which serves the Region, persists in pursuing more efficient wastewater

management. Through ongoing improvements to infrastructure, SOCWA ensures proper and secure treatment of wastewater. More importantly, SOCWA includes recycled water as an important component in the water supply mix. With diminished opportunities to find and develop potable water supplies, SOCWA and its member agencies seek to identify opportunities to expand recycled water usage to hedge against future drought scenarios, as well as reduce demands on imported water.

2.1.7 Information Management Objectives (IF)

Objective IF-1: Develop and maintain technical data management, research and analysis systems as appropriate to support the goals of the IRWM Plan.

Objective IF-2: Develop and implement public education programs and opportunities as appropriate to support the goals of the IRWM Plan.

Information Management

The County of Orange convened a Task Force to support a comprehensive effort to curb urban runoff specifically related to efficient outdoor water usage in Orange County. In cooperation with cities, water agencies, Homeowners' Associations, and various County agencies, the Task Force has begun to gather and organize available data on urban runoff reduction programs to facilitate cooperation amongst the stakeholders. Many of the Region's municipalities and water agencies have begun implementing water conservation programs and incentive plans to help decrease dependency on this critical resource. However, as these programs vary between cities and service areas, a regional plan would assist Orange County by resolving discrepancies and creating a unified vision of future outdoor water use. Strong initiative has already been shown by MWDOC, which conducts monthly meetings of a general water use efficiency workgroup for its member agencies. With this groundwork already in place, the Task Force can commence activities by building upon MWDOC's successes and expand outdoor water use efficiency programs to a countywide level. The Task Force has designed short and long-term goals, and determined that communication amongst the public and all involved agencies is fundamental to achieving its mission. These efforts to properly manage information and data exemplify South OC IRWM Group's dedication to continue building upon existing information.

These objectives have led the IRWM Group into developing specific strategies, discussed in Chapter 3. Implementation of strategies through integrated projects will:

1. Provide multiple benefits
2. Improve water supply reliability
3. Attain and maintain long term water quality standards
4. Enhance groundwater projects
5. Reduce/eliminate pollution in impaired water and sensitive habitat areas
6. Serve disadvantaged communities

2.2. Methodology of Determination

The IRWM Plan primarily focuses on local and regional projects and plans with an emphasis on water supply and water quality of potable, non potable and surface water sources. The key challenges identified earlier in this chapter include water reliability, water quality, water recycling, seasonal storage, watershed management, environmental protection, and funding. Through a series of meetings and discussions to address the Regions' challenges, the IRWM Group established the following water management categories:

1. Water Supply
2. Groundwater Management
3. Aquatic Ecosystems and Watershed Management
4. Water Conservation
5. Water Quality
6. Sewage and Flood Management
7. Information Management

The IRWM Group then formed a Plan Objectives Subgroup of representatives from watershed management agencies, water supply agencies – wholesale and retail, groundwater managers, wastewater agencies, and cities to establish objectives in each of the water management categories.

The Subgroup considered long-term regional planning of water supplies and water quality issues facing the Region over the next 20 to 50 years. Objectives within each water management category were then considered with the goal of maximizing limited water resources, protecting water quality, and enhancing the environment. This integrated approach assisted the Subgroup to identify multiple objectives in each water management category. Where appropriate, objectives were established quantitatively. For some objectives, quantifiable goals are more appropriately developed at the detailed strategic and/or project levels.

The draft objectives were then presented to the IRWM Group for review and discussion. Input, discussion and written comments were encouraged. Appropriate refinement to the objectives were made by select Subgroup representatives and presented back to the IRWM Group for final confirmation.

CHAPTER 3 REGIONAL WATER MANAGEMENT STRATEGIES

3.1 Summary of Strategies to Meet Plan Objectives

South Orange County has identified a range of water management strategies to meet regional objectives, including the following:

- Desalination – ocean and groundwater
- Ecosystem restoration
- Environmental and habitat protection and improvement
- Flood management
- Groundwater management
- Imported water
- Land use planning
- NPS pollution control
- Recreation and public access
- Storm water capture and management
- Surface storage
- Water and wastewater treatment
- Water conservation
- Water quality protection and improvement
- Water recycling
- Water supply reliability
- Water transfers
- Watershed planning
- Wetlands enhancement and creation
- Public education programs

The strategies above were carefully refined to reflect the unique needs of the South OC IRWM Region, and combined into specific water management categories. Appendix G provides additional detail regarding water supply planning within the Region. Section 3.3 below details the strategies within the categories that were identified as most appropriate for the Region.

3.2 Strategies Not Applicable to Region

Nearly all types of water management strategies are applicable and considered within the South OC IRWM Plan and proposed projects.

3.3 Integration of Strategies to Meet Plan Objectives

In many cases, strategies and projects primarily targeted at one plan objective will also support other plan objectives. Strategies and projects that address multiple objectives are typically the most cost-effective and resource-efficient, and are for the most part given higher priority in this first edition of the IRWMP. The Plan integrates regional strategies and objectives. This is made evident by identifying the complementary objectives and strategies.

The IRWM Group's approach to integration includes implementing various projects that, when combined, achieve a synergistic approach to watershed management. The method for achieving full integration of strategies is through the careful implementation of the various projects. Though the projects must address at least one of the strategies targeting a regional objective, the majority incorporate several complementary strategies, often to achieve multiple objectives. For example, projects that meet the water management strategy of water conservation, will also assist in meeting other strategies, including the following: water supply reliability and imported water by offsetting imported water supply needs; watershed planning through implementation of conservation measures throughout the watershed to enhance water use efficiency; environmental and habitat protection and improvement by utilizing recycled water supplies; and land use planning by effectively addressing water issues and ways to incorporate water conservation measures in proposed development. The method for achieving full synergy is through identifying projects where the majority of the projects incorporate several complementary strategies, often to achieve multiple objectives. Strategies and projects that address multiple objectives are typically the most cost-effective and resource-efficient, and are for the most part given higher priority in the IRWM Plan.

Refer to Tables 4.1-1 and 4.1-2 in Chapter 4, which show the proposed projects and the integration of water management strategies. Additionally, Appendix I includes a table showing the linkages of the Priority A top seven project with other IRWM Plan projects.

3.3.1 Water Supply Strategies

Implementation strategies for each key Water Supply objective are compiled below. Where appropriate, strategic targets for 2030 are quantified. In some cases, quantifiable targets are more appropriately identified and/or detailed at the project level, as described in Chapter 4.

Objective WS-1: Diversify the mix of water supplies to meet South Orange County's needs. This can be accomplished through Water Use Efficiency efforts (see Section 3.3.4), developing local sources such as Recycled water, Groundwater and Ocean water. In 2005, local sources including Water Conservation accounted for about 19% of supplies; by 2030 local resources are estimated to supply about 30% of total supplies. Total

demands are projected to increase by about 36,000 AF, while imported water sources are projected to decrease by as much as 17,000 AF.

Under the IWRM Plan, the following local resources shown in Table 3.3.1-1 are expected to be developed between 2005 and 2030

Table 3.3.1-1 Target Goals for Local Supply Development in South Orange County

Local Supply	Supply Developed 2005 to 2030 (AF)	Percent of 2030 Demands
Water Use Efficiency ⁽¹⁾	10,000	6%
Recycling ⁽²⁾	18,000	10%
Potable Groundwater ⁽³⁾	10,000	6%
Ocean Desalination ⁽⁴⁾	15,000	9%
Total ⁽⁵⁾	53,000	30%
Demand Increase Without WUE	36,000	
Potential Import Decrease Over Period	17,000	

- (1) WUE is really a demand reduction, but is presented as a supply in this comparison.
- (2) Recycling includes conventional as well as creek flow diversions put to beneficial uses
- (3) Includes San Juan Basin desalter, San Clemente well, South Coast desalter and potential expansions thereof.
- (4) Target for Dana Point ocean desalination project. As of 2005, a decision on the final feasibility has not yet been determined; work is proceeding.
- (5) Does not include supplies developed in Region 9 portion of IRWD

- **Strategy WS-1A:** The overarching goal outlined above to develop additional local resources, no matter how aggressively pursued, will still leave South Orange County highly dependent on imported water resources for about 70% of its needs. Because of this high level of dependence on imported water, the Region must continue to work with MWDOC and Metropolitan to ensure that reliability of imported supplies is maintained throughout the planning horizon. Based on the target amounts summarized above, South Orange County would actually decrease its need for imported supply over the period from 2005 to 2030, thus helping to improve the reliability of South Orange County and the Southern California Region.
- **Strategy WS-1B:** Development of potable supplies through desalination of ocean sources has the opportunity to produce 15,000 AF of supplies or possibly more by 2030. At this time, research is still underway to identify the opportunities and constraints to utilizing this source for potable supplies at

both the Dana Point and Camp Pendleton sites. It will still take a number of years of study and permitting work before these supplies can be brought on-line; the earliest expected on-line date is 2012.

- **Strategy WS-1C:** Increase production and distribution capacity for expanding the use of recycled water for non-potable purposes such as for irrigation of large landscape areas. Expansion of recycled supplies is expected to amount to 20,000 AF by 2030. This projection includes the use of some creek diversions for beneficial uses. (See section 3.3.2 for Groundwater Management via recycled water).
- **Strategy WS-1D:** Increase pumping and needed treatment of local groundwater for water supply, consistent with sustainability and conjunctive use with other supplies. The target for groundwater production for potable uses is 10,000 AF (this includes production from the San Juan Basin Desalter which is just under start-up at this time). Additional dry-year yield may be developed under the Groundwater Management Plan Section 3.3.2.
- **Strategy WS-1F:** This strategy has multiple benefits of eliminating or reducing non-native urban runoff from affecting riparian eco-systems and creating additional beneficial uses. At this time, it is difficult to project the quantity of supplies that could be developed from this source. Known project yields have been included within the recycling numbers. The goal would be to increase capacity to capture, treat and utilize dry-weather urban runoff and stormwater, primarily for non-potable uses.
- **Strategy WS-1G:** Investigate emerging technology and regulatory actions for decentralized on-site capture, storage and re-use of rainwater for irrigation purposes, consistent with water quality and vector control needs.

Objective WS-2: Improve South Orange County System Reliability to enable the local agencies to provide sufficient water supplies to their customers during both planned and unplanned emergency outages of the import water system by developing storage, local resources and interconnections with other agencies or regions of the County to be able to continue meeting customers demands without the benefit of the imported water system for a minimum of 7 days at average demands by 2010 and increasing the ability to meet customer demands without benefit of the imported system to 20 days at peak summer demands by 2020.

- **Strategy WS-2A:** Specific projects to improve the system reliability include:
 - Orange County Cross Feeder
 - Coastal Junction Pump Station
 - IRWD Interconnections
 - Groundwater Emergency Service Program
 - Construction of Upper and Lower Chiquita lined and covered reservoirs
 - Construction of an ocean desalination facility
 - Demand curtailment during an emergency by asking for help from the public

Objective WS-3: Reduce the vulnerability of water supply systems to droughts.

- **Strategy WS-3A:** Development of local supplies including recycling supplies, ocean desalination and water use efficiency improvements will help reduce the risk of drought exposure to the South Orange County Region.
- **Strategy WS-3B:** Pursue the use of water transfers from outside the Region to improve water supply reliability.
- **Strategy WS-3C:** Work with MWDOC and Metropolitan to ensure that imported supplies and the regional system of facilities remain highly reliable.

Objective WS-4: Ensure that an appropriate level of investment is made to meet water supply, water system and water quality objectives. Over investment or under investment are inappropriate strategies for the South County area. Water supply costs and retail rates will be developed to reward good water stewards and penalize water wasters.

3.3.2 Groundwater Management and Protection Strategies

Implementation strategies for the key Groundwater Management objectives are compiled below. Where appropriate, strategic targets for 2030 are quantified. In some cases, quantifiable targets are more appropriately identified and/or detailed at the project level, as described in Chapter 4.

Objective GM-1: Balance groundwater pumping with increased recharge capabilities to fully utilize the storage capability of the groundwater basins in South Orange County. Over the planning period through 2030, it is expected that the recharge capability and pumping capability of the San Juan Basin will be increased by about 7,500 AF, beyond the current 2005 dependable yield capacity of 7,300 AF. It may be possible to increase

the yield above this amount for additional dry-year yield with a plan for recharge and recovery of the basin. The existing operation of the basin will have to be monitored for several years with the San Juan Basin Project in operation to ensure that there will be no adverse effects.

- **Strategy GM-1A:** Increase recharge of managed groundwater aquifers in a cost-effective manner consistent with minimizing socioeconomic and environmental impacts.
- **Strategy GM-1B:** Increase pumping at underutilized groundwater aquifers where cost-effective and sustainable. This will include potential production from the San Clemente wells as well as possible production from the San Mateo Groundwater Basin. Arrangements with Camp Pendleton and/or the Bureau of Reclamation may need to be developed for usage of San Mateo water.

Objective GM-2: Protect the groundwater basins from contamination.

- **Strategy GM-2A:** Prevent saltwater intrusion into freshwater aquifers as pumping increases.
- **Strategy GM-2B:** Prevent contamination of aquifers by sewage, industrial or other wastes.

3.3.3 Aquatic Ecosystem and Watershed Management Strategies

Implementation strategies for the key Aquatic Ecosystem and Watershed Management objectives are compiled below. Where appropriate, strategic targets for 2030 are quantified. In some cases, quantifiable targets are more appropriately identified and/or detailed at the project level, as described in Chapter 4.

Objective AE-1: Optimize the healthy functioning of regional aquatic ecosystems, consistent with recreational needs and socioeconomic and infrastructural constraints.

- **Strategy AE-1A:** Eradicate *Arundo donax*, the most highly invasive exotic plant species within regional aquatic ecosystems. The Strategic Target for 2030 is 100% eradication for the entire aquatic ecosystem areas within the Region affected in 2005. Per-project performance would typically be measured by acreage eradicated and as percentage of riparian area within project limits.
- **Strategy AE-1B:** Eradicate other highly invasive plant species, including but not limited to Pampas Grass (*Cortaderia selloana*), and Tamarisk (*Tamarix spp*) from regional aquatic ecosystems and adjacent transitional habitats. Per-

project performance would typically be measured by acreage eradicated; estimated percent cover of target species; and as percentage of riparian area within project limits.

- **Strategy AE-1C:** Stabilize streambeds impacted by development-exacerbated stormflows, consistent with maintaining natural soft-bottom channels rather than hardened channels to the extent feasible. Per-project performance would typically be measured by linear feet and acreage of streambed stabilized.
- **Strategy AE-1D:** Convert hardened ditches and channels to widened soft-bottomed naturally-vegetated channels where feasible, consistent with the needs of erosion and flood control. Per-project performance would typically be measured by linear feet of converted channel; and acreage of soft-bottom channel created.
- **Strategy AE-1E:** Re-establish native aquatic, riparian and transitional biotic communities along streamcourses to the extent feasible. Per-project performance would typically be measured by linear feet of restored streamcourse; acreage of vegetation re-established; species diversity; and percent cover.
- **Strategy AE-1F:** Eliminate anthropogenic impacts to marine Areas of Special Biological Significance to the extent feasible. Per-project performance would typically be measured by number or acreage of sites retrofitted with control measures; and estimated reduction in daily or per-storm discharges to the ASBS.
- **Strategy AE-1G:** Design new infrastructure and/or retrofit existing infrastructure along streamcourses to minimize exacerbation of hydraulic impacts of stormflow on the streamcourse. Per-project performance would typically be measured by linear feet of stream channel and/or acreage of riparian vegetation protected.
- **Strategy AE-1H:** Construct artificial wetlands where feasible and appropriate to buffer the impacts of development on natural aquatic ecosystems. Per-project performance would typically be measured by area of wetland constructed; watershed area serviced by the wetland; estimated daily volume of dry-weather flow treated through the wetland; and estimated reduction through the wetland in average concentrations of specific pollutants of concern.

Objective AE-2: Manage developed areas to minimize impacts on downstream aquatic ecosystems to the maximum extent practicable.

- **Strategy AE-2A:** Promote the judicial incorporation or retrofitting of stormflow attenuation processes, devices and/or permeable surfacings into new and existing developments that disrupt natural hydrologic patterns. Per-project performance would typically be measured by the number and area of sites affected; and estimated reduction in storm runoff volume or rate compared to pre-project or conventional development.
- **Strategy AE-2B:** Promote the utilization of non-structural Best Management Practices, appropriate to land use type, to eliminate nuisance runoff and prevent potential pollutants from entering municipal storm drain systems and aquatic ecosystems, during both wet and dry weather. Per-project performance would typically be measured by the number and area of sites affected; estimated reduction in water usage or nuisance runoff volume or rate; and/or estimated reduction in quantity of key pollutants potentially exposed to discharge to the environment, compared to pre-project or conventional conditions.
- **Strategy AE-2C:** Promote the utilization of structural Best Management Practices, appropriate to land use type, to eliminate nuisance runoff and reduce the discharge of pollutants from municipal storm drain systems into downstream aquatic ecosystems, during both wet and dry weather. Per-project performance would typically be measured by the number and area of sites affected; estimated reduction in water usage and/or nuisance or stormwater runoff volume or rate; and/or estimated reduction in quantity of key pollutants potentially exposed to discharge to the environment, compared to pre-project or conventional conditions.
- **Strategy AE-2D:** Provide opportunities for controlled recreational access and enjoyment of aquatic ecosystem areas to minimize the environmental impacts of uncontrolled use. Per-project performance would typically be measured in linear feet or acreage of area made accessible; and estimated recreational use or capacity for use.

3.3.4 Water Conservation Strategies

Implementation strategies for the key Water Conservation objectives are compiled below. Where appropriate, strategic targets for 2030 are quantified. In some cases, quantifiable targets are more appropriately identified and/or detailed at the project level, as described in Chapter 4.

Objective WC-1: Reduce water demand by 9,700 AF 2005 increasing to more than 19,600 AF in 2030 through the implementation of Best Management Practice water use efficiency measures. The net increase due to Water Use Efficiency practices is expected at about 10,000 AF or more between 2005 and 2030.

- **Strategy WC-1A:** Promote the use and/or retrofitting of Weather Based Irrigation Timers in new and existing single-family homes and commercial landscapes. The Strategic Target for 2030 is 6,700 acre-feet reduction (50% of maximum potential achieved through active and passive activities) in water usage regionally compared to continuation of conventional systems. Per-project performance would typically be measured in the number of sites affected and per-site reduction in daily water demand compared to conventional development.
- **Strategy WC-1B:** Promote the use and/or retrofitting of irrigation system distribution uniformity improvements in new and existing developments. A distribution uniformity research project is needed to estimate the acre-feet reduction in water usage regionally compared to continuation of conventional systems. Per-project performance would typically be measured in the number and acreage of sites affected; and per-site reduction in daily water demand compared to pre-project or conventional development.
- **Strategy WC-1C:** Promote the use and/or retrofitting of more water-efficient plumbing fixtures, equipment and processes in industrial and commercial businesses. The Strategic Target for 2030 is 4,450 acre-feet reduction in water usage regionally, which includes the continuation of the existing rebate program through 2015. Per-project performance would typically be measured in the number of sites affected; and per-site reduction in daily water demand compared to pre-project or conventional development.
- **Strategy WC-1D:** Promote the use of native or non-native drought-tolerant low-water-use plants for landscaping in new developments and for retrofitting existing high-water use landscaping. Per-project performance would typically be measured in the number and acreage of sites affected; and per-site reduction in daily water demand compared to pre-project or conventional development.
- **Strategy WC-1E:** Promote the use of alternative landscape design features including permeable inert surfacing materials in lieu of high-water-use landscape ground covering plants in new developments and for retrofitting existing landscaping. Per-project performance would typically be measured in the number and acreage of sites affected; and per-site reduction in daily water demand compared to pre-project or conventional development.

3.3.5 Water Quality Pollution Reduction Strategies

Implementation strategies for the key Water Quality Improvement objectives are compiled below. Where appropriate, strategic targets for 2030 are quantified. In some cases, quantifiable targets are more appropriately identified and/or detailed at the project level, as described in Chapter 4.

Water Quality Improvement Objectives (WQ):

Objective WQ-1: Protect the quality of surface and groundwaters, consistent with their beneficial uses.

- **Strategy WQ-1A:** Promote the region-wide utilization of non-structural Best Management Practices, appropriate to non-point-source pollutants and land use types, to prevent potential pollutants from entering municipal storm drain systems and aquatic ecosystems, during both wet and dry weather. Per-project performance would typically be measured by the number and area of sites affected; and estimated reduction in quantity of key pollutants potentially exposed to discharge to the environment, compared to pre-project or conventional conditions.
- **Strategy WQ-1B:** Promote the region-wide utilization of centralized and decentralized structural Best Management Practices, appropriate to non-point-source pollutants and land use types, to minimize the discharge of pollutants into or from municipal storm drain systems and into downstream aquatic ecosystems, during both wet and dry weather. Per-project performance would typically be measured by the number and area of sites affected; estimated reduction in nuisance and/or storm runoff volume or rate; and/or estimated reduction in quantity of key pollutants potentially exposed to discharge to the environment, compared to pre-project or conventional conditions.
- **Strategy WQ-1C:** Install trash screens or gates at drainage inlets to keep trash out of storm drain pipes during dry weather, at locations where physical conditions and maintenance programs are suitable. The Strategic Target for 2030 is 75% coverage of suitable sites. Per-project performance would typically be measured by the number of sites affected; percentage of affected sites relative to total number of suitable sites; and reduction in quantity of trash and debris removed from drainage inlets compared to pre-project or conventional conditions.
- **Strategy WQ-1D:** Install in-line, end-of-pipe or other trash collecting devices within storm drain systems and/or tributary channels, to capture trash during low-flow and moderate-to-high flow storms, where feasible based on physical, economic and maintenance constraints. The Strategic Target for 2030 is 100% coverage of suitable sites. Per-project performance would typically be measured by the number of sites affected; percentage of affected sites relative to total number of suitable sites; and quantity of trash and debris removed from drainage systems.
- **Strategy WQ-1E:** Promote the installation, retrofit or updating of grease control measures at restaurants and other grease-producing sites to reduce sanitary sewer overflows and spills caused by grease blockages. The Strategic Target for 2030 is 100% coverage of susceptible sites. Per-project

performance would typically be measured by the number of sites affected; and percentage of affected sites relative to total number of susceptible sites.

- **Strategy WQ-1F:** Promote the installation, retrofit or updating of manure control measures from livestock areas to reduce contamination to downstream aquatic ecosystems. The Strategic Target for 2030 is 100% coverage of susceptible sites. Per-project performance would typically be measured by the number of sites affected; percentage of affected sites relative to total number of susceptible sites; and estimated reduction in quantity or percentage of manure potentially exposed to discharge to the downstream environment, compared to pre-project conditions.
- **Strategy WQ-1G:** Promote the development, installation, application or updating of pathogen control data, methods of measurement and management to protect high-use beaches. Short-term per-project performance may be measured by expansion of catalogued data, confirmation of previous data conclusions, identification of microbial pollution sources, and identification of accurate and rapid source tracking methods. Long-term per-project performance would typically be measured by estimated reduction in nuisance runoff volume or rate discharged to beaches; and/or estimated reduction in concentration or quantity of pathogens or indicator pollutants discharged compared to pre-project conditions.
- **Strategy WQ-1H:** Promote the installation, application or updating of toxics control measures to protect downstream aquatic ecosystems. Per-project performance would typically be measured by estimated reduction in quantity or concentration of toxic materials discharged or potentially exposed to discharge to the downstream environment, compared to pre-project conditions.
- **Strategy WQ-1I:** Promote the installation, application or updating of biostimulatory nutrients control measures to protect downstream aquatic ecosystems. Per-project performance would typically be measured by estimated reduction in quantity or concentration of biostimulatory nutrients discharged or potentially exposed to discharge to the downstream environment, compared to pre-project conditions.
- **Strategy WQ-1J:** Promote the installation, application or updating of erosion and sediment control measures to protect downstream aquatic ecosystems. Per-project performance would typically be measured by estimated reduction in sediment discharged to the downstream environment, compared to pre-project conditions.
- **Strategy WQ-1K:** Cap abandoned wells to protect groundwater aquifers from contamination by direct inputs from the surface. The Strategic Target for 2030 is 100% coverage of known susceptible sites. Per-project performance would

typically be measured by the number of sites capped compared to the number of susceptible sites.

- **Strategy WQ-1L:** Promote the installation and application of nuisance water diversions when determined to be an effective solution to impairments downstream. Per-project performance would typically be measured by the number of diversions installed and/or quantity of runoff diverted.
- **Strategy WQ-1M:** Promote the implementation of educational programming focused on water quality. Per-project performance would typically be measured by the number of impressions made.

3.3.6 Sewage and Flood Management Strategies

Implementation strategies for the key Sewage and Flood Management objectives are compiled below. Where appropriate, strategic targets for 2030 are quantified. In some cases, quantifiable targets are more appropriately identified and/or detailed at the project level, as described in Chapter 4.

Sewage and Flood Management Objectives (SF):

Objective SF-1: Optimize capacity and reliability of sanitary and stormwater management systems.

- **Strategy SF-1A:** Keep sanitary sewer and stormwater collection systems in good repair.

Objective SF-2: Optimize handling of sanitary and stormwater wastes to minimize environmental and socioeconomic impacts.

- **Strategy SF-2A:** Promote sewage biosolids composting and re-use for soil fertilization/conditioning, where appropriate. The Strategic Target for 2030 is 90% re-use of regionally-generated biosolids.
- **Strategy SF-2B:** Promote recovery and recycling of solid waste materials collected from streets and stormwater handling systems. The Strategic Target for 2030 is 75% recovery and recycling of regionally-generated solid wastes.

3.3.7 Information Management Objectives

Implementation strategies for the key Information Management objectives are compiled below.

Information Management Objectives (IF):

Objective IF-1: Develop and maintain technical data management, research and analysis systems as appropriate to support the goals of the IRWM Plan.

- **Strategy IF-1A:** Promote the use of Geographic Information Systems, data bases and other data management tools in support of IRWM Plan goals.
- **Strategy IF-1B:** Promote scientific research, technological development, and investigative studies as needed to support IRWM Plan goals.

Objective IF-2: Develop and implement public education and information programs and opportunities as appropriate to support the goals of the IRWM Plan.

- **Strategy IF-2A:** Promote public education programs and opportunities as appropriate to support the goals of the IRWM Plan.
- **Strategy IF-2B:** Promote professional, worker and student educational opportunities as appropriate to support the goals of the IRWM Plan.
- **Strategy IF-2C:** Promote informational programs for elected officials and regulatory personnel as appropriate to support the goals of the IRWM Plan.

3.4 Benefits of Integration to Meet IRWM Plan Objectives

Integration of strategies to meet the IRWM Plan objectives enhances the benefits of project implementation. To integrate the Plan's strategies with the objectives, the South Orange County IRWM Group has identified eight programs in which projects are categorized, as shown in Chapter 4. These programs further define the types of projects the South Orange County IRWM Group proposes to implement: water supply, water conservation, water quality/habitat restoration, water quality/pollution reduction, storm/flood/sewer, education, data management, and other.

The advantages of an IRWM Plan as opposed to individual plans are significant. Table 5.1-1 shows the existing local and regional plans, documents and programs that were reviewed and compiled to create the South OC IRWM Plan. The research and review process itself brought together the 28 IRWM Group members and allowed an open exchange/dialogue of existing and future plans to take place. The IRWM Plan is beneficial as a comprehensive document for the region in that it serves as a catalyst to implementing projects on an integrated basis, meaning that projects were prioritized based on readiness to proceed and accomplishment of one or more of the following strategies: water supply, groundwater management and protection, ecosystem restoration, water conservation and water use efficiency, watershed management and planning, and water quality pollution reduction. To meet each strategy, one

or more projects was either pulled from existing plans in its entirety or created through combining projects from different plans. As a result, the most immediate needs and balanced implementation were identified. Without the integrated South OC IRWM Plan, the efficiency of project implementation and achieving regional benefits would be significantly less and progress at a slower, segmented pace.

Projects are integrated on a water management strategy level. For example, projects that meet the water management strategy of water conservation, will also assist in meeting other strategies, including the following: water supply reliability and imported water by offsetting imported water supply needs; watershed planning through implementation conservation measures throughout the watershed to enhance water use efficiency; environmental and habitat protection and improvement by utilizing recycled water supplies; and land use planning by effectively addressing water issues and ways to incorporate water conservation measures in proposed development.

Interregional benefits/advantages include increased opportunity for project implementation, collective planning to monitor regional changes and facilitate refinements for implementation, increased participation and cooperation by the public, shared costs, and cooperative land-based planning as opposed to confinement within political boundaries.

Since each project accomplishes several aspects of water management for the region, the eight programs identified in Chapter 4 provide a comprehensive look at the strategies and objectives that the projects accomplish.

3.5 Benefits within the Region and Adjacent Areas

Implementation of the IRWM Plan and its projects will lead the Region into a future with a reliable water supply, protected and improved water quality, and achievement of the statewide priorities and program preferences for integrated regional planning. The IRWM Plan has served as an impetus to bring stakeholders together to discuss common goals, address concerns, and brainstorm solutions. This clearly addresses the IRWM Plan purpose of “Total Watershed Efficiency.”

As the Plan is implemented and benefits of water supply and water quality are realized, so will adjacent areas and regions benefit from the South Orange County regional efforts. Development of South Orange County local supplies and enhancement of reliability of its existing supplies also provides enhanced reliability of imported water suppliers for other regions. When dependence on imported water for the Region is reduced, water supply to other regions will increase, enhancing their reliability.

Long-term attainment and maintenance of water quality standards within the watersheds throughout the Region will result in enhanced local supplies, habitat restoration, pollution control, and increased outdoor recreational opportunities. Pollution reduction in impaired water bodies and sensitive habitat will benefit wildlife that make South Orange County their habitat. Overall watershed health realized in the Region provides greater opportunities for

communities to enjoy the area in which they live, including beach activities, hiking, biking, bird watching, horseback riding, and other activities that thrive in this Region.

The IRWM Plan will establish an integrated regional water management model that could be used as a model for other regions and areas of the State. Individual projects that are implemented and produce beneficial results may also be used as pilot projects that are transferable to other regions. Regional planning presents the opportunity for collective and collaborative planning in a logical and beneficial process. The prioritization of projects within the Region provides the greatest benefit for the greater good.

Moreover, it is important to recognize that the objectives of the Region regarding water supply reliability, groundwater management, water conservation, and water quality / pollution reduction, along with achievement of specific statewide priorities, clearly require regional solutions. In certain cases, “Regional Action Projects” have been defined where appropriate to implement a single strategy across the entire region that would involve all participants on a phased, as-needed funding basis. Regional solutions are being implemented in the following objectives:

- » Diversify the mix of water supplies.
- » Improve water system reliability.
- » Reduce vulnerability to drought.
- » Ensure appropriate level of investments.
- » Implementation of Best Management Practices water use efficiency measures.
- » Protect the quality of surface and groundwaters.
- » Optimize handling of sanitary and stormwater wastes to minimize environmental and socioeconomic impacts.
- » Public education programs and opportunities.

Collaboration of regional projects and priorities will achieve substantially enhanced regional benefits, increased opportunity for project implementation, collective planning to monitor regional changes and facilitate refinements for implementation, increased participation and cooperation by the public and interregional benefits to adjacent areas. Certain watershed and habitat areas and the improvements made to them know no boundaries. Neighboring regions will experience benefits from the implementation of the South Orange County IRWM Plan.

3.6 Benefits to Disadvantaged Communities / Environmental Justice

Disadvantaged communities are a major concern for the IRWM Group. In order to address disadvantaged communities, the IRWM Group has made it a top priority to incorporate disadvantaged communities within their projects. The disadvantaged communities of South Orange County, as discussed in Section 1.1.6, Disadvantaged Communities, predominantly utilize the waters within the Region as recreational hubs. Waters within the Region include area beaches, local creeks and streams, and wetland environments. Since these waters are 100 percent accessible to the disadvantaged communities of South Orange County, projects focusing to provide safe drinking water and enhance water quality will primarily benefit these communities. Figure 8 depicts the disadvantaged communities throughout the entire

South Orange County IRWM Region. In addition, Figures 9 through 12 highlight a closer look at the disadvantaged community areas of the Region.

Water quality of the watersheds greatly impacts the recreational opportunities for the disadvantaged community members, especially since portions of the watersheds that drain into the beach areas are impaired waters. The San Diego Regional Water Quality Control Board has designated beneficial uses for many of the watershed waters for agricultural supply, contact and non-contact water recreation, warm freshwater habitat and wildlife habitat. Groundwater municipal supply is a beneficial use in the San Juan basin and easterly portion of Aliso Creek. Projects proposed in this plan will contribute to each of these beneficial uses, enhancing the opportunity to disadvantaged communities.

Coastal Benefits

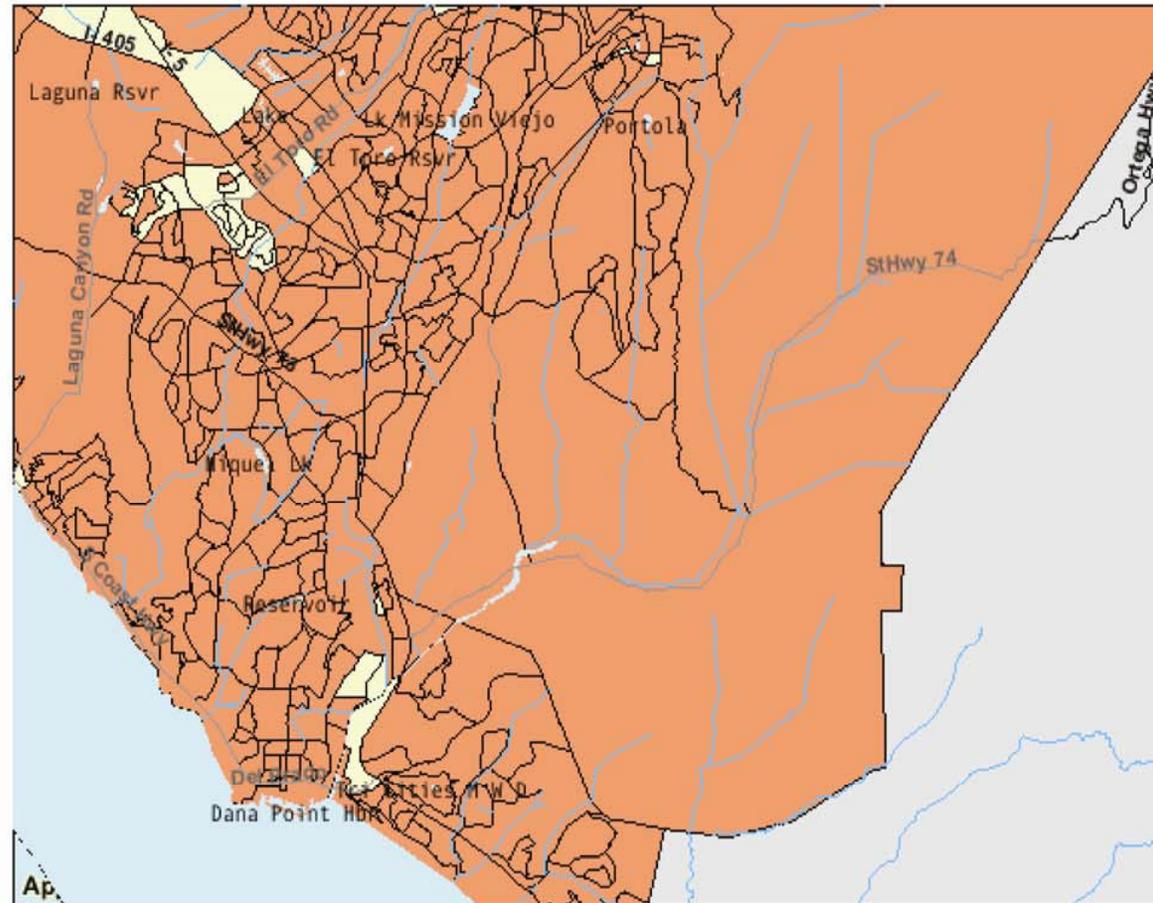
The surrounding areas of Doheny State Beach Park, the Dana Point Harbor, area beaches, and parks located along regional stream courses serve as community gathering places for these communities and are used heavily year round on the weekends. Many of the recreational areas are accessible via public transit and often do not charge an entrance fee for walk-in visitors. Many recreational areas are also handicapped accessible. In 2002, 25 percent (461,491) of a total 1,833,838 visitors were free visitors who did not drive into the recreational areas of the Region.³¹

Several projects within this Plan focus on identifying the cause of water pollution for Doheny Beach and other beaches within the Region. One project in particular, the Aliso Creek Water Quality SUPER Project (combines Priority A projects 8 and 9) will provide greatly improved water quality at Aliso Creek Beach for disadvantaged communities especially, low-income apartment complexes along the upper Aliso Creek. Aliso Creek beach is accessible through the Orange County Transportation Authority bus system since it is a facility of the County of Orange. This beach along with beaches and parks in the Region serve the disadvantaged communities equally since there is no entrance fee.

The City of San Clemente Recycled Water Treatment and Distribution project will reduce wastewater effluent into the ocean accommodating disadvantaged communities, given that neighborhood parks and beaches have become their weekend retreat. Disadvantaged communities will continue to enjoy the beach and ocean resources as a result of fewer beach closure days due to higher water quality. Water quality is a key consideration for the Region to ensure protection of the health and safety of the entire population in the area, especially for the disadvantaged community residents that do not have the means to travel to other areas of the state or country.

³¹ Doheny State Beach Preliminary General Plan and Draft EIR, Section 2.1.5 Park Users, Page 2-12, December 2003, <http://www.parks.ca.gov/pages/21299/files/dohenysbfinalgeneralplan&eir.pdf>

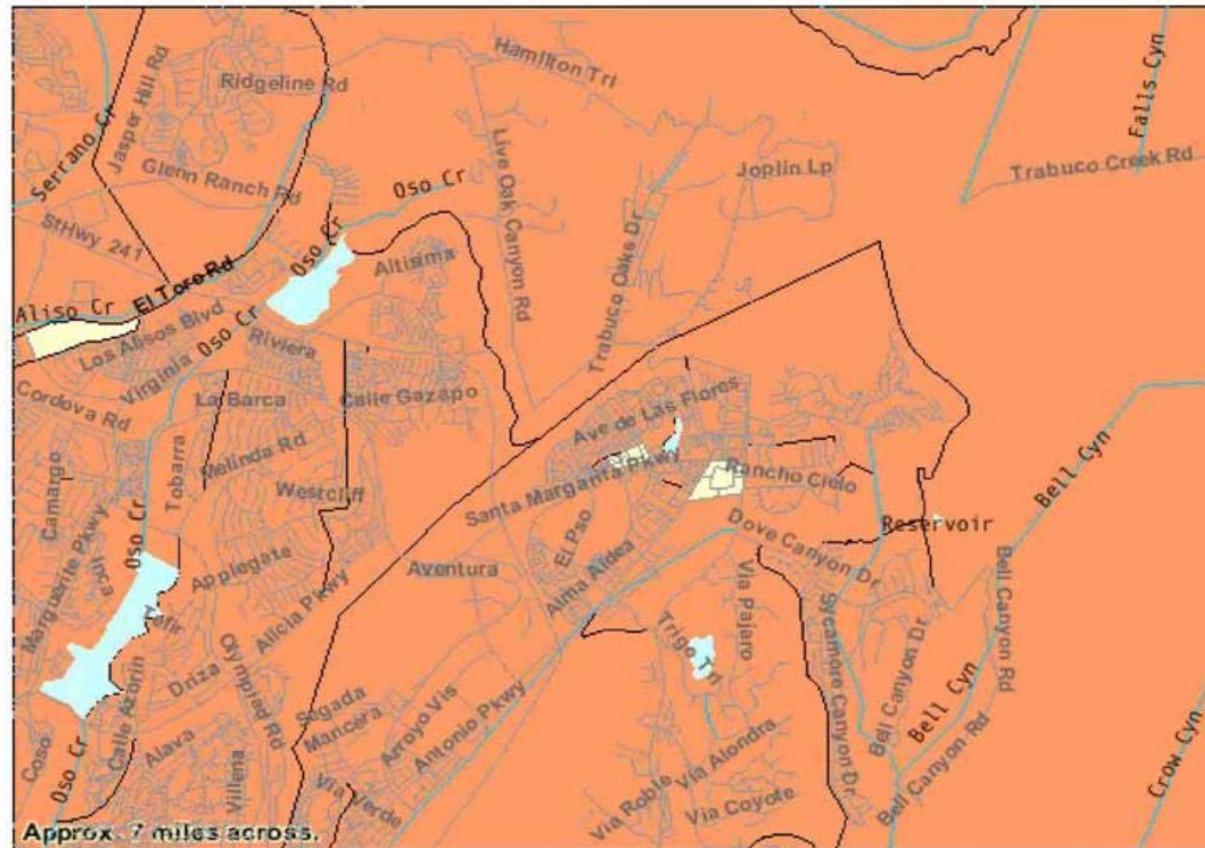
- Data Classes**
- Dollars
- 0 - 37994
 - 37995 - 200001
- Features**
- Major Road
 - Street
 - Stream/Waterbody
 - Stream/Waterbody



Regional Map of Disadvantaged Communities

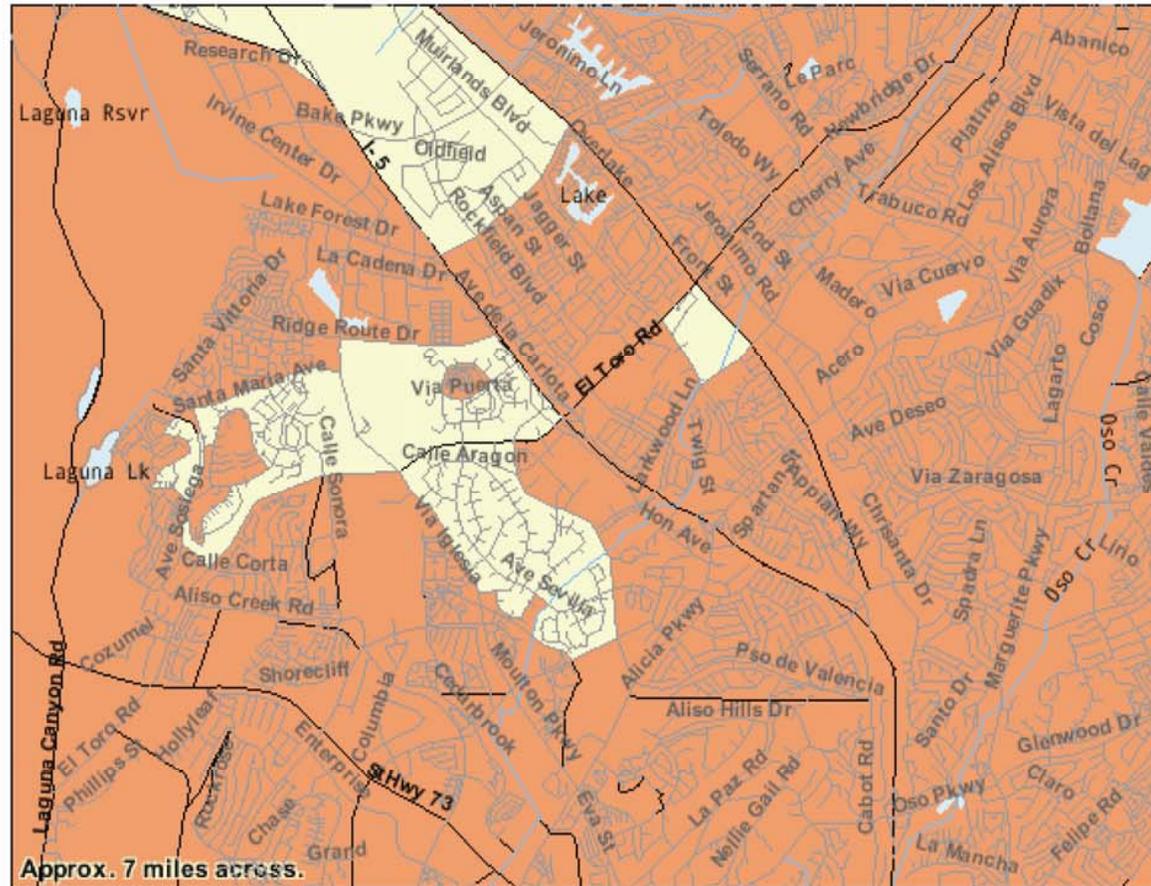
Figure 8

- Data Classes**
- Dollars
- 0 - 37994
 - 37995 - 200001
- Features**
- Major Road
 - Street
 - Stream/Waterbody
 - Stream/Waterbody



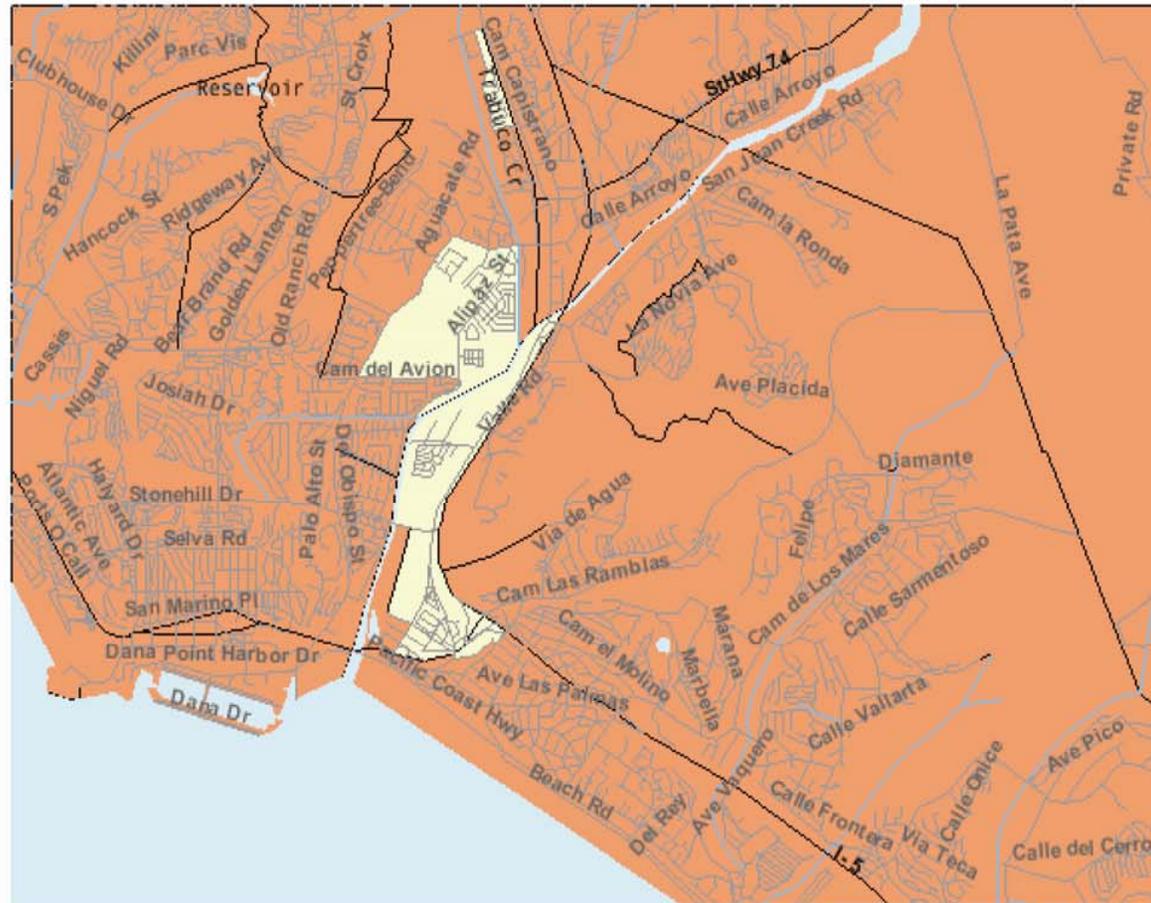
Regional Map of Disadvantaged Communities - Northeast
Figure 9

- Data Classes**
- Dollars
- 0 - 37994
 - 37995 - 200001
- Features**
- Major Road
 - Street
 - Stream/Waterbody
 - Stream/Waterbody



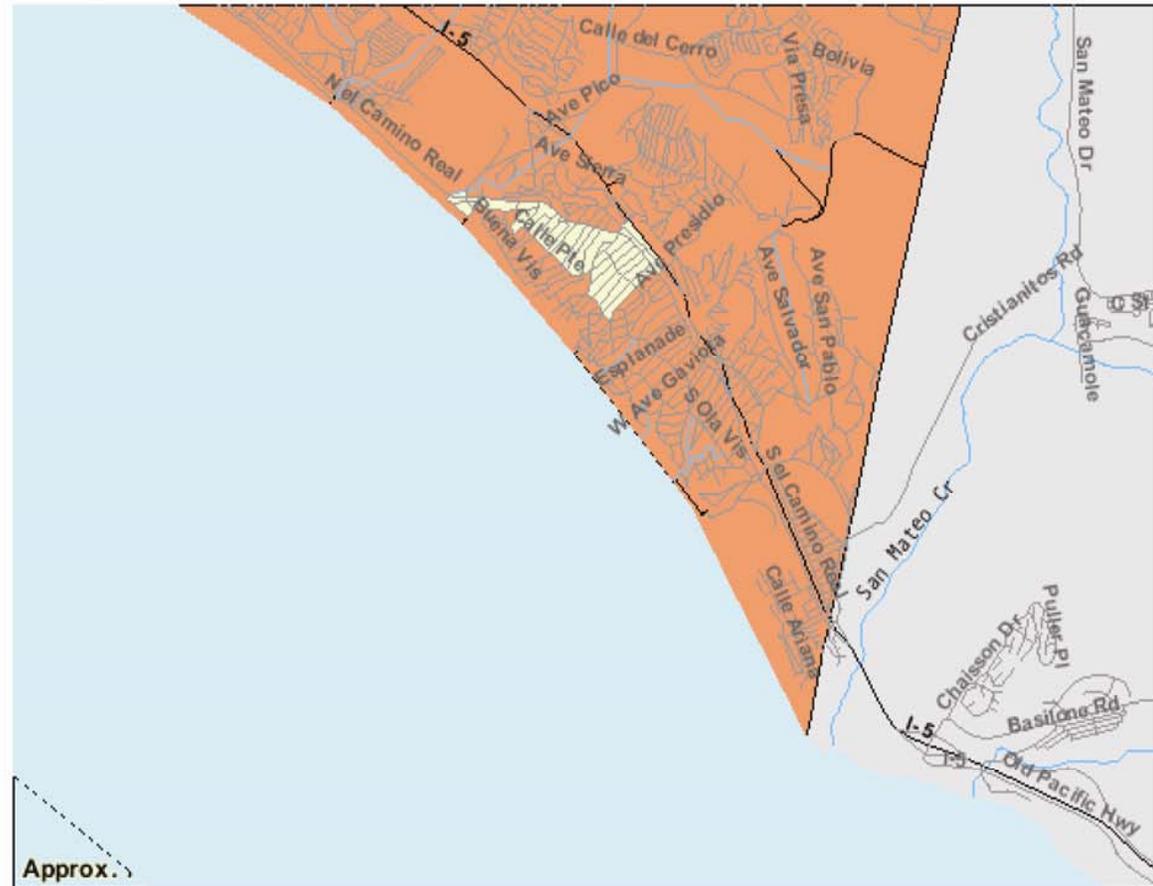
Regional Map of Disadvantaged Communities - Northwest
Figure 10

- Data Classes**
- Dollars
- 0 - 37994
 - 37995 - 200001
- Features**
- Major Road
 - Street
 - Stream/Waterbody
 - Stream/Waterbody



Regional Map of Disadvantaged Communities - Southwest
Figure 11

- Data Classes**
- Dollars
- 0 - 37994
 - 37995 - 200001
- Features**
- Major Road
 - Street
 - Stream/Waterbody
 - Stream/Waterbody



Regional Map of Disadvantage Communities - South
Figure 12

Inland Benefits

Multiple creek restoration, wetland, and Arundo removal projects are proposed in the Region, as well as improvements to the Heisler Park Ecological Reserve, a main attraction in the Region for more than 3 million people annually. The Heisler Park Marine Habitat Protection project is relatively near to a large portion of disadvantaged community residents who easily access and utilize this area for passive recreational activities. This and other creek habitat and restoration projects will significantly benefit the continued enjoyment of the Region's natural systems for the low income populations.

These projects would meet multiple objectives and provide multiple benefits, including recreational and aesthetic benefits. Expanded opportunities for recreational benefits include contact and non-contact water recreation, walking paths, bird watching, nature study, painting and photography, and other passive activities that would become available at no cost to all community members.

Additional recreational opportunities will result from installation of artificial turf fields at Bear Brand Park in Laguna Niguel. This will enable expanded hours of operations of the recreational fields resulting from reduced maintenance time, increasing the opportunity for use by disadvantaged communities.

Educational and public outreach activities will also increase residents' understanding and appreciation of wetlands and other areas of significance, including how human interaction impacts habitat areas and other natural resources. Natural areas that are open and available to the public at no cost are generally utilized by disadvantaged community members, whom can become stewards of the environment with through information and education. The proposed Orange Coast Watershed Center will fill the regional need for a venue offering practical public education in the stewardship of watershed, energy and material resources. The Center will be used for educational and recreational purposes, and provide and demonstrate environmental benefits. The project will inspire broad implementation of water quality and water conservation improvements across the community.

Additional projects within the Region continue to incorporate measures to improve infrastructure needs in disadvantaged communities, such as offering catch basin insert installation to multi-family housing complexes where economically disadvantaged concentrations are significant.

Benefits of Disadvantaged Community Participation

Through addressing water quality issues in areas of recreational use, the IRWM Plan incorporates environmental justice in a way that provides every resident equal opportunity and fair treatment in the regional water planning process. As part of the disadvantaged communities, the IRWM Group has and will continue to actively involve regional minority communities, including the Juaneno Band of Mission Indians and Hispanic community groups to ensure their active involvement in the IRWM Plan. Additionally, the IRWM Plan projects have recognized the benefits to support disadvantaged communities within their areas of influence. The IRWM Plan and implementation of its projects will significantly benefit the Region's disadvantaged communities and support regional environmental justice.

3.7 Environmental Impacts / Benefits to Other Resources

The regional watersheds contain a wide variety of environmental resources, extending from headwaters to ocean, and from urban landscape to forested mountaintop. These resources include water, wildlife, cultural and physical landscapes; in short every physical entity that surrounds those that find themselves within the boundaries of the watersheds themselves.

Currently, local watersheds are suffering from a variety of water resource and related land resource problems. Most of these are related to widespread changes in the watersheds, including changes in the hydrologic regime, channel instability, habitat loss, ecosystem degradation, declines in water quality, threats to recreational resources, and others. While change is a part of the evolution of any landscape, dramatic change from a balanced historic state often results in undesirable consequences.

All proposed projects within the IRWM Plan are individually evaluated under CEQA guidelines to identify potential impacts (both negative and beneficial) to the following:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

Where significant potential negative impacts are identified, the CEQA/NEPA process will implement appropriate mitigation measures into the project. Responsibility for mitigation measures lies with the individual project sponsor(s). Where there are potential impacts to jurisdictional waters, habitats or species, mitigation requirements are determined within permitting processes with the RWQCB, US Army Corps of Engineers, and California Department of Fish & Game. Federal anti-degradation policies for surface water quality and "no net loss" policies for wetlands are typically reflected in the permit requirements. The Priority A Projects Summary Table for the top seven priority projects in Appendix I includes the status of the CEQA/NEPA process for each of these projects, including analysis of potential negative impacts. Appendix I also includes a section for scientific basis where supporting data/studies are identified and includes potential negative impacts. In addition, the data management methods identified in Section 4.6 will work in conjunction with environmental impact analysis and ongoing project monitoring to identify potential impacts.

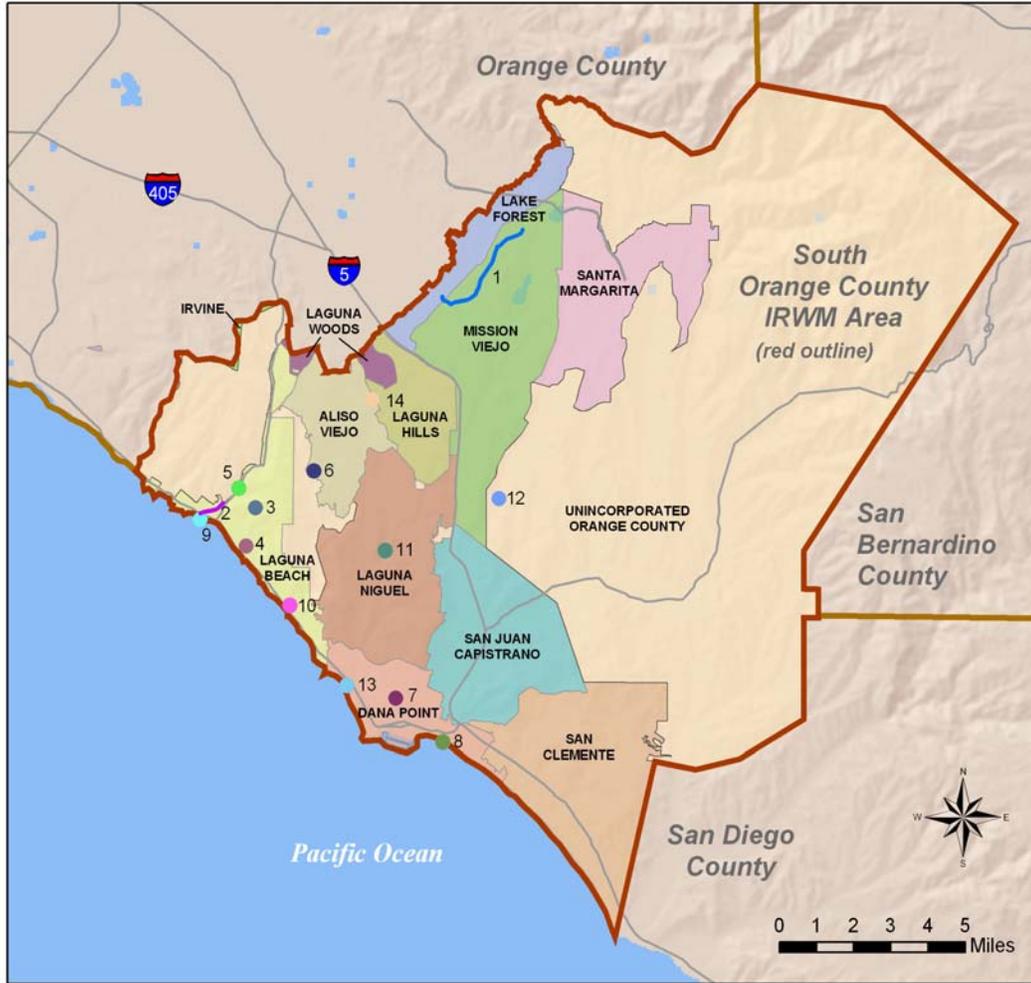
CHAPTER 4 IMPLEMENTATION PRIORITIES, PROJECTS AND PROGRAMS

The objectives described in Chapter 2 of this IRWM Plan are centered on improving water supply reliability; enhancing water quality; and reducing pollution in surface waters, including sensitive habitat areas. A complete set of strategies that will enable the Region to reach its objectives are described in Chapter 3. Within this chapter, specific capital improvement projects and programs have been prioritized with consideration of implementing these strategies within a 20-year planning horizon.

Although many of the IRWM projects and programs have multipurpose benefits and/or will integrate multiple strategies, the following water management strategies have been identified by the IRWM Group as the primary strategies (or categories) based on the primary purpose for each project.

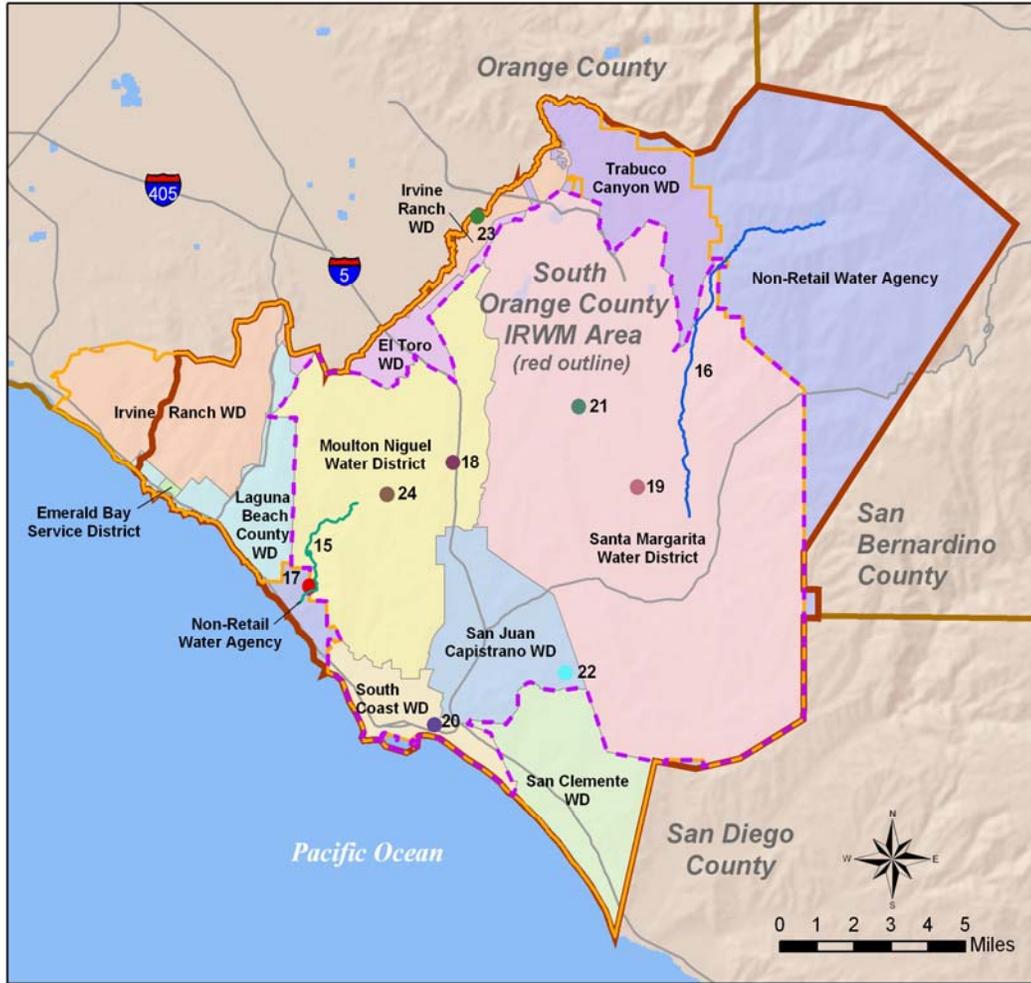
- Water Supply
- Water Conservation
- Aquatic Ecosystems and Watershed Management
- Water Quality/Pollution Reduction
- Sewer and Flood Management
- Education and Information Management
- Other

The specific projects listed within each category are being developed by one or more of the public agency partners under the IRWM Plan. In certain cases, “Regional Action Projects” (RAP) have been defined where appropriate to implement a single strategy across the entire region that would involve all participants on a phased, as-needed funding basis. Each project is detailed, without regard to priority, in Appendix H. The projects included in this plan, as listed in Appendix H, are shown in Figure 13 and Figure 14 within the cities and special districts, respectively.



- English Creek Aquatic Restoration (1)
- Laguna Canyon Creek Restoration Project (2)
- Atlantic Way Storm Drain Project (3)
- Bluebird Canyon Creek Restoration Project (4)
- Canyon Acres Storm Drain Project (5)
- Canyon Vista Emergent Wetland Project (6)
- Dana Point Xeriscape Demo Community Garden (7)
- Doheny State Park Beach/San Juan Creek Project (8)
- Heisler Park Marine Habitat Protection Project (9)
- North Coast Interceptor Repair Project (10)
- Orange Coast Watershed Center (11)
- SJC Well Site No.5 & Cooks Well Development (12)
- Salt Creek Phase II Treatment/Recycling Facility (13)
- Wood Canyon Emergent Wetland Project (14)

**IRWM Member Cities
and Proposed Projects**
Figure 13



- | | |
|---|---|
| IRWM Boundary | Aliso Creek Water Recycling Project (17) |
| SOCWA Boundary | Galivan Basin Desalter Project (18) |
| SJBA Boundary | Gobernadora Multipurpose Basin Project (19) |
| Aliso Creek Emergency Sewer Repair (15) | J.B. Latham Advanced Water Treatment Plant (20) |
| Bell Canyon Riparian Enhancement Project (16) | Phase I Upper Chiquita Emergency Storage Reservoir (21) |
| | SOCWA/OCSD Enclosed Biosolids Composting Facility (22) |
| | Water Filter Backwash Recovery Project (23) |
| | Water Harvesting/Reuse at L.N. Regional Park (24) |

**IRWM Member Districts
and Proposed Projects**
Figure 14

The following sections identify and prioritize each project by Priority A Projects and Priority B Projects.

4.1 Priority A Projects

For purposes of this Plan, the highest priority is given to capital improvement projects that have been collectively determined by the IRWM Group to most strongly support the multipurpose objectives of the IRWM Plan. High priority projects were determined based on the following factors:

- Importance of the project to progress toward Regional objectives.
- Appropriate multipurpose balance achieved between the four key water strategy categories: Water Supply, Water Conservation, Water Quality and Aquatic Ecosystems and Watershed Management.
- Equitable geographic distribution and participation by all IRWM Plan agencies is achieved.
- Ready to begin implementation by 2007-2010.
- Commitment by individual agency sponsors to incorporate local funding within their fiscal year budget planning processes.
- Environmental clearance is already achieved, in progress, or readily achievable for the project.

The highest-ranking Priority A capital improvement projects are listed in Tables 4.1.-1 and 4.1-2, by Priority and Water Management Strategies respectively. The tables also show the project timeframe for implementation. The IRWM Group will continue to evaluate regional priorities and modify the high-ranking Priority A Projects list appropriately.

Table 4.1-1 2005 IRWM Plan Priority A Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
1a	Water Conservation	MWDOC	Water Efficiency Program Expansion - Phase I	Phase I: Expand rebate program for weather-based irrigation technology (ET Controllers).	\$2,020,000	1,000	10/1/06	3/1/09	1/1/06	6/1/09	
1b	Water Conservation	REGIONAL ACTION PROJECT	GreenBack Program - Phase I	Administered by MWDOC, includes region cities: Landscape renewal rebate program aimed at encouraging structural conversion of existing landscapes.	\$876,000	50	12/1/07	3/1/09	12/1/07	3/1/09	CEQA/NEPA Complete
2	Water Supply	Santa Margarita Water District	Gobernadora Multipurpose Basin	Construction of storm detention basin that will be established as a wetland/riparian habitat to treat urban runoff and storm flows.	\$10,050,000	725	7/1/06	7/1/07	7/1/07	continuous monitoring	CEQA/NEPA 1/2004-6/2006
3	Water Quality / Pollution Reduction	Laguna Beach	Heisler Park Marine Habitat Protection	Construction of multi-beneficial water quality improvements to protect the adjacent Heisler ASBS.	\$1,616,000		12/1/06	5/1/07	5/1/07	12/1/07	CEQA/NEPA 6/1/04-6/1/05
4	Water Supply	ETWD, IRWD, & MNWD	Joint Recycled Water Treatment and Distribution	Water Recycling Facility and Distribution	\$13,790,900	3,000	5/1/07	7/1/08	6/1/08	ongoing	CEQA/NEPA 2/1/05-6/1/06
5a	Water Supply	SOCWA	J.B. Latham Treatment Plant - Advanced Water Treatment Project	Final design and construction of 11 MGD advanced water treatment facility at J.B. Latham Treatment Plant	\$15,654,760	5,000	7/1/06	7/1/07	7/1/07	continuous monitoring	CEQA/NEPA 07/01/05-6/1/06
5b	Water Supply	San Juan Capistrano	Recycled Water Transmission System Improvements	The San Juan Capistrano Recycled Water Transmission System Improvements Project will construct transmission mains and a recycled water reservoir as the next phase of improvements to the recycled water system.	\$20,843,000	4,000	10/1/06	1/1/08	1/1/08	1/1/09	Posted Negative Declaration 6/25/01, State Clearing House 8/2001
6	Water Supply	San Clemente	Recycled Water Treatment and Distribution	Expansion of the City's reclamation treatment and distribution systems.	\$14,112,000	2,900	10/1/07	12/1/08	12/1/08	ongoing	10/1/05 - 6/1/06; Possible Categorical Exemption or Negative Declaration
7	Water Quality / Habitat Restoration	Aliso Viejo	Wood Canyon Emergent Wetland Project	Construction of emergent wetland to enhance habitat, support functions/values, improve water quality, and mitigate channel incision, degradation, and flooding.	\$204,000		10/1/06	11/1/06	11/1/06	11/1/09	CEQA/NEPA: Completed
8	Water Quality / Habitat Restoration	County of Orange/ SOCWA/MNWD	Aliso Creek Mainstem Ecosystem Restoration and ACES	Stream restoration, stabilization, and replacement/relocation of utility lines in the Aliso Creek from upstream of the SOCWA bridge to Pacific Park Dr.	\$15,010,000		7/1/07	7/1/09	7/1/09	7/1/10	CEQA/NEPA 12/1/05-6/1/06
9	Water Supply	SCWD	Water Harvesting on Aliso Creek	Utilizes Mobile Urban Runoff Filtration technology to intercept and treat contaminated urban runoff and produce a high purity recycled water product	\$627,000		8/1/2006	10/1/2006	11/1/2006	11/1/2007	CEQA/NEPA 12/1/05-3/1/06
10	Water Conservation	REGIONAL ACTION PROJECT	DRPP - Demand Runoff & Pollution Prevention	Encourages structural conversion of existing landscape features that have a high impact on urban runoff quantity/quality and water demand		400					
10			SAN JUAN CAPISTRANO: Marco Forester Middle School Soccer Fields		\$1,124,510		3/1/06	10/1/06	n/a	n/a	CEQA/NEPA 11/1/04-2/1/05
10			LAGUNA NIGUEL: Synthetic Grass at Bear Brand Park Soccer Field		\$1,124,510		7/6/05	9/1/06	10/1/06	3/1/07	CEQA/NEPA 1/2006 - 4/2006
10			LAGUNA NIGUEL: Crown Valley Parkway Median Improvements		\$505,891		7/7/07	7/1/08	3/1/08	6/1/08	CEQA/NEPA 3/7/06-6/30/06
10			MISSION VIEJO: Marguerite Parkway Median & Slope Improvements		\$1,475,944		7/6/05	7/1/08	7/1/08	7/1/09	Based upon \$7/sq. ft. conversion costs.
10			MISSION VIEJO: Trabuco Road Median Improvements		\$573,712		7/6/05	7/1/08	7/1/08	7/1/09	Based upon \$7/sq. ft. conversion costs.
10			LAGUNA WOODS: El Toro Median Landscaping Update, Moulton to Paseo de Valencia		\$177,616		7/1/06	11/1/06	11/1/06	3/1/07	CEQA/NEPA Complete
10			LAGUNA WOODS: El Toro Median Landscaping update, Calle Sonora to Moulton		\$83,840		11/1/06	3/1/07	3/1/07	7/1/07	CEQA/NEPA 7/1/05 - 8/1/05

Table 4.1-1 2005 IRWM Plan Priority A Projects - By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
10				LAGUNA WOODS: Moulton Parkway Median Landscaping Improvements, Santa Maria to Southern City Limit	\$1,294,990		6/1/07	7/1/08	7/1/08	12/1/08	CEQA/NEPA 7/1/05 - 11/1/05
10				LAGUNA HILLS: Oso Parkway Median Landscaping Improvements	\$1,071,483		3/1/07	9/1/07	9/1/07	1/1/08	Based upon \$7/sq. ft. conversion costs.
10				LAGUNA HILLS: Moulton Parkway Median Landscaping Improvements	\$647,639		3/1/07	9/1/08	9/1/08	12/1/08	Based upon \$7/sq. ft. conversion costs.
11	Water Quality / Pollution Reduction	REGIONAL ACTION PROJECT	CURE - Cleaning Urban Runoff Efficiently	Cleaning Urban Runoff Effectively: Pollution Treatment and Trash & Debris Controls for Impaired Waterbodies							
11				ALISO VIEJO: Dairy Fork Trash Removal & Wetland Treatment	\$262,750		8/1/07	11/1/07	11/1/07	11/1/11	CEQA/NEPA 7/1/06-7/1/07
11				RANCHO SANTA MARGARITA: Treatment Vaults in 2 Locations	\$332,100		3/1/07	6/1/07	n/a	n/a	CEQA/NEPA Complete by 7/1/06
11			<i>current action due to ASBS status</i>	LAGUNA BEACH: Urban runoff diversion and storm water filter systems at 5 beach priority storm drain outlet locations at Bluebird, Laguna Ave., Gaviota, Mountain Ave., and West St.	\$961,400		4/1/07	5/1/07	6/1/07	12/1/07	CEQA/NEPA complete
11				MISSION VIEJO: Installation of Treatment Vault at end of 81-inch pipe, J01P03	\$181,510		7/1/06	7/1/07	7/1/07	9/1/07	CEQA/NEPA 1/2005-2/2006
11				SAN JUAN CAPISTRANO: Update grease control BMPs at grandfathered restaurants	\$301,200		7/1/06	9/1/07	n/a	n/a	CEQA/NEPA N/A
11				SAN JUAN CAPISTRANO: Retrofit streamside horse stables with surface & subsurface BMPs	\$935,080		10/1/06	10/1/08	n/a	n/a	
11				COUNTY AND CITIES: Installation of Catch Basin Debris Screens (~900)	\$1,139,500		7/1/06	7/1/09	7/1/08	10.1.09	
11				DANA POINT: 150 Catch Basin Filter Upgrades	\$45,500		7/1/06	7/1/08	7/1/08	7/1/09	Project costs based upon \$300 per filter.
11				LAGUNA BEACH: Catch Basin Filter Retrofits at 20 Locations	\$40,500		4/1/07	5/1/07	6/1/07	12/1/07	CEQA/NEPA complete
11				LAKE FOREST: Installation of 400 Catch Basin Filters	\$116,150		3/1/07	6/1/07	6/1/07	6/1/08	CEQA/NEPA 1/2006-6/2006 Project costs based upon \$300
12	Water Quality / Habitat Restoration	County of Orange / IRWM Region	Arrundo Removal	Non-native Arrundo donax removal along creeks	\$13,450,000		6/1/06	5/31/10	6/1/08	5/31/10	CEQA/NEPA 9/1/05-3/1/06
13	Water Quality / Pollution Reduction	Dana Point	DOHENY BEACH SOURCE INVESTIGATION & TREATMENT/ IMPLEMENTATION STUDY (includes DP as lead, SJC, LN, LH, MV, RSM, OCFCD)	Conduct concurrent microbial source tracking and epidemiology analyses and assessment in the San Juan Creek Watershed.	\$2,500,000		7/1/06	9/1/07	9/1/07	9/1/08	
14a	Water Conservation	MWDOC	Water Use Efficiency Expansion - Phase II	Phase II - Expand rebate program for weather-based irrigation technology (ET Controllers)	\$6,936,551	4,000	9/3/10	9/3/10	9/2/11	6/1/12	
14b	Water Conservation	REGIONAL ACTION PROJECT	GreenBack Program - Phase II	Administered by MWDOC, includes region cities: Landscape renewal rebate program aimed at encouraging structural conversion of existing landscapes.	\$2,114,000	110	7/3/09	9/1/10	9/3/10	9/2/11	

Table 4.1-1 2005 IRWM Plan Priority A Projects – By Priority

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
15	Water Quality / Habitat Restoration	NGOs	Habitat Restoration Projects	Laguna Creek Restoration Project and other stream course habitat restoration projects selected through the Wetlands Recovery Project South Orange County Small Grants Workplan process.	\$51,000		7/1/06	1/1/09	6/1/06	1/1/10	CEQA/NEPA 1/1/06-1/1/08
16	Water Conservation	TCWD	Water Filter Backwash Water Recovery	Recover waste filter backwash that is currently wasted to the sewer; water would be treated and mixed back into the raw influent.	\$595,000	180	2/1/07	3/1/07	3/1/07	4/1/07	CEQA/NEPA 7/1/06-6/1/06
17	Water Supply	Santa Margarita Water District	South Orange County Emergency Storage Reservoirs Phase I Upper Chiquita Reservoir	Construction of off-stream emergency storage reservoir for potable water as component of South County reliability	\$40,150,000	6,180	7/1/06	12/1/07	7/1/07	ongoing	CEQA/NEPA 1/1/04-6/1/06
18	Water Quality/ Habitat Restoration	Mission Viejo	English Creek Aquatic Restoration Study and Implementation Project	Aquatic restoration study to identify alternatives to reestablish a stable, healthy, and sustainable ecosystem/watershed environment through the use of structural and non-structural approaches.	\$2,853,215		7/1/06	7/1/08	7/1/08	7/1/09	CEQA/NEPA 12/1/05-2/1/06
19	Information	San Juan Basin Authority	San Juan Basin GIS	Develop hydrogeologic database, including land use and property ownership, aerial photography, and water quality data, to be utilized as a watershed planning and analysis tool.	\$121,200		n/a	n/a	7/1/06	11/1/06	
20	Aquatic Ecosystems & Watershed Management	San Juan Basin Authority	Environmental Monitoring	Bio-hydro monitoring of connectivity/flow between the surface and groundwater flow regimes to enhance the development and management of groundwater.	\$343,400		n/a	n/a	1/1/07	12/1/08	
Total Priority A Projects					\$176,313,851	27,545					

Table 4.1-2 2005 IRWM Plan Priority A Projects – By Water Management Strategy

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
2	Water Supply	Santa Margarita Water District	Gobernadora Multipurpose Basin	Construction of storm detention basin that will be established as a wetland/riparian habitat to treat urban runoff and storm flows.	\$10,050,000	725	7/1/06	7/1/07	7/1/07	continuous monitoring	CEQA/NEPA 1/2004-6/2006
4	Water Supply	ETWD, IRWD, & MNWD	Joint Recycled Water Treatment and Distribution	Water Recycling Facility and Distribution	\$13,790,900	3,000	5/1/07	7/1/08	6/1/08	ongoing	CEQA/NEPA 2/1/05-6/1/06
6	Water Supply	San Clemente	Recycled Water Treatment and Distribution	Expansion of the City's reclamation treatment and distribution systems.	\$14,112,000	2,900	10/1/07	12/1/08	12/1/08	ongoing	10/1/05 - 6/1/06; Possible Categorical Exemption or Negative Declaration
9	Water Supply	SCWD	Water Harvesting on Aliso Creek	Utilizes Mobile Urban Runoff Filtration technology to intercept and treat contaminated urban runoff and produce a high purity recycled water product	\$627,000		8/1/2006	10/1/2006	11/1/2006	11/1/2007	CEQA/NEPA 12/1/05-3/1/06
5a	Water Supply	SOCWA	J.B. Latham Treatment Plant - Advanced Water Treatment Project	Final design and construction of 11 MGD advanced water treatment facility at J.B. Latham Treatment Plant	\$15,654,760	5,000	7/1/06	7/1/07	7/1/07	continuous monitoring	CEQA/NEPA 07/01/05-6/1/06
5b	Water Supply	San Juan Capistrano	Recycled Water Transmission System Improvements	The San Juan Capistrano Recycled Water Transmission System Improvements Project will construct transmission mains and a recycled water reservoir as the next phase of improvements to the recycled water system.	\$20,843,000	4,000	10/1/06	1/1/08	1/1/08	1/1/09	Posted Negative Declaration 6/25/01, State Clearing House 8/2001
17	Water Supply	Santa Margarita Water District	South Orange County Emergency Storage Reservoirs Phase I Upper Chiquita Reservoir	Construction of off-stream emergency storage reservoirs for potable water as component of South County reliability	\$40,150,000	6,180	7/1/06	12/1/07	7/1/07	ongoing	CEQA/NEPA 1/1/04-6/1/06
Total Water Supply					\$115,227,660						
1a	Water Conservation	MWDOC	Water Efficiency Program Expansion - Phase I	Phase I: Expand rebate program for weather-based irrigation technology (ET Controllers).	\$2,020,000	1,000	10/1/06	3/1/09	1/1/06	6/1/09	
1b	Water Conservation	REGIONAL ACTION PROJECT	GreenBack Program - Phase I	Administered by MWDOC, includes region cities: Landscape renewal rebate program aimed at encouraging structural conversion of existing landscapes.	\$876,000	50	12/1/07	3/1/09	12/1/07	3/1/09	CEQA/NEPA Complete

Table 4.1-2 2005 IRWM Plan Priority A Projects – By Water Management Strategy

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
10	Water Conservation	REGIONAL ACTION PROJECT	DRPP - Demand Runoff & Pollution Prevention	Encourages structural conversion of existing landscape features that have a high impact on urban runoff quantity/quality and water demand		400					
10			\$8,080,135	SAN JUAN CAPISTRANO: Marco Forester Middle School Soccer Fields	\$1,124,510		3/1/06	10/1/06	n/a	n/a	CEQA/NEPA 11/1/04-2/1/05
10				LAGUNA NIGUEL: Synthetic Grass at Bear Brand Park Soccer Field	\$1,124,510		7/6/05	9/1/06	10/1/06	3/1/07	CEQA/NEPA 1/2006 - 4/2006
10				LAGUNA NIGUEL: Crown Valley Parkway Median Improvements	\$505,891		7/7/07	7/1/08	3/1/08	6/1/08	CEQA/NEPA 3/7/06-6/30/06
10				MISSION VIEJO: Marguerite Parkway Median & Slope Improvements	\$1,475,944		7/6/05	7/1/08	7/1/08	7/1/09	Based upon \$7/sq. ft. conversion costs.
10				MISSION VIEJO: Trabuco Road Median Improvements	\$573,712		7/6/05	7/1/08	7/1/08	7/1/09	Based upon \$7/sq. ft. conversion costs.
10				LAGUNA WOODS: El Toro Median Landscaping Update, Moulton to Paseo de Valencia	\$177,616		7/1/06	11/1/06	11/1/06	3/1/07	CEQA/NEPA Complete
10				LAGUNA WOODS: El Toro Median Landscaping update, Calle Sonora to Moulton	\$83,840		11/1/06	3/1/07	3/1/07	7/1/07	CEQA/NEPA 7/1/05 - 8/1/05
10				LAGUNA WOODS: Moulton Parkway Median Landscaping Improvements, Santa Maria to Southern City Limit	\$1,294,990		6/1/07	7/1/08	7/1/08	12/1/08	CEQA/NEPA 7/1/05 - 11/1/05
10				LAGUNA HILLS: Oso Parkway Median Landscaping Improvements	\$1,071,483		3/1/07	9/1/07	9/1/07	1/1/08	Based upon \$7/sq. ft. conversion costs.
10				LAGUNA HILLS: Moulton Parkway Median Landscaping Improvements	\$647,639		3/1/07	9/1/08	9/1/08	12/1/08	Based upon \$7/sq. ft. conversion costs.
14a	Water Conservation	MWDOC	Water Use Efficiency Expansion - Phase II	Phase II - Expand rebate program for weather-based irrigation technology (ET Controllers)	\$6,936,551	4,000	9/3/10	9/3/10	9/2/11	6/1/12	
14b	Water Conservation	REGIONAL ACTION PROJECT	GreenBack Program - Phase II	Administered by MWDOC, includes region cities: Landscape renewal rebate program aimed at encouraging structural conversion of existing landscapes.	\$2,114,000	110	7/3/09	9/1/10	9/3/10	9/2/11	
16	Water Conservation	TCWD	Water Filter Backwash Water Recovery	Recover waste filter backwash that is currently wasted to the sewer; water would be treated and mixed back into the raw influent.	\$595,000	180	2/1/07	3/1/07	3/1/07	4/1/07	CEQA/NEPA 7/1/06-6/1/06
Total Water Conservation					\$20,621,686						

Table 4.1-2 2005 IRWM Plan Priority A Projects – By Water Management Strategy

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
7	Water Quality / Habitat Restoration	Aliso Viejo	Wood Canyon Emergent Wetland Project	Construction of emergent wetland to enhance habitat, support functions/values, improve water quality, and mitigate channel incision, degradation, and flooding.	\$204,000		10/1/06	11/1/06	11/1/06	11/1/09	CEQA/NEPA: Completed
8	Water Quality / Habitat Restoration	County of Orange/ SOCWA/MNWD	Aliso Creek Mainstem Ecosystem Restoration and ACES	Stream restoration, stabilization, and replacement/relocation of utility lines in the Aliso Creek from upstream of the SOCWA bridge to Pacific Park Dr.	\$15,010,000		7/1/07	7/1/09	7/1/09	7/1/10	CEQA/NEPA 12/1/05-6/1/06
3	Water Quality / Pollution Reduction	Laguna Beach	Heisler Park Marine Habitat Protection	Construction of multi-beneficial water quality improvements to protect the adjacent Heisler ASBS.	\$1,616,000		12/1/06	5/1/07	5/1/07	12/1/07	CEQA/NEPA 6/1/04-6/1/05
11	Water Quality / Pollution Reduction	REGIONAL ACTION PROJECT	CURE - Cleaning Urban Runoff Efficiently	Cleaning Urban Runoff Effectively: Pollution Treatment and Trash & Debris Controls for Impaired Waterbodies							
11				ALISO VIEJO: Dairy Fork Trash Removal & Wetland Treatment	\$262,750		8/1/07	11/1/07	11/1/07	11/1/11	CEQA/NEPA 7/1/06-7/1/07
11				RANCHO SANTA MARGARITA: Treatment Vaults in 2 Locations	\$332,100		3/1/07	6/1/07	n/a	n/a	CEQA/NEPA Complete by 7/1/06
11				<i>current action due to ASBS status</i> LAGUNA BEACH: Urban runoff diversion and storm water filter systems at 5 beach priority storm drain outlet locations at Bluebird, Laguna Ave., Gaviota, Mountain Ave., and West St.	\$961,400		4/1/07	5/1/07	6/1/07	12/1/07	CEQA/NEPA complete
11				MISSION VIEJO: Installation of Treatment Vault at end of 81-inch pipe, J01P03	\$181,510		7/1/06	7/1/07	7/1/07	9/1/07	CEQA/NEPA 1/2005-2/2006
11				SAN JUAN CAPISTRANO: Update grease control BMPs at grandfathered restaurants	\$301,200		7/1/06	9/1/07	n/a	n/a	CEQA/NEPA N/A
11				SAN JUAN CAPISTRANO: Retrofit streamside horse stables with surface & subsurface BMPs	\$935,080		10/1/06	10/1/08	n/a	n/a	
11				COUNTY AND CITIES: Installation of Catch Basin Debris Screens (~900)	\$1,139,500		7/1/06	7/1/09	7/1/08	10.1.09	
11				DANA POINT: 150 Catch Basin Filter Upgrades	\$45,500		7/1/06	7/1/08	7/1/08	7/1/09	Project costs based upon \$300 per filter.
11				LAGUNA BEACH: Catch Basin Filter Retrofits at 20 Locations	\$40,500		4/1/07	5/1/07	6/1/07	12/1/07	CEQA/NEPA complete
11				LAKE FOREST: Installation of 400 Catch Basin Filters	\$116,150		3/1/07	6/1/07	6/1/07	6/1/08	CEQA/NEPA 1/2006-6/2006 Project costs based upon \$300
12	Water Quality / Habitat Restoration	County of Orange / IRWM Region	Arrundo Removal	Non-native Arundo donax removal along creeks	\$13,450,000		6/1/06	5/31/10	6/1/08	5/31/10	CEQA/NEPA 9/1/05-3/1/06
13	Water Quality / Pollution Reduction	Dana Point	DOHENY BEACH SOURCE INVESTIGATION & TREATMENT/ IMPLEMENTATION STUDY (includes DP as lead, SJC, LN, LH, MV, RSM, OCFCD)	Conduct concurrent microbial source tracking and epidemiology analyses and assessment in the San Juan Creek Watershed.	\$2,500,000		7/1/06	9/1/07	9/1/07	9/1/08	

Table 4.1-2 2005 IRWM Plan Priority A Projects – By Water Management Strategy

Priority	Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
							Start	End	Start	End	
15	Water Quality / Habitat Restoration	NGOs	Habitat Restoration Projects	Laguna Creek Restoration Project and other stream course habitat restoration projects selected through the Wetlands Recovery Project South Orange County Small	\$51,000		7/1/06	1/1/09	6/1/06	1/1/10	CEQA/NEPA 1/1/06-1/1/08
18	Water Quality/ Habitat Restoration	Mission Viejo	English Creek Aquatic Restoration Study and Implementation Project	Aquatic restoration study to identify alternatives to reestablish a stable, healthy, and sustainable ecosystem/watershed environment through the use of structural and non-structural approaches.	\$2,853,215		7/1/06	7/1/08	7/1/08	7/1/09	CEQA/NEPA 12/1/05-2/1/06
Total Water Quality / Habitat Restoration					\$39,999,905						
20	Aquatic Ecosystems & Watershed Management	San Juan Basin Authority	Environmental Monitoring	Bio-hydro monitoring of connectivity/flow between the surface and groundwater flow regimes to enhance the development and management of groundwater.	\$343,400		n/a	n/a	1/1/07	12/1/08	
19	Information	San Juan Basin Authority	San Juan Basin GIS	Develop hydrogeologic database, including land use and property ownership, aerial photography, and water quality data, to be utilized as a watershed planning and analysis tool.	\$121,200		n/a	n/a	7/1/06	11/1/06	
Total Priority A Projects					\$176,313,851	27,545					

4.2 Priority B Projects and Programs

Priority B projects were determined based on the following criteria:

- Project anticipated implemented by 2030.
- Future phases of certain highest-priority Regional Action Projects that are anticipated to extend beyond the short-term.
- Planning and feasibility projects that have not yet produced a defined capital improvement goal, but will contribute to meeting objectives within the 20-year planning horizon.
- Ongoing educational, management or non-structural projects and programs that contribute to the implementation of strategies in order to meet Plan objectives.

Priority B projects are listed and prioritized in Tables 4.2-1 and 4.2-2, by Priority and Water Management Strategies respectively. The tables also show the project timeframe for implementation. The IRWM Group will continue to evaluate regional priorities and modify the Priority B Projects list appropriately.

Table 4.2-1 2005 IRWM Plan Priority B Projects – By Priority

Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
						Start	End	Start	End	
Other	SOCWA	SOCWA/OCSD Enclosed Biosolids Composting Facility	Construct enclosed biosolids and greenwaste composting facility at the Prima Deshecha Landfill	\$32,009,515		9/1/07	7/1/09	2/1/09	continuous	CEQA/NEPA 10/1/05-11/1/06
Education	Laguna Niguel	Orange Coast Watershed Center	The Orange Coast Watershed Center will fill the regional need for a venue offering practical public education in the stewardship of watershed, energy and material resources.	\$3,500,000		7/1/09	6/1/10	7/1/10	7/1/12	Design and Bid 7/2008-6/2009
Sewage and Flood Management	Laguna Beach / SOCWA	North Coast Interceptor Repair Project	Sewage treatment improvement	\$1,150,000		7/1/05	6/1/06			CEQA/NEPA Complete
Water Supply	Santa Margarita Water District / MWDOC	South OC Emergency Storage Reservoirs- Phase II	Construction of reservoirs as component to South County Reliability	\$1,400,000	6,180					CEQA/NEPA to be completed 6/5/2005
Water Supply	San Clemente	Well No 8	Installation of new well	\$1,000,000	800					CEQA/NEPA completed 5/1/2005
Water Supply	San Juan Capistrano	San Juan Basin Recharge	Recharge San Juan Basin at maximum rate on approx. 25 acres	\$23,400,000	7,500	3/1/08	6/1/09	9/1/09	9/1/12	CEQA/NEPA 6/1/06-12/1/06
Water Quality / Habitat Restoration	Rancho Santa Margarita	CURE: Stormwater treatment Vault, Avenida Empressa Creek	Install treatment system for wet and dry weather flows	\$117,800		8/1/06	10/1/06	n/a	n/a	CEQA/NEPA to be completed 7/1/2006
Water Quality / Pollution Reduction	San Clemente	San Clemente Watershed Pollutant Source Investigation	Identify sources of pollutants and identify pilot projects to improve water quality	\$500,000		n/a	n/a	n/a	n/a	CEQA/NEPA 7/1/2006-7/1/2006
Water Quality / Habitat Restoration	Aliso Viejo	Canyon Vista Emergent Wetland Project	Construction of wetland to enhance habitat, support functions/values, improve water quality, mitigate channel incision, flooding	\$678,000						CEQA/NEPA Complete
Sewage and Flood Management	Laguna Beach	Canyon Acres Storm Drain Project	Construct storm drain and diversion junction	\$1,350,000		9/1/05	12/1/05			CEQA/NEPA Complete
Sewage and Flood Management	Laguna Beach	Atlantic Way Storm Drain Project	Install subdrain pipe, surface culvert stabilize existing policy	\$325,000		9/1/05	12/1/05			CEQA/NEPA Complete
Water Supply	San Juan Basin Authority	Galivan Basin Desalter	Divert Oso surface water to small desalter to be built at MNWD	\$10,000,000	3,000	7/1/07	4/1/08			Design 7/2006-4/2007
Water Conservation	Laguna Beach	Laguna Canyon Creek Restoration Project	The proposed project will complete the detailed planning, environmental documents and construction to restore about 5,500 lineal feet of the creek.	\$3,600,000		5/1/08	12/1/08	12/1/08	5/1/13	CEQA/NEPA 4/1/07-12/1/08
Water Supply	San Juan Capistrano	Well No 5 and Cooks Wells Development	Develop 3 non-domestic wells in San Juan Basin, rehabilitate well no. 5	\$3,800,000	1,000	12/1/06	10/1/07	n/a	n/a	Mitigated negative Declaration 10/1999
Water Supply	Trabuco Canyon Water District	Reclaimed Water	Reclaimed water system expansion	\$2,800,000	700					CEQA/NEPA completed 1/1/2005
Water Supply	San Clemente	Segunda Deshesha Urban Runoff Water Quality Project	Installation of UV treatment system to improve water quality of urban runoff	\$1,500,000	n/a/					
Water Supply	Trabuco Canyon Water District	Groundwater Treatment Plant	Surface and groundwater protection	\$3,000,000	500					CEQA/NEPA to be completed 5/1/2006
Other	TCWD	Water Treatment Plant Security	Security and Surveillance	\$100,000						
Water Conservation	Dana Point	Xeriscape Demonstration Garden at Harry Otsubo Community Garden	Revegetation of approximately 700 square feet of the Harry Otsubo Community Garden to plant a demonstration xeriscape garden.	\$8,000		7/1/06	9/1/06			
Water Quality / Habitat Restoration	Laguna Beach / Laguna Beach County Water District	Laguna Creek Intg. Coastal Watershed Management Plan	Develop plan to protect Laguna Creek Watershed, improve groundwater, runoff, restore habitat	\$400,000						
Water Supply	San Juan Capistrano	Low Flow Capture, Diversion Treatment - San Juan Trabuco Creeks	Capture and treat urban runoff at 10 main storm outlets, low flow diversions into sanitary sewer, water brought to SOCWA recycled water plant	\$2,230,000	150	4/1/07	4/1/08	5/1/08	12/1/08	CEQA/NEPA to be completed 8/1/2006
Water Conservation	Laguna Beach	Bluebird Creek Restoration Project	Study and develop plans and infrastructure	\$1,950,000		5/1/08	12/1/08	12/1/08	5/1/13	CEQA/NEPA 4/1/07-12/1/07

Table 4.2-1 2005 IRWM Plan Priority B Projects – By Priority

Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
						Start	End	Start	End	
Sewage and Flood Management	Laguna Beach	Shaw's Cove Sewage Lift Station	Sewer system improvement	\$751,000						
Water Quality / Habitat Restoration	San Juan Capistrano	San Juan Basin Inactive Well Inventory and Abandonment	Includes locating and inventorying inactive agricultural wells, as identified in the San Juan Basin Groundwater Management and Facility Plan, for the purposes of properly deconstructing and abandoning the wells.	\$675,000		3/1/2008	12/1/2008			CEQA/NEPA 6/1/06-12/1/06
Water Supply	El Toro Water District	Water Transmission Line Crossing Protection	Protect critical and venerable 18" and 24" potable water transmission pipelines	\$150,000		7/1/2006	9/1/2006			CEQA/NEPA 10/2005-6/2006
Sewage and Flood Management	San Juan Capistrano	La Novia Bridge Demolition and Reconstruction	Construct new, longer, higher and wider bridge to handle storm flows							
Water Supply	Dana Point	Salt Creek Treatment Plant	Water Recycling Facility	\$3,000,000	85	12/1/06	12/1/07	1/1/08	3/1/08	CEQA/NEPA to be completed 6/1/2006
Water Supply	Moulton Niguel Water District	MNWD Phase 5 Recycled Water Distribution System Expansion	Proposes Phase 5 of its recycled water distribution system, which will expand the distribution lines to deliver up to 1,400 acre-feet per year of recycled water to 272 existing landscape irrigation services.	\$14,056,000		1/1/12	12/1/24	12/1/14		CEQA/NEPA 3/1/11-9/1/11
Water Conservation	San Juan Capistrano	Native Planting Master Plan	Inventory of planted areas in the City, and develop a Master Plan for converting these areas to low water use native plantings.	tbd						
Water Quality / Habitat Restoration	Aliso Viejo	Storm Drain Bacterial Mitigation Project	CURE: Will improve water quality by mitigating bacterial loading, which flows into Aliso Creek, and impaired water body.	tbd						
Water Quality / Habitat Restoration	Laguna Hills	Oso Parkway Open Space Project	CURE: Conversion of portions of 39 acres of low value landscaping and weeds to high value upland and wetland riparian habitats.	tbd						
Water Quality / Habitat Restoration	Laguna Hills	La Paz Open Space Project	CURE: Conversion of portions of 36 acres of low value landscaping and weeds to high value upland and wetland riparian habitats.							
Water Quality / Habitat Restoration	Starr Ranch Sanctuary	Bell Canyon Riparian Enhancement Project	Proposes a riparian enhancement project that focuses on the removal of exotic plant species (particularly Vinca major) along the riparian corridor of Bell Canyon within Starr Ranch, followed by enhancement of the native vegetation.	\$281,000		n/a	n/a	5/1/08	4/1/12	Project Design to Completion 5/1/2007-4/31/2012
Water Quality / Pollution Reduction	Dana Point	San Juan Creek Nuisance Water Diversions	CURE: Final design and construction of a total of eight diversions within the Dana Point Harbor and the San Juan Creek Watershed within the City of Dana Point.	\$7,500,000		8/1/09	1/1/15	1/1/10	1/1/16	
Water Quality / Pollution Reduction	County of Orange	Laguna Niguel Regional Park Irrigation System Retrofit	CURE: Retrofit to reclaimed water with BMPs	\$100,000	40					
Water Quality / Pollution Reduction	Laguna Niguel	Divert Pool Deck Drainage to Sewer	CURE: Divert pool deck drainage to sewer at Crown Valley Parkway	\$30,000						
Water Supply	County of Orange	Water Harvesting and Re-Use at Laguna Niguel Regional Park	Investigate the feasibility of harvesting urban runoff water from storm drains along Sulphur Creek, and using the water for landscape irrigation at Laguna Niguel Regional Park.	\$290,000		2/1/09	6/1/09	7/1/09	6/1/11	CEQA/NEPA 7/2007-7/2008

Table 4.2-1 2005 IRWM Plan Priority B Projects – By Priority

Water Management Strategy	Implementing Agency	Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
						Start	End	Start	End	
Water Supply	MWDOC	Ocean Desalination Investigation at Dana Point	Pilot project for ocean desalination; pursuing funding in Proposition 50, Chapter 6.	tbd						
Water Supply	MWDOC	Water Transfers for Supply Reliability	Water transfer arrangements; pursuing funding in Proposition 50, Chapter 7.	tbd						
Water Supply	MWDOC	Local Water Recycling Projects	Water recycling projects; pursuing funding in Proposition 50, Chapter 7.	tbd						
Total Priority B Projects				\$121,651,315	19,955					

Table 4.2-2 2005 IRWM Plan Priority B Projects – By Water Management Strategy

Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
				Start	End	Start	End	
South OC Emergency Storage Reservoirs- Phase II	Construction of reservoirs as component to South County Reliability	\$1,400,000	6,180					CEQA/NEPA to be completed 6/5/2005
Well No 8	Installation of new well	\$1,000,000	800					CEQA/NEPA completed 5/1/2005
San Juan Basin Recharge	Recharge San Juan Basin at maximum rate on approx. 25 acres	\$23,400,000	7,500	3/1/08	6/1/09	9/1/09	9/1/12	CEQA/NEPA 6/1/06-12/1/06
Galivan Basin Desalter	Divert Oso surface water to small desalter to be built at MNWD	\$10,000,000	3,000	7/1/07	4/1/08			Design 7/2006-4/2007
Well No 5 and Cooks Wells Development	Develop 3 non-domestic wells in San Juan Basin, rehabilitate well no. 5	\$3,800,000	1,000	12/1/06	10/1/07	n/a	n/a	Mitigated negative Declaration 10/1999
Reclaimed Water	Reclaimed water system expansion	\$2,800,000	700					CEQA/NEPA completed 1/1/2005
Segunda Deshesha Urban Runoff Water Quality Project	Installation of UV treatment system to improve water quality of urban runoff	\$1,500,000	n/a/					
Groundwater Treatment Plant	Surface and groundwater protection	\$3,000,000	500					CEQA/NEPA to be completed 5/1/2006
Low Flow Capture, Diversion Treatment - San Juan Trabuco Creeks	Capture and treat urban runoff at 10 main storm outlets, low flow diversions into sanitary sewer, water brought to SOCWA recycled water plant	\$2,230,000	150	4/1/07	4/1/08	5/1/08	12/1/08	CEQA/NEPA to be completed 8/1/2006
Water Transmission Line Crossing Protection	Protect critical and venerable 18" and 24" potable water transmission pipelines	\$150,000		7/1/2006	9/1/2006			CEQA/NEPA 10/2005-6/2006
Salt Creek Treatment Plant	Water Recycling Facility	\$3,000,000	85	12/1/06	12/1/07	1/1/08	3/1/08	CEQA/NEPA to be completed 6/1/2006
MNWD Phase 5 Recycled Water Distribution System Expansion	Proposes Phase 5 of its recycled water distribution system, which will expand the distribution lines to deliver up to 1,400 acre-feet per year of recycled water to 272 existing landscape irrigation services.	\$14,056,000		1/1/12	12/1/24	12/1/14		CEQA/NEPA 3/1/11-9/1/11
Water Harvesting and Re-Use at Laguna Niguel Regional Park	Investigate the feasibility of harvesting urban runoff water from storm drains along Sulphur Creek, and using the water for landscape irrigation at Laguna Niguel Regional Park.	\$290,000		2/1/09	6/1/09	7/1/09	6/1/11	CEQA/NEPA 7/2007-7/2008
Ocean Desalination Investigation at Dana Point	Pilot project for ocean desalination; pursuing funding in Proposition 50, Chapter 6.		tbd					
Water Transfers for Supply Reliability	Water transfer arrangements; pursuing funding in Proposition 50, Chapter 7.		tbd					
Local Water Recycling Projects	Water recycling projects; pursuing funding in Proposition 50, Chapter 7.		tbd					
Total Water Supply		\$66,626,000	19,915					

Table 4.2-2 2005 IRWM Plan Priority B Projects – By Water Management Strategy

Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
				Start	End	Start	End	
Laguna Canyon Creek Restoration Project	The proposed project will complete the detailed planning, environmental documents and construction to restore about 5,500 lineal feet of the creek.	\$3,600,000		5/1/08	12/1/08	12/1/08	5/1/13	CEQA/NEPA 4/1/07-12/1/08
Xeriscape Demonstration Garden at Harry Otsubo Community Garden	Revegetation of approximately 700 square feet of the Harry Otsubo Community Garden to plant a demonstration xeriscape garden.	\$8,000		7/1/06	9/1/06			
Bluebird Creek Restoration Project	Study and develop plans and infrastructure	\$1,950,000		5/1/08	12/1/08	12/1/08	5/1/13	CEQA/NEPA 4/1/07-12/1/07
Native Planting Master Plan	Inventory of planted areas in the City, and develop a Master Plan for converting these areas to low water use native plantings.	tbd						
Total Water Conservation		\$5,558,000						
San Clemente Watershed Pollutant Source Investigation	Identify sources of pollutants and identify pilot projects to improve water quality	\$500,000		n/a	n/a	n/a	n/a	CEQA/NEPA 7/1/2006-7/1/2006
San Juan Creek Nuisance Water Diversions	CURE: Final design and construction of a total of eight diversions within the Dana Point Harbor and the San Juan Creek Watershed within the City of Dana Point.	\$7,500,000		8/1/09	1/1/15	1/1/10	1/1/16	
Laguna Niguel Regional Park Irrigation System Retrofit	CURE: Retrofit to reclaimed water with BMPs	\$100,000	40					
Divert Pool Deck Drainage to Sewer	CURE: Divert pool deck drainage to sewer at Crown Valley Parkway	\$30,000						
CURE: Stormwater treatment Vault, Avenida Empressa Creek	Install treatment system for wet and dry weather flows	\$117,800		8/1/06	10/1/06	n/a	n/a	CEQA/NEPA to be completed 7/1/2006
Canyon Vista Emergent Wetland Project	Construction of wetland to enhance habitat, support functions/values, improve water quality, mitigate channel incision, flooding	\$678,000						CEQA/NEPA Complete
Laguna Creek Intg. Coastal Watershed Management Plan	Develop plan to protect Laguna Creek Watershed, improve groundwater, runoff, restore habitat	\$400,000						
San Juan Basin Inactive Well Inventory and Abandonment	Includes locating and inventorying inactive agricultural wells, as identified in the San Juan Basin Groundwater Management and Facility Plan, for the purposes of properly deconstructing and abandoning the wells.	\$675,000		3/1/2008	12/1/2008			CEQA/NEPA 6/1/06-12/1/06

Table 4.2-2 2005 IRWM Plan Priority B Projects – By Water Management Strategy

Project Title	Project Description	Total Project Cost	Yield (AF)	Construction		Post Implementation, Construction, and Monitoring Efforts		NOTES
				Start	End	Start	End	
Storm Drain Bacterial Mitigation Project	CURE: Will improve water quality by mitigating bacterial loading, which flows into Aliso Creek, and impaired water body.	tbd						
Oso Parkway Open Space Project	CURE: Conversion of portions of 39 acres of low value landscaping and weeds to high value upland and wetland riparian habitats.	tbd						
La Paz Open Space Project	CURE: Conversion of portions of 36 acres of low value landscaping and weeds to high value upland and wetland riparian habitats.							
Bell Canyon Riparian Enhancement Project	Proposes a riparian enhancement project that focuses on the removal of exotic plant species (particularly Vinca major) along the riparian corridor of Bell Canyon within Starr Ranch, followed by enhancement of the native vegetation.	\$281,000		n/a	n/a	5/1/08	4/1/12	Project Design to Completion 5/1/2007-4/31/2012
Total Water Quality / Habitat Restoration		\$10,281,800	40					
North Coast Interceptor Repair Project	Sewage treatment improvement	\$1,150,000		7/1/05	6/1/06			CEQA/NEPA Complete
Canyon Acres Storm Drain Project	Construct storm drain and diversion junction	\$1,350,000		9/1/05	12/1/05			CEQA/NEPA Complete
Atlantic Way Storm Drain Project	Install subdrain pipe, surface culvert stabilize existing policy	\$325,000		9/1/05	12/1/05			CEQA/NEPA Complete
Shaw's Cove Sewage Lift Station	Sewer system improvement	\$751,000						
La Novia Bridge Demolition and Reconstruction	Construct new, longer, higher and wider bridge to handle storm flows	tbd						
Total Sewage and Flood Management		\$3,576,000						
Orange Coast Watershed Center	The Orange Coast Watershed Center will fill the regional need for a venue offering practical public education in the stewardship of watershed, energy and material resources.	\$3,500,000		7/1/09	6/1/10	7/1/10	7/1/12	Design and Bid 7/2008-6/2009
SOCWA/OCSD Enclosed Biosolids Composting Facility	Construct enclosed biosolids and greenwaste composting facility at the Prima Deshecha Landfill	\$32,009,515		9/1/07	7/1/09	2/1/09	continuous	CEQA/NEPA 10/1/05-11/1/06
Water Treatment Plant Security	Security and Surveillance	\$100,000						
Total Priority B Projects		\$121,651,315	19,955					

4.3 Contribution to Statewide Priorities

The SWRCB and DWR established Statewide Priorities that include the following:

- Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues.
- Implementation of Total Maximum Daily Loads that are established or under development.
- Implementation of Regional Water Quality Control Board Watershed Management Initiative Chapters, plans and policies.
- Implementation of the SWRCB's Nonpoint Source Pollution Plan.
- Assist in meeting Delta Water Quality Objectives.

Efforts to meet Statewide Priorities and improve water quality conditions have been underway in the Region for many years, and have continually advanced as new technologies and resources have become available. In 2003, the County of Orange's Drainage Area Management Plan was expanded to include watershed chapters, which were constructed cooperatively with the NPDES stormwater permittees in each watershed. Annual watershed updates are also prepared. The 2003-04 reports are currently available for six of the Region's watersheds. A sample of other activities within the watersheds that support the priorities identified by the State include:

- Installation of nuisance water diversions with continuous deflective separation (CDS) storm drains by the City of Laguna Beach;
- Creation of the Poche Beach Clean Beach Initiative, for which the County of Orange and the City of San Clemente have partnered to install and operate an ultraviolet disinfection system where the flood control channel empties onto Poche Beach - testing from July 2004 indicates the device removes approximately 70% of bacteria entering the system;
- Creation of the Sulphur Solution, a program begun by the Cities of Laguna Hills and Laguna Niguel to promote low-impact native vegetation; and
- Implementation of the City of Dana Point drain inlet filter program, covering all municipal storm drain inlets, and corresponding testing, which demonstrates effectiveness in removing heavy metals, organic and inorganic materials.

4.4 Modification of Regional Priorities in Response to Regional Changes

Change is anticipated within the Region due to evolving considerations, issues, and planning efforts. No plan, as with this IRWM Plan, should be static. Instead, the IRWM Plan is considered a living planning document and is flexible to adapt to change.

Given the high levels of interaction involved in the drafting and implementation of other regional plans in South Orange County, local agencies and groups have become skilled at coordinating responses to regional concerns, and as a result are well prepared to modify priorities as needed within the IRWM Plan. In addition to the IRWM Group coordination format, member agencies also interact at Watershed Stakeholder meetings and various related task forces and workgroups, such as MWDOC's Water Use Efficiency Workgroup. Through these established and intersecting networks, members of the IRWM Group have extensive access to information and one another, solidifying their ability to collectively respond to regional changes.

The IRWM Group members will bring issues, concerns, changes, and activities to scheduled IRWM Plan meetings. Each meeting will include an agenda item specifically for the discussion and opportunity to collectively hear, understand and respond to points of concern, issues, and amendments. This will allow the effective refinement of regional priorities, as needed, for the benefit of the region and its individual stakeholders. In this manner, all stakeholders to the IRWM Plan will be afforded the opportunity for input to amend the Plan.

Plan amendments are anticipated periodically in part to allow for immediate response to priority modifications and at least a full update of the Plan at least once every five years.

4.5 Project Monitoring and Performance Plan

Each implemented project in the IRWM Plan will include a Project Monitoring and Performance Plan and a Quality Assurance Project Plan where water quality monitoring is performed. The Performance Plan will address how the project will result in measurable improvements in water supply, water quality, watershed condition, capacity for effective watershed management, and other measurable benefits.

In addition to State-compatible data measurements, individual projects will establish other indicators of success as applicable. The following list shows the methods of project monitoring and performance measuring that are either already being implemented within the Region or will be implemented with the IRWM Plan:

- Increased community awareness and participation
- Increased watershed partnerships
- Improved water quality measurements
- Acres of wetland restored
- Feet of stream channel stabilization
- Photo documentation

Each Project Monitoring and Performance Plan will meet the following:

- (1) Identifies the baseline water quantity available to the water supplier, and/or characterizes the baseline water quality of the water body impacted.
- (3) Describes the manner in which the proposed activities are implemented (if applicable).
- (4) Determines the effectiveness of the water or watershed restoration or management activities in increasing water supply, preventing or reducing pollution, improved water quality, conserving water, providing public access, or other water management strategies.
- (5) For stream restoration, environmental and habitat protection and improvement, wetlands enhancement and creation projects, and other similar projects, determines, to the extent feasible, the changes in the pattern of flow in affected streams, including reduction of flood flows and increases in spring, summer, and fall flows that result from the implementation of the project.
- (6) Determines, to the extent feasible, the economic benefits resulting from changes determined pursuant to paragraph (4) or (5) above.
- (7) Other project-appropriate environmental monitoring that will provide data important to the accumulation of information regarding the status of the Bay-Delta system as a whole.

Much of the data that currently exists for the various projects is included in existing local and regional plans, documents, and programs identified in Table 5.1-1 in Chapter 5.

4.6 Data Management

As projects within the Plan come to fruition, monitoring and information management will be implemented. To ensure data consistency and quality assurance, two activities will be employed, as consistent with the SWRCB: quality control and quality assessment. Quality control assures that adequate sampling and technical activities are employed. Quality assessment refers to the process of quantifying the effectiveness of the quality control procedures.

To establish quality assurance, the Region will implement techniques compatible with State programs such as the California Environmental Resources Evaluation System (CERES), the California Environmental Data Exchange Network (CEDEN), the Surface Water Ambient Monitoring Program (SWAMP), and the Groundwater Ambient Monitoring and Assessment (GAMA) Program.

In doing so, the environmental analyses produced from each of the Region agencies can be made available and valuable for a variety of uses. Individual projects will also include a Project Monitoring and Performance Plan in their respective documentation.

There are specific types of monitoring that are currently being implemented throughout the region. With the exception of SWAMP, the following list represents the existing monitoring efforts. The projects proposed in this plan will follow the following existing and proposed monitoring methods:

- **Water Quality Monitoring:** For those projects designed to improve the physical quality of water, water sampling is expected to be performed in a manner compatible with State prescribed methods. A Quality Assurance Project Plan may also be required for such projects.
- **Ambient Water Quality Monitoring:** Monitoring data will follow the SWAMP data reporting requirements.
- **Load Reduction Monitoring:** those projects that include the removal of pollutants from water bodies will generate an annual estimate of load reductions achieved as a part of the project.
- **Stream and Wetland Monitoring:** projects that include protection or restoration of streams, shorelines, or wetlands will include an annual accounting of the acreage of wetlands restored, feet of streambank and shoreline protected, and feet of stream channel stabilized as appropriate.
- **Photo-Monitoring:** projects that include restoration or construction activities will include photographic documentation done in accordance with the guidelines produced by the SWRCB.

Data acquisition and sharing will be accomplished through coordination among local agencies and stakeholder groups. This will further assist project proponents in monitoring and data management. Once information is developed and available for dissemination, the public and general stakeholders will be able to access specific data on the County's watershed web site: www.ocwatersheds.com. Information will be posted in lay terms so that the general public will be able to gain an understanding about and support activities within the Region. Other monitoring websites will be identified and utilized as appropriate during implementation of the Plan.

The following provides an overview of the State information and data exchange programs, including CERES, CEDEN, SWAMP and GAMA:

CERES: The California Environmental Resources Evaluation System (CERES) is an information system developed by the California Resources Agency to facilitate access to a variety of electronic data describing California's rich and diverse environments. The goal of CERES is to improve environmental analysis and planning by integrating natural and cultural resource information from multiple contributors and by making it available and useful to a wide variety of users.

CERES collects and integrates data and information and distributes it via the World Wide Web, tapping into important information sources and contributing to advances in the science of data management and metadata cataloging by encouraging cooperation among governmental, educational, and private groups.

CERES focuses on three related components: technology, data, and community. The first, *technology*, includes the development of new software and network structures to accommodate the search and retrieval, organization, and accessibility demands associated with huge volumes of data in a wide range of forms. The second, *data*, encompasses the

conversion of vast quantities of information into digital form as well as the evaluation of existing digital data sets and the development of metadata catalogs required searching and data-quality and appropriate use assessment. The third, *community*, contains CERES' efforts to promote the use of the network for planning and policy and to foster the growth of new users and contributors in a far-reaching web of affiliations.

CERES also coordinates focused applications to support well-defined natural resource management activities and to supply the public with critical and timely information.

CERES' Web links that have been developed include:

- » Environmental Education
- » Environmental Law
- » Land Use Planning Information Network
- » Watershed Information Technical System
- » California Wetlands Information System
- » The California Environmental Information Catalog
- » California Environmental Keyword Thesaurus

Data standards are central to the exchange of information between CERES partners. Some data are exchanged by manually transferring them into a shared system. Other data are exchanged using machine to machine transfers. CERES has identified multiple websites and standards to be useful for coordinated data sharing, including the California Environmental Information Catalog (CEIC). CEIC is CERES own online directory for reporting and discovery of information resources for California. Potential partnerships for information exchange utilizing this system include cities, counties, utilities, state and federal agencies, private businesses, and academic institutions that have spatial and other types of data resources. CEIC is based on the Federal Geographic Data Committee (FGDC) metadata standard. Contributors may enter data into the catalog via a convenient web interface, or with a batch process by exporting the data to an XML file made available to CEIC over the Internet.

CEDEN: The California Environmental Data Exchange Network (CEDEN) is another of CERES' identified websites for coordinated data sharing. CEDEN is a growing statewide cooperative data exchange program of various groups involved in the water and environmental resources of the State of California. Most of CEDEN's data exchange services are custom developed using a robust tool set which has been used to connect scores of programs into the network. Multiple projects are underway to extend CEDEN data exchange to additional standards and those services should be available in the coming year. The Surface Waters Ambient Monitoring Program (SWAMP) describe the standards used for these services, as well as the Environmental Data Standards Council (EDSC), which uses standards to establish data exchanges with the CalEPA node of the US EPA National Environmental Information Exchange Network.

SWAMP: The Surface Water Ambient Monitoring Program (SWAMP) was proposed to integrate existing water quality monitoring activities of the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB), and to coordinate with other monitoring programs.

SWAMP is a statewide ambient monitoring effort designed to assess the conditions of surface waters throughout the state of California. Responsibility for implementation of monitoring activities resides with the nine RWQCB's that have jurisdiction over their specific geographical areas of the state. Ambient monitoring refers to any activity in which information about the status of the physical, chemical and biological characteristics of the environment is collected to answer specific questions about the status, and trends in those characteristics. For the purposes of SWAMP, ambient monitoring refers to these activities as they relate to the characteristics of water quality.

SWAMP also hopes to capture monitoring information collected under other State and Regional Board Programs such as the State's TMDL (Total Maximum Daily Load), Nonpoint Source, and Watershed Project Support programs. SWAMP does not conduct effluent or discharge monitoring which is covered under National Pollutant Discharge Elimination System permits and Waste Discharge Requirements. In addition, local project implementation and reported water quality results will also provide additional monitoring information for the SWAMP.

Monitoring and assessment of ambient water quality and beneficial uses is necessary in order to:

- (a) Identify and characterize water quality and beneficial use problems and threats;
- (b) Identify trends in water quality and beneficial uses;
- (c) Determine whether water quality standards are met;
- (d) Evaluate the uniqueness or pervasiveness of problems;
- (e) Evaluate the severity of problems;
- (f) Make decisions about which problems and which locations should be prioritized for action; and
- (g) Make decisions about what actions should be taken.

In accordance with Clean Water Act section 305(b), the SWRCB and RWQCBs periodically compile an inventory of the state's major waters and the water quality condition of those waters, using monitoring data and other pertinent information. This inventory is known as the Water Quality Assessment. The Water Quality Assessment is the foundation upon which the TMDL Program is built, although continues to be inadequately funded.

To enhance the need for more extensive and more thorough monitoring and assessment of the waters of the San Diego region, monitoring and assessment, for both status and trends, needs to be planned, ongoing, and continuous. The San Diego RWQCB intends to use SWAMP resources so as to ensure that monitoring is conducted in each hydrologic unit once in every five-year period. Although all hydrologic units will be monitored, current funding will enable only cursory monitoring and assessment to be done. The San Diego RWQCB planned to locate monitoring sites on main stem rivers and streams, just above tidal influence; main

stem rivers and streams just above the confluence with major tributaries, and major tributaries just above the confluence with the main stem rivers and streams.

In the San Juan Watershed, nine monitoring stations are included in the following:

» Aliso Creek	1	» Bell Canyon Creek	1
» San Juan Creek	2	» Laguna Canyon Creek	1
» Arroyo Trabuco	1	» Moro Canyon Creek	1
» Oso Creek	1	» English Creek	1

Ambient monitoring is not and does not need to be conducted only by SWRCB / RWQCB staff. Academic and other research groups, dischargers, and other stakeholders all have a role in monitoring and assessment. Therefore, the South Orange County IRWM Group will assist in meeting the goals of the Water Quality Assessment Program and the SWAMP by providing water quality data to the State's programs. This additional level of monitoring information will be conducted in a useful and coordinated manner to the State to enable sharing of information and avoid duplicative monitoring. The State's monitoring coordination program, initiated in July 2004, will assist in identifying regulatory and non-regulatory monitoring efforts in the San Diego Region and to coordinate the SWAMP monitoring efforts with these programs.

GAMA: The primary objective of the Groundwater Ambient Monitoring and Assessment (GAMA) Program is to comprehensively assess statewide groundwater quality and gain an understanding about contamination risk to specific groundwater resources. The primary goal of the Comprehensive Groundwater Quality Monitoring Program is to:

1. Improve comprehensive groundwater monitoring and,
2. Increase the availability of groundwater quality information to the public.

To facilitate a statewide, comprehensive groundwater quality-monitoring and assessment program most efficiently, uniform and consistent study-design and data-collection protocols are being applied to the entire state. The GAMA Program monitors groundwater for a broad suite of chemicals at very low detection limits, including exotic chemicals such as wastewater chemicals and pharmaceuticals. Monitoring and assessments for priority groundwater basins are to be completed every ten years, with trend monitoring every three years. The SWRCB is collaborating with the U.S. Geological Survey (USGS) and Lawrence Livermore National Laboratory (LLNL) to implement the GAMA Program.

Stewardship of the state's groundwater resources is the shared responsibility of all levels of the government and community. A key aspect of GAMA is interagency collaboration, data sharing, and communication with local water agencies. While the GAMA Program remains voluntary, the Program provides several benefits to federal, state, local, and community participants:

- Improves comprehensive statewide groundwater monitoring;
- Increases the availability of groundwater quality information to the public;
- Provides a mechanism to unite local, regional, and statewide groundwater programs in a common effort to understand and manage groundwater resources effectively;

- Facilitates interagency communication and data-sharing between federal, state, and neighboring local agencies;
- Improves understanding of local, regional, and statewide hydrogeology, as well as groundwater quality issues and concerns;
- Provides groundwater data to establish baseline conditions and early warning of potential water quality concerns;
- Provides agencies with knowledge of groundwater trends and long term forecasting in groundwater quality; which is important for groundwater management plan growth and preparation;
- Provides agencies with better information to respond to concerns of consumers and consumer advocate groups;
- Helps inter-basin agencies that have basin-wide or regional groundwater management objectives; and
- Creates a database with access to groundwater quality data and provides tools to aid in completing groundwater assessments.

The GAMA Program has two sampling components: the California Aquifer Susceptibility (CAS) Assessment which addresses public supply drinking water wells and the Voluntary Domestic Well Assessment Project which addresses private drinking water wells. The CAS assessment utilizes low-level VOCs and age-dating analyses to assist in the evaluation of the hydrogeologic conditions within the groundwater basin/subbasin. The GAMA Program is also focused on an effort to identify and centralize the many sources of groundwater data and information available in the state. As part of this effort, the SWRCB has joined with other groundwater agencies to form a Groundwater Resources Information Sharing Team. The various groundwater data sets will be made accessible to the public and interested agencies within a Groundwater Resources Information Database.

Various groundwater monitoring and assessment programs collect a significant amount of groundwater-related data in various coverage and formats. Data in different electronic formats may not be as valuable as a single database of information. The lack of data comparability and sufficient data sharing significantly hampers oversight of groundwater resources.

Identification of measures that would increase coordination among state and federal agencies that collect groundwater contamination information would be beneficial. Coordination is essential for the success of a Comprehensive Groundwater Quality Monitoring Program. Increased coordination will also benefit all agencies through data sharing, training costs, and project responsibilities. The emphasis should be on increasing collaboration to effectively expand existing programs to cover a wider range of sampling, analyses, and evaluation efforts. The following measures will result in increased basic interagency coordination and communication on groundwater programs:

- » Share data (e.g., GIS Coverages);
- » Share data collection responsibilities;
- » Develop minimum sampling and analytical protocols;
- » Share specialized training;

- » Collaborate on data interpretation;
- » Share laboratory facilities and share information on laboratory methods;
- » Continue the ITF to ensure interagency coordination / communication;
- » Meet on a periodic basis to achieve these listed elements; and
- » Develop a standardized data format for electronic submittal of groundwater monitoring data.

The GAMA program recognized the value of public supply wells used in a monitoring network to assess groundwater that is used for drinking water purposes. By enhancing the analytical information already collected by the local purveyors, GAMA further analyzes for low-level VOCs and age-dating in order to assist in assessing the hydrogeology in areas that are vulnerable to surface contamination as well as be an early warning indicator of impacts. The GAMA program has already begun to assess these high priority areas.

Just as state agency data are being incorporated into a comprehensive database, local groundwater quality data may also assist in basin/subbasin and larger scale assessments. It is anticipated that the amount of local data is significant in some basins/subbasins. Partnerships and effective coordination with the local agencies will be an important part of the Comprehensive Groundwater Quality Monitoring Program. Thus, projects implemented as part of the South Orange County IRWM Plan that result in information beneficial to the GAMA Program will coordinate with the state to provide useful data.

CHAPTER 5 COORDINATION WITH EXISTING LOCAL/REGIONAL PLANS

5.1 IRWM Projects and Linkage to Local/Regional Plans

Each of the IRWM Group members plan and execute both short-term capital improvement programs and long-term plans and management programs. It is their plans, reports, studies and programs along with certain regional plans, documents and programs provide the foundation for the IRWM Plan and present a coordinated, integrated approach.

Many existing plans, including Master Plans, Facility Plans, Watershed Management Plans, recycled water studies, feasibility studies, and long-range plans, contain proposed projects that are instrumental in meeting the goals and objectives of the Region in addition to individual goals and objectives. Many projects within local and regional plans and studies have been incorporated into the IRWM Plan, and will continue to be implemented in coordination with those plans. Table 5.1-1, Existing Local and Regional Plans, Documents, and Programs, demonstrates the multitude of plans and projects that the South Orange County IRWM Plan integrates into regional planning.

Table 5.1-1 Existing Local and Regional Plans, Documents and Programs

Document Title	Author	Agency	Date
Aliso Creek Watershed Management Plan	U.S. Army Corps of Engineers	County of Orange	9/01
Aliso Creek Watershed Management Study	U.S. Army Corps of Engineers	County of Orange	9/01
Basin Water Levels and Well Yield	Geotechnical Consultants	San Juan Capistrano, City of	11/01
Bikeways, Trails & Open Space Master Plan	Dangermond Group	Laguna Hills, City of	11/01
Biosolids Management Strategic Plan	Tetra Tech, Inc.	SOCWA	9/02
CVWD and MNWD SERRA AWT and Pipeline Project	Cathcart Garcia Von Langen Engineers	Moulton Niguel WD	7/94
Determining the Value of Water Supply Reliability	Orange County Business Council	MWDOC	8/03
Drainage Area Management Plan	Co-Permittees	County of Orange	2003
Drinking Water Source Assessment	Geotechnical Consultants	San Juan Capistrano, City of	3/01
Enclosed Composting Facility	SOCWA	SOCWA	10/02

Document Title	Author	Agency	Date
ETWD, IRWD, and MNWD Recycled Water Project Study Draft	Tetra Tech	Moulton Niguel WD	12/2003
Evaluation of Recycled Water Supply for MNWD & ETWD	Cathcart Garcia Von Langen Engineers	Moulton Niguel WD	4/01
General Plan and Draft Environmental Impact Report for Doheny State Beach	Department of State Parks	Dana Point, City of	12/03
General Plan/Local Coastal Program "Open Space and Conservation" Element	City of Laguna Beach	Laguna Beach, City of	2004
Groundwater Supply and Management Study	Boyle Engineering Corporation	San Clemente, City of	09/87
Heisler Park Preservation and Renovation Conceptual Plan	SFC Consultants	Laguna Beach, City of	07/04
Heisler Park Preservation and Renovation EIR	SFC Consultants	Laguna Beach, City of	12/04
Identification of Regional BMP Retrofitting Opportunities Draft (Stormwater Program)	RBF Consulting	County of Orange	04/04
Jay Latham Wastewater Treatment Plant Preliminary Design Report	Cathcart Garcia Von Langen Engineers	SOCWA	09/00
Joint Regional Water Supply System Master Plan	AKM Consulting Engineers	South Coast WD	02/97
Laguna Coastal Streams Watershed Management Plan	Co-Permittees	Laguna Beach, City of	2004
Laguna Creek Initial Study and Conceptual Restoration Plan	PCR Services Corporation	Laguna Beach, City of	10/03
Local Implementation Plan (Jurisdictional Urban Runoff Management Plan)	Co-Permittees	All cities	2003
Long Range Plan Update	Moulton Niguel WD	Moulton Niguel WD	2/02
MNWD Master Plan for District-wide Facilities	Moulton Niguel WD	Moulton Niguel WD	1996
Natural Community Conservation Plan	County of Orange	County of Orange	1996
Non-Domestic Water Master Plan Financial Study	City of San Juan Capistrano	San Juan Capistrano, City of	04/00
Ocean Desalination Plant Feasibility Study	Boyle Engineering Corporation	MWDOC	1/03
Planned Utilization of Water Resources in the San Juan Creek Basin Area	DWR	DWR	06/72

South Orange County IRWM Plan

Document Title	Author	Agency	Date
Preliminary Design of MNWD Recycled Water System Expansion with ETWD	Cathcart Garcia Von Langen Engineers	Moulton Niguel WD	8/02
Preliminary Engineering MNWD AWMA-Side Water Reclamation Distribution System	Nolte and Assoc.	Moulton Niguel WD	6/88
Preliminary Engineering MNWD SERRA-Side Water Reclamation Distribution System	Nolte and Assoc.	Moulton Niguel WD	6/89
Preliminary Well Design and Site Selection Report	Geotechnical Consultants	San Juan Capistrano, City of	6/01
Reclaimed Water Master Plan	AKM Consulting Engineers	San Clemente, City of	04/94
Regional Urban Water Management Plan Update	MWDOC	MWDOC	2000
San Juan Basin Groundwater Management and Facilities Plan	NBS Lowry	San Juan Basin Authority / MWD	05/94
San Juan Creek Watershed Management Plan	U.S. Army Corps of Engineers	County of Orange	09/02
San Juan Creek Watershed Management Study	U.S. Army Corps of Engineers	County of Orange	09/02
Sanitary Sewer Master Plan	Tetra Tech	San Juan Capistrano, City of	2003
Santa Ana Integrated Watershed Plan	SAWPA	SAWPA	6/02
Selection of Recommended Projects for San Juan Basin Groundwater Management	SJBA	SJBA	05/95
Seven-Year Drought Groundwater Flow Model Results	Geotechnical Consultants	San Juan Capistrano, City of	6/02
Sewer Collection Strategic Plan and Capital Improvements Program	City of Laguna Beach	Laguna Beach, City of	07/02
South Orange County Water Reliability Study (Phase 1&2)	Boyle Engineering Corporation / MWDOC	MWDOC	01 & 04
Special Area Management Plan	U.S. Army Corps of Engineers	County of Orange	2004
Southern California Comprehensive Water Reclamation and Reuse Study	CH2MHILL; U.S. Bureau of Reclamation	U.S. Bureau of Reclamation and 8 partnering agencies	1999
Strategic Plan 2003-2008	South Coast WD	South Coast WD	11/03
Ten Year Capital Improvement Program 2002-2012	SOCWA	SOCWA	10/02

Document Title	Author	Agency	Date
Unified Annual Progress Report, Program Effectiveness San Diego Region	Co-Permittees	County of Orange	11/04
Urban Runoff Diversion Study Report	Willdan	Laguna Beach, City of	04/01
Urban Runoff Management Plan	City of Laguna Hills	Laguna Hills, City of	2/03
Urban Runoff Management Plan Draft	Brown and Caldwell	San Clemente, City of	2001
Urban Water Management Plan, 2000	El Toro WD	El Toro WD	12/00
Urban Water Management Plan, 2000	Irvine Ranch WD	Irvine Ranch WD	12/00
Urban Water Management Plan, 2000	Laguna Beach County WD	Laguna Beach County WD	12/00
Urban Water Management Plan, 2000	Moulton Niguel WD	Moulton Niguel WD	12/00
Urban Water Management Plan, 2000	City of San Clemente	San Clemente, City of	12/00
Urban Water Management Plan, 2000	Santa Margarita WD	Santa Margarita WD	12/00
Urban Water Management Plan, 2003	City of San Juan Capistrano	San Juan Capistrano, City of	10/03
Urban Water Management Plan, 2001	South Coast WD	South Coast WD	3/01
Urban Water Management Plan, 2000	Psomias	Trabuco Canyon WD	2000
Water and Sewer Master Plan	RBF Consulting	El Toro WD	12/04
Water Master Plan		San Clemente, City of	04/94
Water Master Plan Update	AKM Consulting Engineers	San Juan Capistrano, City of	3/04

In example, each watershed in the Region includes unique surface water and groundwater sources and are managed by Drainage Area Management Plan (DAMP). Therefore, by approaching the Region on a watershed basis, the availability of local water resources can be clearly outlined. To meet the requirements of Sections J and L of the municipal National Pollution Discharge Elimination System (NPDES) Stormwater Permits issued jointly to the cities within the County, the Orange County Flood Control District and the County of

Orange, watershed chapters have been developed for the County's DAMP, and are updated annually. The chapters and their respective updates are developed by the "Permittees" of each watershed. The Permittees are comprised of each city within the geographic boundaries of the watershed in addition to the County of Orange and the Orange County Flood Control District. The water supply and water quality of these sources is described below for each respective watershed. Appendix B includes more detailed information.

A clear representation of coordination with an existing plan is the Southern California Comprehensive Water Reclamation and Reuse Study. This 6-year study evaluated the feasibility of maximizing the beneficial uses of recycled water through regional collaborative programs. The Study covered a 6 county area in southern California, included over 7,300 demand points and all wastewater supplies in its data bases. The SCCWRRS was a partnership between the U.S. Bureau of Reclamation and eight cost sharing partners. Three phases of the study have been completed: compilation of data to analyze the optimum use of reclaimed water; development of preliminary designs and costs for specific projects; and identification of Priority A and Priority B projects. Many of the findings, recommendations, and proposed projects were considered within this IRWM Plan. The IRWM Plan will continue to be coordinated with this Study and other planning documents that already have studied and considered many of the key factors within the IRWM Plan.

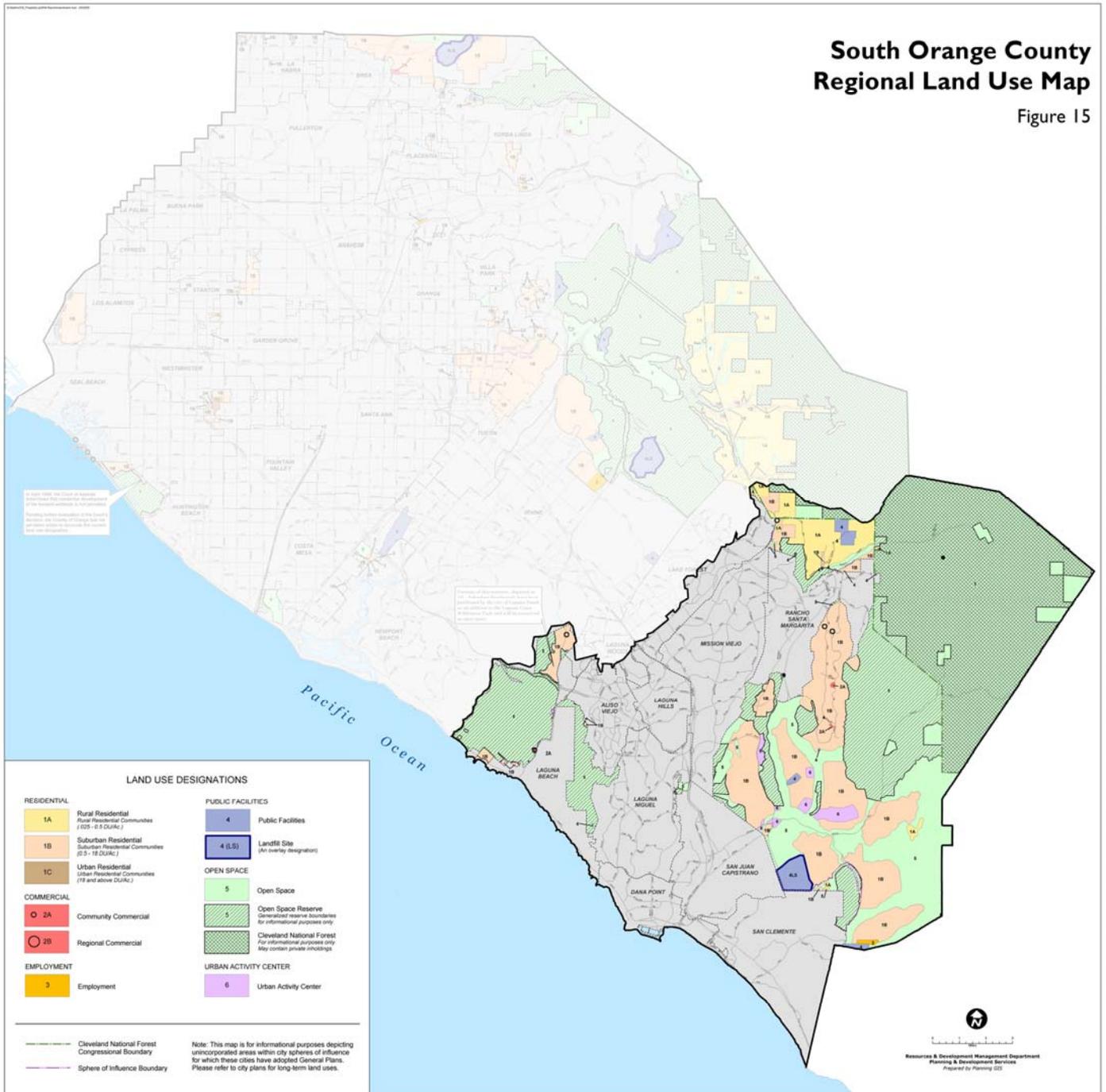
5.2 Coordination with Land-Use Plans

Local land use plans have assisted in the development of the IRWM Plan. In this way the IRWM Plan is consistent with and reflects projects that are linked to land use planning in the Region. Plans and information that have contributed to the IRWM Plan include city General Plans - Land Use Elements, Storm Water Elements, and Water/Wastewater Elements; County of Orange Land Use Planning documents; and Southern California Association of Governments (SCAG) land use data. The Orange County General Plan also played a major role in evaluating projects for consistency with planned land use. Figure 15 shows the South Orange County Regional Land Use Map, as included in the Orange County General Plan, General Plan Amendment (GPA) 04-02, which was approved October 14, 2004 and adopted with Resolution No. 04-291 by the Orange County Board of Supervisors on November 8, 2004.

Much of the land use data has assisted in the regional planning and projections of water demands, water use classifications, infrastructure water planning, and reliability planning into the future. The IRWM Plan will continue the essential link to local land use plans, and can be considered a planning document in return for many local land use plans.

South Orange County Regional Land Use Map

Figure 15



CHAPTER 6 GOVERNANCE

6.1 Plan Administration and Management

The County of Orange, Resources and Development Management Department, Watershed and Coastal Resources Division, will serve as the IRWM Plan administrator. Plan implementation will be in accordance with the proposed project priority and schedule, as periodically amended, by each project proponent.

The County of Orange will lead quarterly IRWM Plan meetings with the IRWM Group. Group members may expand or contract as appropriate from time to time. The quarterly meetings will focus on status of plan and project implementation; project funding; monitoring, data management and reporting, and review and consideration of regional priorities and necessary refinement. The County will be responsible for drafting and distributing meeting minutes to the IRWM Group members.

The Governance/Management Committee is composed of County, city and water/special district representatives. They will continue to meet, as determined appropriate, for the purpose of discussing IRWM Plan implementation and refinement issues, and to provide recommendations to the IRWM Group. The Governance/Management Committee has and will continue to perform strategic decision making, project recommendations, coordination of project implementation, and provide program advocacy. Activities of the Governance / Management Committee will facilitate focused and streamlined IRWM Group meetings.

The Executive Committee, composed of elected representatives from participating agencies, will oversee policy issues and budget decisions. They will meet on a semi-annual basis.

This three-layer method of administration will promote partnership opportunities between cities and special districts, as well as elected officials and non-elected representatives. It will also facilitate ongoing and meaningful public and private stakeholder involvement and group participation and decision making, while focusing on one administering agency for coordination and management. The administering agency will be accountable to the IRWM Group and outside funding sources that require regional applications and agreements.

Periodic amendments to the Project Priority List will be made to respond to and adjust for regional changes. The IRWM Plan will be updated no less than once every five years and will be accomplished in the IRWM Group environment affording the opportunity for input from all stakeholders. A public information meeting(s) will be held to ensure participation and input by the public and private stakeholders. The IRWM Plan Update is anticipated to begin in the fourth year of the plan, culminating with a complete update by the end of the fifth year.

6.2 Continuing Coordination with Local, Regional, and Statewide Plans

The IRWM Plan will continue to be coordinated with local, regional and statewide plans, as appropriate. As new studies and plans are completed, existing plans are amended or updated, and future plans are on the horizon, the IRWM Group will continue to monitor these changes, identify the linkage and coordination opportunities, and incorporate necessary amendments into the IRWM Plan.

In addition, the IRWM Plan will be provided to cities, the County, and water suppliers, wastewater agencies, and other planning agencies within the Region for use as a planning document in update of their General Plans, Strategic Plans, and other plans and programs. The IRWM Plan can also be essential information for consideration in development of future plans.

6.3 Continuing Coordination with Future Land Use Planning

Local land use plans will continue to assist in the development of the IRWM Plan. Amendments to the IRWM Plan and/or the Projects List will be consistent with and reflect a response to land use planning in the Region. The IRWM Group members will monitor land use efforts by the local and regional land use planning cities and agencies, and bring new and/or refined information to the IRWM Plan meetings. Documents may include city General Plans - Land Use Elements, Storm Water Elements, and Water/Wastewater Elements; County of Orange Land Use Planning documents; and Southern California Association of Governments (SCAG) land use data.

The IRWM Plan will continue the essential link to local land use plans for such data as regional planning and projections of water demands, water use classifications, infrastructure mater planning, and reliability planning into the future. The IRWM Plan may also be a planning document for many local land use plans. This process of dissemination of information demonstrates the continued coordination effort between the planning documents.

APPENDICES

**South Orange County
Integrated Regional Water Management Plan**

APPENDIX A

DESCRIPTIONS OF SAN JUAN HYDROLOGIC UNIT AND REGIONAL WATERSHEDS

San Juan Hydrologic Unit

The San Juan Hydrologic Unit is naturally divided by major water bodies.³² This hydrologic unit is located in southern Orange County, approximately 50 miles south of Los Angeles and 65 miles north of San Diego. The two major natural surface water bodies within the Unit are San Juan Creek and San Mateo Creek. The mouth of the San Juan Creek is normally open to the ocean. Usually, the water at the mouth of the creek is essentially the same as that of the adjacent coastal waters. The mouth of San Mateo Creek forms a salt water tidal marsh and is entirely within the Camp Pendleton Naval Reservation. The San Juan Hydrologic Unit is comprised of seven major watersheds located within Orange County and two major basins. The watersheds include the Newport Coast, Laguna Coastal Streams, Aliso Creek, Dana Point Coastal Streams (Salt Creek), San Juan Creek, San Clemente Coastal Streams, San Mateo Creek, and Newport Coast, while the basins include the San Juan Groundwater Basin and San Mateo Groundwater Basin.³³

Newport Coast Watershed

Most of the Newport Coast Watershed, which covers about 11 square miles, falls within RWQCB-Region 8 with a small southern portion falling within the jurisdiction of Region 9. The Newport Coast Watershed area extends along the Pacific coast south of Corona Del Mar in Newport Beach to just past Emerald Bay Channel in unincorporated Orange County. It is bordered on the north by the Newport Bay Watershed, on the northeast by the San Diego Creek Watershed, and contoured on the east and south by the Laguna Coastal Streams Watershed. All surface water in this coastal watershed drains to the Pacific Ocean via overland flow and stormdrain systems. The Newport Coast Watershed is comprised of nine small coastal channels (listed from north to south): Buck Gully Creek, Morning Canyon Channel, Pelican Point Creek, Pelican Point Middle Creek, Pelican Point Waterfall Creek, Los Trancos Creek, Muddy Canyon, Moro Canyon, and Emerald Bay Channel.

This watershed is shared by several jurisdictions. Most of this watershed was annexed by the City of Newport Beach in 2002, but the southernmost portion, beginning at Morro Canyon, is within Orange County's jurisdiction. Only the small portion included in Region 9 is part of the South OC region.

³² California Department of Water Resources. San Juan Valley Basin Description. 11/20/04 Online: http://www.groundwater.water.ca.gov/bulletin118/basin_desc/basins_m-r.cfm#gwb30htm

³³ County of Orange. Orange County Stormwater Program 2003 Drainage Area Management Plan (DAMP). Appendix D Watershed Chapters. 12/20/04. Online: http://www.ocwatersheds.com/StormWater/documents_damp_chapters.asp

Laguna Coastal Streams Watershed

The Laguna Coastal Streams Watershed consists of the Laguna Canyon Creek watershed and several smaller coastal-draining watersheds adjacent to it. Laguna Canyon Creek runs north to south, directly through the middle of its watershed, and ultimately discharges into the Pacific Ocean at Laguna Beach. The 11-square-mile watershed includes portions of the cities of Aliso Viejo, Laguna Beach, and Laguna Woods. Several other smaller watersheds, including Boat Canyon, Blue Bird Canyon, Rim Rock Canyon, and Hobo Canyon, also drain portions of these cities. This watershed is generally bounded by the eastern boundary of Emerald Canyon on its west and the western boundary of the Aliso Creek watershed on its east. The remaining undeveloped areas are largely within the Laguna Coast Wilderness Park and the Aliso and Wood Canyons Regional Park. The Laguna Coast Wilderness Park covers most of the western half of the Laguna Canyon Creek watershed, and a small portion of the Aliso and Wood Canyons Regional Park is included in the northeastern part of the watershed.

Region 9 has placed Laguna Coastal Streams under the Laguna subunit of the San Juan Hydrologic Basin (designated Hydrologic Sub Area 1.13). In addition to Laguna Canyon Creek, the Water Quality Control Plan also lists Boat Canyon, Laguna Canyon, Blue Bird Canyon, Rim Rock Canyon, and Hobo Canyon as receiving waters discharging to the Pacific Ocean as receiving waters. The receiving waters listed above offer several beneficial uses, including agricultural supply, non-contact and contact water recreation, warm freshwater habitats, and wildlife habitats.

Aliso Creek Watershed

The State Regional Water Quality Control Board, Region 9 has placed Aliso Creek under the Laguna subunit of the San Juan Hydrologic Basin (designated Hydrologic Sub Area 1.13). The Water Quality Control Plan (Basin Plan) also lists the English Canyon, Sulphur Creek, and Wood Canyon tributaries to Aliso Creek as receiving waters. The following existing beneficial uses are designated in the Basin Plan for the Aliso Creek watershed: agricultural supply; contact water recreation; non-contact water recreation; warm freshwater habitat; and wildlife habitat. The following designations apply to the mouth of Aliso Creek: contact water recreation; non-contact water recreation; wildlife habitat, rare, threatened, or endangered species; and marine habitat.

Dana Point Coastal Streams Watershed

The Dana Point Coastal Streams watershed is within the jurisdiction of Region 9. In addition to the primary Salt Creek, the Basin Plan also lists San Juan Canyon and Arroyo Salado as receiving waters. The following existing beneficial uses are designated in the Basin Plan for Salt Creek, San Juan Canyon, and Arroyo Salado: agricultural supply; non-contact water recreation; warm freshwater habitat; and wildlife habitat. The potential beneficial use of contact water recreation is also designated in the Basin Plan for Salt Creek, San Juan Canyon, and Arroyo Salado.

The following existing beneficial uses are designated in the Basin Plan for Dana Point Harbor: contact water recreation; non-contact water recreation; commercial and sport fishing; industrial service supply; marine habitat; migration of aquatic organisms; navigation; rare,

threatened or endangered species habitat; shellfish harvesting; spawning; reproduction and/or early development habitat; and wildlife habitat.

San Juan Creek Watershed

The San Juan Creek Watershed is located in southern Orange County, approximately 55 miles south of Los Angeles and 60 miles north of San Diego. A small western portion of the San Juan Creek Watershed extends into Riverside County. San Juan Creek drains a broad, fan-shaped, fairly steep watershed with much of its headwaters in the Cleveland National Forest and other public lands. The Creek ultimately discharges into the Pacific Ocean at Doheny Beach. The approximately 173-square-mile watershed includes portions of the cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, San Juan Capistrano and unincorporated areas within the County of Orange.³⁴ The Arroyo Trabuco and Oso Creeks are smaller tributaries.

The State Regional Water Quality Control Board, Region 9 has placed San Juan Creek under the Laguna subunit of the San Juan Hydrologic Basin. The Basin Plan also lists the San Juan Creek, Bell Canyon Creek, Cañada Gobernadora, Arroyo Trabuco (Trabuco Creek), and Oso Creek tributaries to San Juan Creek as receiving waters. The following existing beneficial uses are designated in the Basin Plan for San Juan Creek, Morrell Canyon, Decker Canyon, Long Canyon, Lion Canyon, Hot Spring Canyon, Cold Spring Canyon, Lucas Canyon, Aliso (not Creek) Canyon, Verdugo Canyon, Bell Canyon, Fox Canyon, Dove Canyon, Crow Canyon, Trampas Canyon, Cañada Gobernadora, Cañada Chiquita, Horno Creek, Trabuco (Arroyo Trabuco) Creek, Holy Jim Canyon, Falls Canyon, Rose Canyon, Hickey Canyon, Live Oak Canyon, Tijeras Canyon, Oso Creek, and La Paz Creek: agricultural supply; cold freshwater habitat; industrial; contact water recreation; non-contact water recreation; spawning habitat; warm freshwater habitat; and wildlife habitat. The following designations apply to the mouth of San Juan Creek: rare, threatened, or endangered species; non-contact water recreation; marine habitat; migratory habitat; shellfish habitat; and wildlife habitat.

Wildlife inhabitants of the area contribute significantly to the bacterial contamination.³⁵ Unfortunately, the presence of bacteria prevents full use of the watershed's environmental resources. In 1998, the lower reach of San Juan Creek was listed by Region 9 as water quality impaired in accordance with Section 303(d) of the Clean Water Act due to high levels of fecal indicator bacteria. Thus, in May 2000, the State Water Resources Control Board, through Region 9, provided funding to the County of Orange Public Facilities and Resources Department to perform a study in collaboration with the Orange County Health Care Agency of the existing bacterial contamination within the San Juan Creek watershed. Conclusions from this study are still being investigated.

San Clemente Coastal Streams Watershed

The San Clemente Coastal Streams Watershed is located in the southernmost part of Orange County, approximately 60 miles south of Los Angeles and 55 miles north of San Diego.

³⁴ California Department of Water Resources. Bulletin No. 104-7 - *Planned Utilization of Water Resources in the San Juan Creek Basin Area*. June 1972.

³⁵ Army Corps of Engineers, 2002, *San Juan Creek Feasibility Study*.

Prima Deshecha Canada is one of two main streams that flow through the City of San Clemente, ultimately discharging into the Pacific Ocean at Poche Beach. Several small, unnamed drainages, as well as a few larger tributaries, join Prima Deshecha as it makes its way through the watershed. The Prima Deshecha originates near the Prima Deshecha landfill and flows along Camino de los Mares, underneath the San Diego Freeway (Interstate 5) and N. El Camino Real, before discharging into the Pacific Ocean at Poche Beach. The Segunda Deshecha Canada, the second main stream draining the watershed, flows through the Talega development, along Avenida Pico, under the San Diego Freeway (Interstate 5) and N. El Camino Real, before discharging into the Pacific Ocean at North Beach. The 18-square-mile watershed is almost fully developed and includes parts of the cities of San Clemente, San Juan Capistrano and Dana Point.

Region 9 of the State Regional Water Quality Control Board has placed San Clemente Coastal Streams under the Orange County Coastal Streams subunit of the San Juan Hydrologic Basin. The Basin Plan lists Prima Deshecha Canada and Segunda Deshecha Canada as receiving waters. The following existing beneficial uses are designated in the Basin Plan for the receiving waters listed above: agricultural supply; contact water recreation; non-contact water recreation; warm freshwater habitat; and wildlife habitat.

San Mateo Creek Watershed

The portion of the San Mateo Creek Watershed within Orange County is largely unincorporated territory under the jurisdiction of the County of Orange, but includes parts of the City of San Clemente in its downstream-most area. The San Mateo Creek at the ocean has a watershed of 132 square miles. However, the portion of the watershed within Orange County covers about 20 square miles of southeastern Orange County. Most of San Mateo Creek and its outlet to the Pacific Ocean are actually located in San Diego County, but the upstream-most portion of the San Mateo Creek Watershed is located in Orange County. The Donna O'Neill Land Conservancy is located toward the southwestern side of the watershed at Rancho Mission Viejo. The portion of San Mateo Creek within Orange County flows through unincorporated Orange County before entering the City of San Clemente. It then re-enters San Diego County, ultimately discharging into the Pacific Ocean at San Onofre State Beach.

Region 9 of the State Regional Water Quality Control Board has placed San Mateo Creek under the Orange County Coastal Streams subunit of the San Juan Hydrologic Basin (designated Hydrologic Sub Area 1.40). The Basin Plan lists San Mateo Creek and its mouth as receiving waters. There are both existing and potential beneficial uses as described in the Basin Plan for the San Diego Basin (CSWRCB 1994). The following existing potential beneficial uses are designated in the Basin Plan for the receiving waters listed above: cold water habitat; rare species habitat; contact water recreation; non-contact water recreation; spawning habitat; warm water habitat; and wildlife habitat.

San Juan Groundwater Basin

The San Juan Groundwater Basin underlies the San Juan Creek Watershed and several tributary valleys in southern Orange County. The groundwater basin is bounded on the west by the Pacific Ocean and otherwise by Tertiary semi-permeable marine deposits. The groundwater basin is subdivided into three sub-basins: the upper, middle, and lower sub-basins. A structural constriction near the confluence of San Juan Creek and Canada Chiquita separates the upper and middle sub-basins. The middle sub-basin ends where the Inter-state 5 crosses San Juan Creek. The valley fill alluvium, including the three sub-basins, occupies approximately 11,700 acres.³⁶ A comprehensive Groundwater Management and Facility Plan for the San Juan Basin (NBS Lowery) was prepared in 1994.

San Juan Creek drains the San Juan Valley and several other creeks drain valleys tributary to the San Juan. Average annual precipitation ranges from 11 to 15 inches. Recharge of the basin is from flow in San Juan Creek, Oso Creek, and Arroyo Trabuco and precipitation to the valley floor. Water from springs flows directly from Hot Spring Canyon into San Juan Creek, adding to recharge.³⁷

San Mateo Groundwater Basin

This San Mateo Valley Groundwater basin underlies San Mateo Valley and Christianitos Canyon in southeastern Orange County and northwestern San Diego County. The basin is bounded by the Pacific Ocean on the west and elsewhere by semipermeable tertiary marine sedimentary rocks (Regional Water Quality Control Board, 1994). The valleys are drained westward to the ocean by San Mateo and Christianitos Creeks. Together, the watersheds of San Mateo and San Onofre Creeks are 175 square miles. The San Onofre Creek watershed is 43 square miles and the San Mateo Creek at the ocean has a watershed of 132 square miles. The Christianitos Creek watershed is a little over 31 square miles.³⁸

The Lower San Mateo Basin is a two-aquifer system, consisting of an upper unconfined aquifer and a deeper confined aquifer. The upper aquifer is divided into an overlying alluvium and the Upper San Mateo Formation Aquifer. The San Mateo formation is not present upstream of the Cristianitos fault where the alluvium is underlain by non-water bearing rocks. The confined aquifer, referred to as the Lower San Mateo Formation Aquifer, is separated from the upper aquifer by an aquitard. Modeling results indicate that the lower San Mateo Basin is in hydrological contact with the Lower San Onofre Basin, although the connection is weak.⁵⁵

Infiltration of surface water from Cristianitos and San Mateo Creeks provides most of the recharge to the aquifer. Direct precipitation and infiltration of treated wastewater also contribute to recharge.

³⁶ California Department of Water Resources. Bulletin No. 104-7 *Planned Utilization of Water Resources in the San Juan Creek Basin Area*. June 1972.

³⁷ California Department of Water Resources. San Juan Valley Basin Description. 11/20/04 Online: http://www.groundwater.water.ca.gov/bulletin118/basin_desc/basins_m-r.cfm#gwb30htm

³⁸ NBS/Lowry. *San Mateo and San Onofre Groundwater Basins, Camp Pendleton, Conjunctive Use Management Model*. November 1994.

APPENDIX B

WATER SUPPLY, WATER QUALITY, AND ECOLOGICAL PROCESSES OF REGIONAL WATERSHEDS

The Region's seven major watersheds include ecological processes that create environmental resources. Although ecological knowledge of the Region continues to be studied and explored, several beneficial uses of the Region's environmental resources have been identified for each of the seven major watersheds. Below is a brief summary of the Region's environmental and water resources for each watershed. See Appendix A for additional information on the watershed.

Newport Coast Watershed

The Newport Coast Watershed is shared by several jurisdictions. Most of this watershed was annexed by the City of Newport Beach in 2002, although the southernmost portion, beginning at Morro Canyon, is within the County of Orange's jurisdiction. The southern portion of the watershed is within Region 9 of the RWQCB boundary, while the northern portion is within Region 8 of the RWQCB boundary. **Only the southern portion is included in the South OC region.**

In the past few years, Newport Beach and other local entities have faced watershed problems involving streambed instability as exhibited by head-cutting and slope failures, the arrival of invasive plant species (*Arundo donax* and other exotic pest plant species), and the loss of native wetland and riparian habitat. Seven of the canyon streams now flow year round due to over irrigation in the upstream developments. It is suspected that the dry-weather flows carry bacteria, fertilizer, and pesticides through the canyon reaches and into the ocean.

Surface Water Supply

The RWQCB Region 9, in the southern portion of the watershed, has listed the following beneficial use designations: contact and non-contact water recreation. They are not currently used for potable sources.

Surface Water Quality

In recent years, the Newport Coast Watershed, like much of Orange County, has faced watershed problems involving streambed instability as exhibited by head-cutting and slope failures, the arrival of invasive plant species, and the loss of native wetland and riparian habitat. Seven of the canyon streams now flow year round due to over irrigation in the upstream developments. It is suspected that the dry-weather flows carry bacteria, fertilizer, and pesticides through the canyon reaches and into the ocean. These problems have become progressively worse and pose a threat to residences, the two near-shore marine refuge Areas of Special Biological Significance, Crystal Cove State Park, and the ecological function of the riparian corridors within the watershed. A piecemeal approach to dealing with these

problems has been ineffective due to the technical, jurisdictional and financial hurdles that must be simultaneously addressed.

Over the past 40 years, the Orange County Health Care Agency has been testing the coastal waters in Orange County for bacteria. As of 1999, new requirements for frequent testing of surfzone waters and stringent criteria for beach water closures went into effect as part of Assembly Bill 411. Samples from the watershed are collected weekly by the Health Care Agency from ten ocean, bay, and drainage locations.³⁹ The Irvine Company, Irvine Ranch Water District, Surfrider Foundation, and Orange County Coastkeeper have performed limited water quality sampling as well. The results of these sampling programs are currently being reviewed. Future monitoring programs are planned to be specifically geared toward providing information that can be used to develop programs to protect the two Areas of Special Biological Significance.⁴⁰

In accordance with the Clean Water Act, the Santa Ana Regional Board in 2002 placed Buck Gully Creek on the 303(d) list for total coliform and fecal coliform, and placed Los Trancos Creek on the 303(d) list for fecal coliform. The Orange County coastline, which runs along over five miles of the Newport Coast Watershed, is also listed for trash.

There has been a confluence of separate investigations and projects being carried out in the Newport Coast Watershed by the City of Newport Beach, the Irvine Company, the County of Orange, Irvine Ranch Water District, Orange County Coastkeeper, and the Surfrider Foundation. In order to address the destabilization and degradation of the watershed's coastal canyons in a systematic and effective manner, the City of Newport Beach's Public Works Department and City Manager's Water Quality Division have proposed the creation of a watershed program for the Newport Coast as an organizing tool for future activities in the watershed and were the lead in proposing for grant funding. As part of this watershed program, a monitoring program will specify biological indicators and metrics to assess and monitor ecosystem health relative to watershed function. Examples of applicable indicators might include biomass of native riparian wetland vegetation, habitat use by declining or sensitive species, attached fresh-water algae, aquatic macro-invertebrate diversity and distribution, and the health and diversity of intertidal and subtidal communities in the marine life refuges. Additional indicators will be selected in consultation with Regions 8 and 9, and the County of Orange. In addition, the watershed program will include a program for mapping the areas of *Arundo* and instituting a removal program.

Six objectives have been put forth by the Newport Coast Watershed Program:

- Complete the technical studies and prepare the watershed assessment report for the watershed management area;
- Implement a monitoring program for baseline data and ongoing monitoring to track changes in the watershed;
- Prepare a Watershed Management Plan that provides specific restoration recommendations for each of the coastal streams with attendant ecological benefits

³⁹ County of Orange, 2003, *Drainage Area Management Plan, Draft Newport Coast Watershed Chapter*.

⁴⁰ Newport Coast Watershed Program, 2004, *Draft Project Narrative*.

- for the intertidal and subtidal communities in the areas of special biological significance;
- Implement specific stabilization and restoration projects in Buck Gully and Morning Canyon within the framework of the Watershed Management Plan;
 - Provide educational opportunities for City staff, community members, and stakeholders in watershed science and management skills and enlist community support in monitoring and restoring the health of the watersheds and marine life refuges; and
 - Expand the scope of the watershed management program including researching funding opportunities for subsequent restoration projects as outlined by the Watershed Management Plan.⁴¹

Laguna Coastal Streams Watershed

The designation of Laguna Coastal Streams Watershed actually refers to a group of small sub-watersheds draining to the Pacific Ocean. The largest is the Laguna Canyon Creek. Smaller, sub-watersheds draining nearby include Boat Canyon, Blue Bird Canyon, Rim Rock Canyon and Hobo Canyon. The Laguna Coastal Streams Watershed is within the jurisdiction of the San Diego Regional Water Quality Control Board (Region 9).

Surface Water Supply

The following existing beneficial uses have been designated within the watershed by Region 9: agricultural supply, non-contact water recreation, warm freshwater habitat, and wildlife habitat. At this time, surface waters from the Laguna Coastal Streams Watershed are not used as a potable water supply. In a joint effort, the City of Laguna Beach and the Laguna Beach County Water District are planning to research the potential surface supply that may be used as a recycled water supply.

Surface Water Quality

Program management of various water quality improvement programs within the Laguna Coastal Streams Watershed occurs at two levels: activities conducted by the Watershed Permittees individually, and activities conducted in coordination with all Permittees and other stakeholders. A Watershed Management Framework is being established to implement watershed-scale activities and programs. Currently, the County of Orange is leading the transition to a new management group with active input from the watershed stakeholders. The group consists of the County, Laguna Beach, Laguna Woods, and Aliso Viejo. Given the strong implementation orientation of these groups, it is expected that members of the public may choose to participate on an advisory basis, or in sub-committees rather than as regular members of the group. Consideration of protection of environmental resources, and not only water quality issues, needs to be constantly integrated into future planning.⁴²

⁴¹ Newport Coast Watershed Program, 2004, *Draft Project Narrative*.

⁴² County of Orange, 2003, *Drainage Area Management Plan, Laguna Coastal Streams Watershed Chapter*.

The Orange County Health Care Agency conducts water quality testing at ocean and drainage locations in the watershed. Bacteria, trash, and copper are a high priority concern for the Watershed Permittees due to impacts on beaches downstream of the creek mouths. Other water quality testing is conducted on the Laguna Canyon Lakes by the County of Orange. Lake monitoring indicates that each of the lakes are highly eutrophic with high nutrient levels, low water transparency, continual algal blooms, and reduced dissolved oxygen toward the base of the water column. Sampling data suggest that urban runoff entering the lake system through Inlet 1 is contributing to the nutrient load. However, nutrient loading from other sources including atmospheric deposition, internal recycling, groundwater contributions, and stormwater flows may also be significant determinants of lake water quality. The possible significance of these other sources has not been quantified.

To protect the resources, the *Laguna Canyon Creek Habitat Restoration Project* was initiated. The City of Laguna Beach is evaluating the possibility of restoring approximately 4,000 linear feet of the Laguna Creek. Potential restoration activities may include the following: (1) removal of debris and trash, and development of a more natural channel configuration constructed of permeable, vegetation-holding materials; (2) re-grading of the site; and (3) revegetation of the corridor with native riparian species. The project is also intended to contain a public education component that integrates public outreach and education of outlying neighborhoods, as well as of visitors to the restoration site. The performance criteria include habitat expansion and quality.

The City of Laguna Beach also constructed a small wetlands restoration project that has incidental water quality improvement benefits, among them, water polishing and sediment and nutrient retention. Performance criteria include habitat expansion and quality.

In the 2003-2004 reporting period, the Watershed Chapter Committee, comprised of Permittee representatives, met twice to discuss local priority constituents of concern (copper), the effectiveness of distributing informational brochures, project design alternatives, and the use of inlet grates on catch basins.

Current activities being conducted within the watershed to improve water quality include:

- The completion of an initial study and restoration plan for Laguna Creek by the City of Laguna Beach.
- The City of Laguna Beach has begun project design for restoration of a portion of Laguna Creek identified in the study.
- The City of Laguna Woods is working with its Leisure World community to reduce irrigation runoff into Barbara's Lake (one of the Laguna Canyon Lakes).
- Completed construction of catch basin inserts with fossil fuel filters by the City of Laguna Woods.
- Completed construction of the Laguna Audubon Basin by the City of Aliso Viejo;
- The City of Laguna Woods completed the installation of catch basin inserts with fossil fuel filters at sub-watershed I02P13.

- Installation of nuisance water division with continuous deflective separation (CDS) storm drains by the City of Laguna Beach.⁴³
- The Santa Margarita Water District operates the Upper Oso Creek Barrier, which intercepts non-storm flow and urban return flow water in Oso Creek for reuse, and thereby protects downstream watersheds from degradation

Groundwater Supply

Two local water agencies serve the population residing in the Laguna Coastal Streams Watershed: the Laguna Beach County Water District (LBCWD) and the South Coast Water District. The Laguna Beach County Water District has annual adjudicated rights to 2,025 acre-feet of water in the Orange County Groundwater Basin. The District also maintains wells in the cities of Fountain Valley and Huntington Beach to extract the groundwater, though they are not currently used. However, the LBCWD does plan to resume pumping from the Orange County Groundwater Basin in the future, which will increase local supply and decrease its reliance on imported water.

The South Coast Water District (SCWD) has not historically used groundwater from any local basin, though it is planning for a groundwater recovery facility to treat brackish water from the San Juan Creek Groundwater Basin. The plant is scheduled to begin construction in June 2005, with a start up date of January 2007. Initial capacity will be 800 acre feet, but the District hopes to expand the facility up to 2,000 acre feet after acquiring the necessary water rights.

Groundwater Quality

The Orange County Groundwater Basin is currently recharged by streambed percolation, recycling programs, and imported water purchases. Orange County Water District (OCWD) monitors the quality of the Groundwater Basin extensively, testing for over 190 constituents including nitrate, salts, selenium, trichloroethylene, volatile organic compounds and radon to insure potable quality. OCWD is also planning a new Groundwater Replenishment System, scheduled to be on-line in 2007, which will take highly treated sewer water from the Orange County Sanitation District, and purify it using micro-filtration, reverse osmosis, and ultraviolet light and hydrogen peroxide before percolating it into the basin. Water produced by this system is expected to be so pure it will actually help to reduce the growing mineral-content in the basin, and will exceed all state and federal drinking water standards.⁴⁴

Groundwater in the San Juan Creek Basin, which the SCWD intends to utilize in the future, is currently high in total dissolved solids. Therefore the proposed groundwater recovery facility will treat the water prior to distribution. Similar to the outcome anticipated by the operational desalter project in San Juan Capistrano, groundwater recovery from the San Juan Creek Groundwater Basin is expected to improve overall groundwater quality, as extraction will increase the available storage space for percolation of better quality surface water.

⁴³ Orange County Stormwater Program, 2004, *Watershed Annual Report, Laguna Coastal Streams Watershed*.

⁴⁴ Orange County Water District, 2005, web: <http://www.ocwd.com/>

Extensive monitoring will also be performed by SCWD as well as the San Juan Basin Authority for quality assurances.

Aliso Creek Watershed

The Aliso Creek watershed encompasses an area just over 30 square miles in size. The terrain in the Aliso Creek watershed varies dramatically along the course of the creek. The headwaters begin in Cleveland National Forest in a rugged mountain environment, then enter a more level floodplain in the middle reaches, and continue through a narrow coastal canyon en route to its ocean outlet. While much of the upper and lower watershed is surrounded by reserved parkland, the middle reaches of the watershed are highly developed. Aliso Creek is the primary water course within the watershed, which also includes Sulphur Creek, English Canyon, and Wood Canyon.

Surface Water Supply

Surface waters within the Aliso Creek Watershed are not currently used as a potable supply. The South Coast Water District is pursuing a project to harvest surface water from Aliso Creek in the future, as described further in Chapter 4.

Surface Water Quality

Testing data on Aliso Creek surface waters indicates certain pollutant concentrations are high compared to RWQCB water quality objectives. Nineteen miles of Aliso Creek was listed as impaired for bacteria indicators, phosphorus, and toxicity on the 2002 303(d) list. A Bacteria TMDL is being prepared and is expected to be issued at the end of 2005.

Potential sources of surface water pollutants include discharges from industries, pesticides and other materials from residential and commercial areas, roadways and vehicle exhaust, and landscaping. High concentrations of ammonia and pesticides are likely from landscaping activities. High chloride, sulfate, total dissolved solids, and metals are usually associated with industrial areas and roadways. The increased bacterial levels may be attributed to living or decaying plants or animals, and fecal excrement from domestic pets or wildlife.

Another water quality issue is water and sediment quality in the near-shore coastal marine waters. Bacterial loading from Aliso Creek causes periodic beach postings as a result of direct runoff; however, there may be a continuing accumulation of bacteria in the near-shore sediments. These sediments are stirred and resuspended due to wave action and can re-release bacteria into the water column. A reduction in bacteria loading in the creek will likely reduce the sediment bacteria problem as well.⁴⁵

The Watershed Permittees are especially active in the Aliso Creek Watershed, which underwent a watershed planning process between 1997 and 2001, and has been subject to a RWQCB 13225 Directive since 2001. They meet separately from the countywide program on

⁴⁵ Army Corps of Engineers, 2001, *Aliso Creek Watershed Management Study*.

a regular basis to coordinate activities. Watershed Permittees and agency stakeholders have also held meetings for more than six years in an effort to better define issues and responsibilities that need to be addressed. An important component in the management process that is being developed has been participation from the public and representatives of environmental organizations, many of who attended a number of meetings in an effort to provide input.

As outlined in the Aliso Creek Watershed Management Plan, the watershed suffers from a number of problems related to water resources.⁴⁶ The identified problems are grouped in four general categories: creek instability, water quality, loss of fish and wildlife habitat, and flooding damages.

Watershed management has become necessary in order to decrease negative impacts of human activities and to increase the positive impacts. Economic resources are required to enable the community to address and solve resource problems such as nonpoint source pollution. Establishment of a goal-oriented management program can prevent problems before they occur and will result in less expensive and more efficient use of community energy. The Aliso Creek Mainstem Ecosystem restoration spin-off Study will begin in 2005.

The effort to attain this goal will include programs to reach several listed objectives of the plan. These objectives are measurable milestones that will enable the community to track progress toward maintaining a natural balance in watershed resources. Most of the objectives are to promote and encourage practices and behavior that supports development of a healthy environment for the watershed. Education is therefore a major component of this management program, as well as enhanced public outreach to promote a more complete understanding of the environmental problems and the ecological value of the Aliso Creek Watershed.

A long range Watershed Management Framework is being developed by stakeholders with the support of the Army Corps of Engineers 2001 Aliso Creek Management Study.⁴⁷ Additionally, the South Orange County Wastewater Authority (SOCWA) has agreed to participate in plans to improve the water quality in the Aliso Creek watershed. SOCWA is relocating their sewer/sludge lines to protect them from Aliso Creek floodwater erosion.

Current activities to improve water quality undertaken by the permittees include:

- Sulphur Creek Ecosystem Restoration
- Sulphur Solution, a program begun by the Cities of Laguna Hills and Laguna Niguel to promote low-impact native vegetation
- Development of plans for English Canyon ecosystem restoration, Wood Canyon Emergent Wetland Project, and Aliso Creek ecosystem restoration
- Continued monitoring and benefits from the Wetland Capture and Treatment Network constructed multipurpose wetlands completed by the City of Laguna Niguel in 2003

⁴⁶ County of Orange. Aliso Creek Watershed Plan. 12/20/04. Online: http://www.ocwatersheds.com/watersheds/alisocreek_watershed_management_toc.asp

⁴⁷ County of Orange, 2003, *Drainage Area Management Plan, Aliso Creek Watershed Chapter*.

- Aliso Beach Clean Beach Initiative Project, an ultra violet disinfection water quality treatment system installed at storm drain J01P28 that has been in operation since July 31, 2003 during dry weather
- Munger Storm Drain Pilot Sand Filter to treat water discharged from Munger Storm Drain into Aliso Creek⁴⁸

Groundwater Supply

According to the San Juan Groundwater Basin Plan Amendments (Nolte 1993), the neighboring Aliso Creek watershed has limited water-bearing formations, and has historically been a poor and unreliable source of groundwater. Three aquifers exist, a shallow alluvial aquifer in the upper basin above Interstate 5 (I-5), a deeper aquifer in the upper basin, and a shallow alluvial aquifer in the lower basin downstream of I-5. The two alluvial aquifers are separated by a shale formation in the vicinity of I-5. The upper aquifer has formed in alluvial deposits that average about 50 feet in depth under the Aliso Creek bed. The lower aquifer is very shallow and almost reaches the surface in many locations, likely because of the restricted canyon outlet to the ocean. In 1997, five wells were operated by the then Los Alisos Water District, now a part of Irvine Ranch Water District, all just south and west of the Foothills Transportation Corridor (upper Reach 2). Trabuco Canyon Water District is reported to operate three wells, producing high quality water, in the upper watershed.⁴⁹ Though limited groundwater pumping currently occurs in the Aliso Creek Watershed, withdrawals run the risk of allowing saltwater intrusion into the aquifer.

Groundwater Quality

In general, the shallow aquifers comply with groundwater standards for chloride, fluoride, sodium, manganese, and boron standards. However, there are exceedances of the sulfate, total dissolved solids, iron, and turbidity standards, and the overall mineral content is high.

There is the potential that groundwater quality may decrease in the next 50 years as an indirect result of development in the watershed. Continued urbanization increases the possibility for degradation of groundwater quality through the release of commercial and industrial contaminants. However, local, state, and federal regulations will remain as stringent or become more stringent in the future, hopefully preventing a significant deterioration of groundwater quality.⁵⁰

Dana Point Coastal Streams Watershed

The Dana Point Coastal Streams watershed is the smallest watershed in Orange County and almost fully developed. Priority concerns for the watershed include high levels of bacteria affecting Salt Creek Beach and nuisance flows and environmental issues at the Dana Point Harbor.

⁴⁸ Orange County Stormwater Program, 2004, *Watershed Annual Report, Aliso Creek Watershed*.

⁴⁹ Aliso Creek F5 Draft, 2001. p.3-16

⁵⁰ U.S. Army Corps of Engineers, 2001, *Aliso Creek Watershed Management Study*.

The main tributary of the Dana Point Coastal Streams Watershed is Salt Creek, which ultimately drains to the Pacific Ocean. A few smaller tributaries, including San Juan Canyon and Arroyo Salado, join Salt Creek as it makes its way through the watershed. The six-mile-square watershed is almost entirely developed, and therefore highly influenced by stormwater flows.

Surface Water Supply

Region 9 has designated four existing beneficial uses for Salt Creek, San Juan Canyon and Arroyo Salado: 1) agricultural supply; 2) non-contact water recreation; 3) warm freshwater habitat; and 4) wildlife habitat. Currently, no potable water supply is drawn from these surface waters.⁵¹ However, the City of Dana Point is developing a project that would allow urban runoff to be harvested and treated to be used for irrigation supply. This project follows the installation of the Salt Creek Ozone Treatment Plant and would reclaim the treated water for reuse through desalination treatment processes.

Surface Water Quality

Several beaches, as well as Dana Point Harbor, are 303(d) listed for indicator bacteria. A TMDL is being prepared and is expected to be issued in late 2005. The programs and activities conducted by the Watershed Permittees in pursuit of water quality improvement required the establishment of several coordination entities that include government agencies as well as members of the public. These entities oversee the activities of watershed-scale programs, and make decisions on the future direction of efforts. Water quality assessments are made by both the City of Dana Point and the Orange County Health Care Agency. Bacteria are a pollutant of concern with a high priority for Watershed Permittees due to the impact on beneficial uses at beaches. Trash is a potential constituent of concern.⁵²

The City of Dana Point is in the midst of construction of an innovative state-of-the-art urban runoff treatment system. The Salt Creek Ozone Treatment Plant treats the large flows of urban runoff discharging to Salt Creek Beach which has been plagued by beach posting due to high levels of bacteria. The project is anticipated to be completed in the fall of 2005. The City looks forward to see the water quality improvements at Salt Creek Beach, ultimately reducing the number of beach postings. Reduction and elimination of nuisance flows will be a continued long-term effort for the watershed.

A project to renovate the Dana Point Harbor is currently in the planning stages. The City of Dana Point has recently initiated correspondence with Army Corps of Engineers, who have been involved in previous construction in the Harbor, to discuss water quality impacts of the planned renovations. A Harbor circulation study has been requested. The Dana Point Harbor also requires mitigation measures to address environmental concerns. This project has

⁵¹ County of Orange, 2003, Drainage Area Management Plan.

⁵² County of Orange, 2003, *Drainage Area Management Plan, Dana Point Coastal Streams Watershed Chapter*.

involved significant coordination among the cities and other stakeholders via project meetings. The project is being designed to include several water quality BMP features.

Also related to Harbor activities is the July 24, 2003 request issued by Region 9 for technical studies in San Diego Bay, Mission Bay, Oceanside Harbor, Del Mar Boat Basin and Dana Point Harbor. This request focuses on a report that details a proposed coordinated comprehensive water quality monitoring program covering all five harbors in the Region 9 area. Region 9 recommends that this effort be coordinated through the Southern California Coastal Water Research Project based on their considerable experience in developing regional coastal monitoring programs.

Another priority in the watershed is the issue of Baby Beach which is chronically posted due to high bacteria levels. The County of Orange in cooperation with City of Dana Point Dana Point has developed and will implement a circulation pilot project beginning in June 2005 to evaluate the potential positive effects of circulation on reducing bacterial test contamination in waters along the shore in Baby Beach.

A Watershed Management Framework is being developed to assist in the supervision of the watershed, and in the 2003-2004 annual reporting year, the Watershed Chapter Committee, comprising of Co-Permittee representatives Dana Point, Laguna Beach, Laguna Niguel and County of Orange, met twice to discuss issues such as water quality impairments, effectiveness of distributing informational brochures, , the use of inlet grates and filters on catch basins, and the progress of the Salt Creek Ozone Treatment Plant in the City of Dana Point and water quality initiatives at Dana Point Harbor. The watershed committee continues to meet regularly to establish priorities and goals and develop programs to meet these goals.

Current water quality improvement activities include:

- City of Dana Point drain inlet filter program, covering all municipal storm drain inlets, and corresponding testing, which demonstrates effectiveness in removing heavy metals, organic and inorganic materials;
- Baby Beach Clean Beach Initiative, includes diversion of two storm drains flowing into Baby Beach in Dana Point Harbor for which the design of the diversion was completed in October 2004.
- Construction of nuisance water diversion with continuous deflective separation (CDS) storm drains was completed by the City of Laguna Beach.
- Construction of the City of Dana Point's Salt Creek Ozone Treatment Plant, expected to be completed in fall of 2005.
- The County of Orange installed an infiltrative swale at Dana Point Harbor.⁵³
- The initiation of the Baby Beach circulation pilot project.

⁵³ Orange County Stormwater Program, 2004, *Watershed Annual Report Dana Point Coastal Streams Watershed*.

San Juan Creek Watershed

Surface Water Supply

Regularly flowing waters along Trabuco Creek make surface water and groundwater available for supply to several local entities, including local golf courses as well as water agencies. Trabuco Canyon Water District has utilized shallow wells adjacent to Trabuco Creek for potable water supply. Due to the location of the wells and the geomorphic path of the creek, this supply could be referred to as surface water supply. However, for purposes of the IRWM Plan, and for consistency with documents from both MWDOC and Trabuco Canyon Water District, this supply will be categorized as groundwater. Currently, Trabuco Canyon Water District is pursuing a surface water treatment plant to provide a potable supply in the upper reaches of Trabuco Creek, as described further in Chapter 4. The City of Dana Point is investigating whether any of the summer water flow may be directed to return to the underlying aquifer for groundwater re-charge or perhaps recovery and reclamation rather than forming the temporary, stagnant summer pond beyond the sand berm at the mouth of San Juan Creek.

Surface water within the San Juan Creek watershed includes flowing waters within San Juan Creek and its tributaries, as well as waters in lakes and ponds (whether creek associated or creek independent). Historically, surface waters consisted primarily of the perennial creek flows in San Juan and Trabuco Creeks and the ephemeral flows in all of the smaller tributaries of the watershed. These flows derived from storm water runoff during the rainy season and from springs and groundwater seepage into the creek during the dry season.

Due to extensive development in the Oso and Trabuco Creek sub-watersheds, which has increased the impermeable surface area and decreased infiltration, ephemeral creek surface flows have become essentially perennial. The principal source of these added waters is runoff flows from urban activities such as lawn watering (e.g. homes, golf courses, greenbelts, schools) and other forms of irrigations. While San Juan Creek itself was perennial historically, numerous smaller tributaries undoubtedly were not. It is not possible to know exactly which tributaries did or did not have year-round water. Increased water in the tributaries of San Juan Creek provides more opportunity for vegetation establishment that may not have formerly existed. It also provides a source of erosion as low flows continuously act on the bed and banks of the channel system and associated infrastructure such as buried pipelines, bridge abutments, drop structures and channel linings. Perennial low flow carries contaminants that would normally remain in the upper reaches down into lower reaches of the channel system, and into the ocean itself. Low flow must be accounted for in formulating solutions, as it will remain a problem in the future in the absence of measures such as xeriscaping on all landscaping that would tend to reduce the quantity of water entering the channel as through-flow.⁵⁴

⁵⁴ U.S. Army Corps of Engineers, 2002, *San Juan Creek Watershed Management Study*.

Surface Water Quality

Poor water quality in the San Juan Creek watershed is not completely understood and may be related to numerous factors, but it is most objectionable in the form of bacteria and the exceedance of human health standards. The lower mile of San Juan Creek is 303(d) listed for indicator bacteria. A TMDL is being prepared and is expected to be issued in late 2005. Additional concerns include the presence of metals and other contaminants. High water temperatures (due to a loss of riparian habitat and destruction of “riffles” in the channel), low dissolved oxygen content, and high sediment load (turbidity) are also water quality problems. Causes of contamination may include human occupancy, pets, native wildlife populations, leaking pipes, fertilizer application, sewage spills, leaking dumpsters, and many other factors. Lack of riffles or rocky “falls” in the creek reduces oxygenation. Lack of tree shading raises water temperatures. The outcome of these factors has been the listing of San Juan Creek as an “impaired” water body for human contact, and closure of downstream beaches to swimming during extended periods of each year due to high bacteria counts. Specifically, the lower San Juan sub-basin, San Juan Creek mouth, and lower San Juan Creek are listed as impaired for elevated coliform bacteria levels. The effect of poor water quality on environmental resources includes exceedance of the parameters that would allow survival of native aquatic species, and of course, the wildlife dependent on them.⁵⁵

Two small tributaries to San Juan Creek, Oso Creek and Horno Creek have high counts of total dissolved solids, iron, and manganese, which contribute to the water quality of the San Juan Creek. Therefore, it has been determined that more intensive study is required to fully understand and assess the water quality, pollution sources and health impacts of water pollution in this watershed. A microbial source tracking and epidemiology study is a high priority project that is being pursued in this watershed.

San Juan Creek empties into Doheny Beach, which is frequently posted as exceeding State recreational water quality standards. Orange County Public Health Laboratory of the Orange County Health Care Agency (OCHACA) was subcontracted by the County of Orange to carry out a bacterial watershed study of San Juan Creek. Some of the conclusions of the study include: bacterial pollution measured by standard fecal indicator organisms was ubiquitous in storm drains and creeks in the San Juan Creek Watershed, storm drains are a major source of dry weather pollution, mean concentrations of indicators were not indicative of large or moderate levels of direct sewage contamination, indicator concentrations were markedly higher downstream compared to upstream, bacterial contamination was not limited to urban areas, and the methods of bacteria source tracking tested did not demonstrate sufficient accuracy and further studies are needed to validate source tracking methods using quality assurance testing. These conclusions will be further investigated in more detail and specificity in the proposed Doheny State Park Beach/San Juan Creek Investigation and Implementation Project.

In addition, a comprehensive watershed management study is being prepared by the U.S. Army Corps of Engineers for the San Juan Creek Watershed. This analysis has been underway for several years, and will serve to enhance understanding of the ecological and

⁵⁵ Army Corps of Engineers, 2002, *San Juan Creek Watershed Management Study*.

environmental processes within the Watershed, so that better water quality, flood control, and environmental mitigation decisions can be made. It is currently in the Feasibility Study phase.

Water quality activities from the 2003-2004 reporting year in the San Juan Creek watershed include:

- The City of Laguna Niguel conducted a street sweeping study that indicated more frequent street sweeping (weekly) did not substantially increase the volume of material picked up compared to twice monthly sweeping. However, the increased frequency did proportionately increase the percentage of dirt/particulates compared to organic materials.
- The City of Dana Point tested their extensive storm drain inlet filter program, discovering the filters are indeed effective in removing heavy metals, organic, and inorganic materials.
- The City of Dana Point has installed 6 storm drain low flow diversion units in this watershed.
- The City of Mission Viejo is installing catch basin inserts.
- The City of San Juan Capistrano has installed catch basin inserts with fossil filter and dry weather screens on 38 inlets.
- The City of Rancho Santa Margarita is planning to install an inline continuous deflection system unit on a storm drain inlet.
- Progression from the 1996 Corps study of the watershed into a spin-off 2002 Feasibility Phase which will focus on optimization and finalization of flood damage reduction/channel stabilization alternatives, ecosystem restoration alternatives, and recreation.⁵⁶

The Watershed Permittees, agency stakeholders and members of the public have held meetings for more than six years in an effort to better define problems, opportunities, and roles and responsibilities within the watershed. It is expected that participating jurisdictions and other stakeholders will continue to work together to address priority water quality issues.⁵⁷

Groundwater Supply

The San Juan Groundwater Basins, which underlie a large portion of the watershed, are the largest groundwater sources in South Orange County. The primary water-bearing unit within the San Juan Groundwater Basins is Quaternary alluvium. This alluvium ranges from a heterogeneous mixture of sand, silt, and gravel in the eastern portion of the basin, to coarse sand near the center, to fine-grained lagoonal sediments in the western portion of the basin. The most significant amount of groundwater used is that from the valley fill alluvium.⁵⁸

⁵⁶ Orange County Stormwater Program, 2004, *Watershed Annual Report San Juan Creek Watershed*.

⁵⁷ County of Orange, 2003, *Drainage Area Management Plan, San Juan Creek Watershed Chapter*.

⁵⁸ State of California Department of Water Resources, 1972, *Planned Utilization of Water Resources in the San Juan Creek Basin Area*.

The calculated total storage capacity of the San Juan Groundwater Basin has been estimated at 90,000 acre-feet by the Department of Water Resources in 1972, but some of this cannot be used due to potential seawater intrusion. In 1995, the San Juan Basin Authority approved the San Juan Basin Groundwater Management and Facility Plan. The Plan represents the first step in the implementation of the SJBA mission to develop and maintain a reliable, good quality and economical local water supply for the residents in the San Juan Groundwater Basin by maximizing use of local ground and surface water, the San Juan Creek and its tributaries, with due consideration for the preservation and enhancement of the environment, including, but not limited to, natural resources, fish and wildlife, infrastructure improvements and the cultural heritage of the area.⁵⁹ Water Rights of groundwater in the San Juan Basin are granted to regional entities, including the SJBA, City of San Juan Capistrano Water Services Department, and South Coast Water District. Trabuco Canyon Water District has pending groundwater rights in the basin. The recent construction of the San Juan Capistrano Groundwater Recovery Project represents a major step towards the development of the San Juan Basin as a local water resource. As noted above, the possibility of encouraging San Juan Creek dry season ground water recharge is under investigation.

Rainfall remains an important recharge input component. Recharge consists of streambed percolation in the mainstem streams: San Juan and Trabuco Creeks, rainfall infiltration and deep percolation to the water table, deep percolation of applied water from landscape and agricultural irrigation, and subsurface inflow from tributary alluvial riverbed areas. Discharge from the basin consists of well extractions, uptake by plants, and subsurface outflow to the Pacific Ocean.⁶⁰

Sustained yield is likely to increase gradually in the future due to development of the tributary watershed areas that will see increased urbanization and landscape irrigation with imported water. This urbanization results in an increase in impervious surfaces of the watershed, which will increase subsurface inflow from tributary areas and increase stream baseflow which will result in increased streambed percolation in the main basin. Irrigation runoff with imported water into tributary areas at buildout is also a concern.⁶¹ However, any outdoor water use efficiency practices implemented during development should reduce the amount of runoff produced by irrigation.

Groundwater Quality

Water in the lower basins is high in sulfate, iron, chloride, manganese and total dissolved solids making it unusable for domestic use without treatment. The City of San Juan Capistrano has recently completed construction of a 5,600 acre-feet per year groundwater recovery plant. The plant is supplied by 5 wells located in the lower San Juan Groundwater Basin. The brackish water from these wells is conveyed to the plant where it is purified by reverse osmosis. The treated water is suitable for domestic use.

⁵⁹ San Juan Capistrano, 2003, Urban Water Management Plan.

⁶⁰ San Juan Basin Authority and Metropolitan Water District, 1994, *San Juan Basin Groundwater Management and Facility Plan*.

⁶¹ San Juan Basin Authority and Metropolitan Water District, 1994, *San Juan Basin Groundwater Management and Facility Plan*.

Extractions from the San Juan Groundwater Basin had until recently declined due to the poor local water quality. Cleanup of this resource is required for any domestic or environmental use due to problems with sulfate, chloride, manganese, and total dissolved solids, which are considered to be too high for domestic use and problems with total dissolved solids, chloride, and boron, which are considered to be too high for irrigation use. It is further believed that much of the salt content in the groundwater comes from the marine sediments that underlie much of the basin. Seawater intrusion could also be a potential problem in the coastal portions of the basin, necessitating recharge efforts.⁶²

Historically, the Upper San Juan Groundwater Basin is shallower, but of higher quality than the Lower Basin. Trabuco Canyon Water District and the City of San Juan Capistrano both operate pumps for potable water from the Upper Basin. Furthermore the Santa Margarita Water District operates a small well at the Nichols Institute. However, because of the shallow nature of the Upper Basin, there is less available storage making operation of the wells an unreliable perennial source.

A groundwater desalter became operational on December 2, 2004 in San Juan Capistrano to treat the brackish groundwater in the deeper, more abundant Lower Basin. Water appropriated from this project will improve rather than harm the water quality of the basin because the water extracted will create storage space in the basin for the percolation of the better quality surface water. Also, return flow will be of higher quality than the water originally extracted. Some improvement of the Lower San Juan Groundwater Basin water quality is therefore expected.⁶³ Groundwater testing has indicated that there are high levels of total dissolved solids, iron, and manganese.

San Clemente Coastal Streams Watershed

Surface Water Supply

Two main streams flow through the San Clemente Coastal Streams Watershed: Prima Deshecha Canada and Segunda Deshecha Canada. Both have several smaller tributaries and drain to the Pacific Ocean. Region 9 has designated five existing beneficial uses for both streams: agricultural supply, contact water recreation, non-contact water recreation, warm freshwater habitat and wildlife habitat. Currently, surface waters from this watershed are not used as a potable water source.

Surface Water Quality

Both the Orange County Health Care Agency and the City of San Clemente currently conduct water quality sampling. Constituents of concern in the San Clemente Coastal Streams Watershed are under assessment. Bacteria continue to be a major identified water

⁶² U.S. Army Corps of Engineers, 2002, *San Juan Creek Watershed Management Study*.

⁶³ San Juan Capistrano, 2003, *Urban Water Management Plan*.

quality problem, and ongoing studies are underway. Cadmium, nickel and trash are on a watch list.⁶⁴

To maintain high quality water in the San Clemente Watershed, the City of San Clemente began sampling 15 locations throughout the San Clemente Coastal Watersheds in July 2003, as part of a dry weather water quality monitoring program. The developers of Talega (a large residential and commercial development area within the City) are sampling two additional sites at the downstream boundary of their project. The program is being conducted in accordance with the City's guidance included in the permit issued by the Regional Board. Once collected, the data will help the City in characterizing dry weather flows and detecting illegal discharges into the City's storm drainage system.

In coordination with the City of San Clemente, the County of Orange has contracted with Weston Solutions/MEC Analytical Systems for a source tracking investigation that will identify spatial patterns of indicator bacteria sources at five locations in the Prima Deshecha channel. Bacteria load, which is the product of flow and concentration, will be assessed during three 24-hour surveys during the dry summer months. In addition to the spatial patterns of the bacteria, microbial source tracking (MST) techniques will be used to identify the host origin of the bacteria within the watershed. The same approach will be utilized as was recently used to assess the sources of indicator bacteria in Mission Bay (San Diego County). Results of the study will indicate which animal species, including human, contribute most to the bacterial problem that much of the region's surface and ocean waters experience. This will enable agencies to direct resources to the appropriate and achievable areas of bacterial reduction, rather than directing funds at programs that yield little real reduction. The study by MEC has begun and will be complete by late 2005.

Poche Beach is located at the mouth of the Prima Deshecha Canada Channel and lies on the border between the cities of Dana Point and San Clemente. The beach has been routinely posted for exceedances of the AB 411 fecal indicator bacteria standard when tested in the surf zone. In 2001, Poche Beach was provided Proposition 13 funds through the Clean Beaches Initiative to improve water quality by the construction of a UV bacteria disinfection system at the mouth of the channel under Coast Highway. San Diego RWQCB, Region 9, issued a 13225 Directive on July 3, 2002, mandating that a source tracking study, BMP study findings and an implementation schedule of the UV installation be provided to Region 9. The UV treatment BMP was installed and operated during summer 2003 and summer 2004.

Another source tracking investigation in Orange County is being conducted by Southern California Coastal Water Research Project (SCCWRP) in collaboration with the University of California Irvine, County of Orange Health Care Agency, RWQCB (Region 9) and the County of Orange. This group has proposed a source identification investigation to protect the environmental resources of the region, and is in the planning stages.

⁶⁴ County of Orange, 2003, *Drainage Area Management Plan, San Clemente Coastal Streams Watershed Chapter*.

During the 2003-2004 reporting period, the Watershed Chapter Committee, comprised of Permittee representatives, met to discuss issues that included UV radiation treatment at Poche Beach and the effects of a local land fill and golf course on existing water quality.

Current programs and activities to improve water quality in the San Clemente Coastal Streams Watershed include:

- City of San Clemente Dry Weather Monitoring Program to detect illicit connections and illegal discharges and to characterize urban runoff.
- Establishment of three storm drain dry weather diversions by the City of San Clemente.
- Poche Beach Clean Beach Initiative, for which the County of Orange and the City of San Clemente have partnered to install and operate an ultraviolet disinfection system where the flood control channel empties onto Poche Beach and testing from July 2004 indicates the device removes approximately 70% of bacteria entering the system.⁶⁵
- North Beach Urban Runoff Treatment Facility is under design by the City of San Clemente for the Segunda Deschecha watershed. The project may utilize ultra violet disinfection with discharge to the ocean.

San Mateo Creek Watershed

The majority of the San Mateo Creek Watershed is undeveloped, with no plans for future use at this time except for a small portion that is being developed within the City of San Clemente. Due to the current undeveloped nature of the San Mateo Creek Watershed within Orange County, County-led efforts focusing on the establishment of a long-term Watershed Management Framework have been limited. However, the protection of the environmental resources in the watershed has supported the need to create a watershed management plan. The future watershed management framework could take many forms, among them coordination with on-going activities of the Donna O'Neill Land Conservancy, or participation in the broader San Mateo Creek Watershed initiatives with State Parks, the U.S. Marine Corps, and San Diego County. Regardless of the form, watershed plans for the San Mateo Creek Watershed will be designed to protect and enhance the water quality and environmental resources.

Surface Water Supply

The San Mateo Creek Watershed is located in both Orange County and San Diego County. The watershed drains into the Pacific Ocean at San Onofre State Beach. Tributaries to San Mateo Creek, the largest creek in the watershed, are Gabino Canyon, Paz Canyon and Blind Canyon, which combine and flow into Cristianitos Creek. Existing beneficial uses designated by Region 9 are cold water habitat, rare species habitat, contact water recreation, non-contact water recreation, spawning habitat, warm water habitat, and wildlife habitat. Surface waters are not currently used as a potable water source.

⁶⁵ Orange County Stormwater Program, 2004, Watershed Annual Report, *San Clemente Coastal Streams Watershed*.

Surface Water Quality

Water quality improvement programs within the San Mateo Creek Watershed are conducted by both the Watershed Permittees individually implementing jurisdictional programs in their Local Implementation Plans in conjunction with the municipal NPDES stormwater permit, and in a collective process with other stakeholders to address specific water quality issues on a watershed scale. As the majority of this watershed is undeveloped, minimal watershed management has been implemented and very little water quality data has been collected. In the future, it is anticipated that water quality issues that are determined to be specific to a jurisdiction would be referred to that jurisdiction and thereafter be addressed as a jurisdictional program initiative through the applicable LIP. Alternatively, the issue may originate from multiple jurisdictions within the watershed. In this instance, the problem would be addressed as a watershed cooperative effort.⁶⁶

In the 2003-2004 reporting period, the Watershed Chapter Committee comprised of Permittee representatives met and agreed to continue meeting on an annual basis pending the development occurring in the watershed.

Groundwater Supply

The San Mateo Groundwater Basin is a small basin that underlies San Mateo Valley and Christianitos Canyon in southeastern Orange County and northwestern San Diego County. Recharge is derived from percolation of runoff from rainfall and effluent from a wastewater treatment plant. The infiltration is through natural reaches and five spreading basins in the stream channel of the San Mateo Creek. Water levels vary with wet and dry weather cycles, and low levels generally recover during wet periods. Pumping from this aquifer is thought to be met in part from increased deep percolation of runoff in San Mateo Creek and its tributaries, decreasing the length of channel available to sustain riparian vegetation.

The total capacity for this basin is estimated to be 14,000 acre feet. Pumping from this aquifer is thought to be met in part from increased deep percolation of runoff in San Mateo Creek and its tributaries, decreasing the length of channel available to sustain riparian vegetation. San Clemente utilizes water from the northern portion of the basin, pumping up to 1,100 acre feet per year for potable sources.⁶⁷ Camp Pendleton Marine Corps Base also pumps from the basin in San Diego County. San Mateo Basin groundwater is currently the only water resource for domestic, municipal, industrial, and agricultural water demand in the northern part of Camp Pendleton. The amount of water pumped at the base is not known at this time.

⁶⁶ County of Orange, 2003, *Drainage Area Management Plan, San Mateo Creek Watershed Chapter*.

⁶⁷ Department of Water Resources, 2003, *San Mateo Valley Groundwater Basin, California's Groundwater Bulletin 118*.

Groundwater Quality

Groundwater in the San Mateo Groundwater Basin is calcium-sodium bicarbonate-chloride in character, and was rated suitable for domestic and irrigation uses by the Department of Water Resources in 1967.⁶⁸

The City of San Clemente has extracted water from their local sub-basin since the 1950's, and has historically found excessive iron and manganese, which is removed at a water treatment plant before entering the City's supply. The City of San Clemente's sub-basin is located in the northern flank of the main San Mateo groundwater basin and, therefore, the groundwater quality of its sub-basin is not entirely indicative of the water quality for the larger San Mateo groundwater basin.⁶⁹

⁶⁸ Department of Water Resources, 2003, *San Mateo Valley Groundwater Basin, California's Groundwater Bulletin 118*.

⁶⁹ NBS/Lowry. *San Mateo and San Onofre Groundwater Basins, Camp Pendleton, Conjunctive Use Management Model*. November 1994.

APPENDIX C

SOUTH ORANGE COUNTY IRWM GROUP CITY DESCRIPTIONS

City of Aliso Viejo

Aliso Viejo is a seven square mile planned community of approximately 44,000 people in South Orange County. It is situated approximately four miles from the Pacific Ocean. Aliso Viejo has dedicated 51% of its land to wilderness and community parks, recreation, schools and community facilities. Residential neighborhoods comprise 36% of the land, while 13% of the community is dedicated to business, office and retail. Approximately 85% of the city lies in the Aliso Creek Watershed. The remaining portion in the northwest part of the city drains to the Laguna Coastal Streams Watershed.

City of Dana Point

The City of Dana Point lies directly on the Pacific Coast. The city covers an area of approximately 6.5 square miles with a population of just over 38,000 people. The City of Dana Point is characterized by nearly seven miles of prominent coastal bluffs and rolling hills along the Pacific coastline. Most noteworthy of these bluffs is a unique promontory known as the “Headlands” which overlooks Dana Point Harbor, one of the most significant man-made alterations of the Orange County coastline. The City of Dana Point falls within three watersheds. These include Dana Point Coastal Streams Watershed, San Juan Creek Watershed, and San Clemente Coastal Streams Watershed. These drain largely into their respective receiving creeks, but some portions drain directly to the Pacific Ocean.

City of Laguna Beach

The City is a hillside community that lies on the southwestern coast of Orange County, about 50 miles from the greater Los Angeles area. The City is a major worldwide year-round tourist destination with a unique Pacific Ocean coastal environment. The physical setting of the City is characterized by about 7 miles of Pacific Coastline with a coastal plane located at the base of the San Joaquin Hills that trend the length of the City. Within the City there are significant areas of hillsides and canyons that are undeveloped. The majority of these areas are regional open space lands. The City covers an area of approximately 9 square miles with a population of about 24,000 people.

The City is a part of three major San Juan Hydrologic Unit watersheds, which are the Laguna Coastal Streams Watershed, Aliso Creek Watershed, and Dana Point Coastal Streams Watershed. Natural and urbanized drainage from these watersheds flow to the Pacific Ocean. The city coastline represents important marine resources. The Heisler Park Ecological Reserve is a state-designated area of special biological significance, and the entire coastline has been designated a State Marine Park under the 1999 State Marine Life Protection Act.

City of Laguna Hills

Covering an area of approximately 6.6 square miles, the City of Laguna Hills has a population of just over 33,900 people. It is located in central southern Orange County, and does not border the coastline. The City of Laguna Hills falls within three major watersheds. These are San Juan Creek Watershed, Aliso Creek Watershed, and the San Diego Creek Watershed.

City of Laguna Niguel

Laguna Niguel is a 14.72 square mile planned community in South Orange County, California and is located halfway between Los Angeles and San Diego. Existing and planned use of Laguna Niguel includes 3,549 acres residential, 276 acres commercial, 223 acres mixed uses, 222 acres public/institutional facilities and 3,650 acres designated to parks and open space. The City has approximately 67,000 residents. Land formations in the City of Laguna Niguel drain into three major watersheds: Aliso Creek Watershed, Dana Point Coastal Streams Watershed, and San Juan Creek Watershed.

City of Laguna Woods

Sitting on roughly 4 square miles, the City of Laguna Woods is home to about 18,500 residents and is a primarily residential community. Leisure World, a gated senior community, represents the majority of the residential areas within the city. It is in the central portion of southern Orange County, about ten miles from the ocean in Saddleback Valley. The City drains into three major watersheds. They are Aliso Creek Watershed, San Diego Creek Watershed, and Laguna Coastal Streams Watershed.

City of Lake Forest

The City of Lake Forest is master-planned City located between Interstate 5 and Saddleback Mountain in the central portion of South Orange County. The City has a population of over 76,000 people within 17 square miles planned for 3,000 acres of residential, 3,300 acres of open space/parks, 2,600 acres of commercial, industrial, and business parks, and 2,000 acres of public facilities. Lake Forest represents most of the upper reaches of two major watersheds: about 30% in the San Diego Creek Watershed and 70% in the Aliso Creek Watershed.

City of Mission Viejo

The City of Mission Viejo is one of the original master planned communities in South Orange County, with the first homes being built and sold in 1966. The City is approximately 17 square miles in size with a population of approximately 98,000. The City values its open spaces with approximately 30% of the land area dedicated to open space and parks. The remaining uses are approximately 60% residential and 10% commercial/light industrial. About 80% of the City is within the San Juan Creek Watershed, while the remaining 20% lies within the Aliso Creek Watershed. The westerly City limit is generally taken to be Interstate 5 extending from north of the Alicia Parkway exit adjacent to the City of Lake Forest to south of the Avery Parkway exit adjacent to the City of San Juan Capistrano.

City of Rancho Santa Margarita

The City of Rancho Santa Margarita is a small urban community located in the eastern portion of South Orange County along the Santa Ana Mountains. It is situated on approximately 15 square miles, and is home to over 48,500 residents. The city drains primarily into San Juan Creek Watershed, and partially into Aliso Creek Watershed.

City of San Clemente

Lying on the southern coast of Orange County is the City of San Clemente. It covers an area of about 18 square miles and maintains a population of 63,000 people. San Clemente is primarily characterized by steep coastal mountains that are divided by a series of local canyons. The city drains primarily into the San Clemente Coastal Streams Watershed, with which it shares almost an identical boundary. Small portions of the city also drain to the San Mateo Creek Watershed and San Juan Creek Watershed.

City of San Juan Capistrano

One of the oldest cities in the region, San Juan Capistrano is now home to about 35,000 people. The city is located on just over 14 square miles and is in South Orange County, just 1.5 miles from the Pacific Ocean. The city consists of primarily residential neighborhoods and prides itself on its protected open space, which accounts for 38% of its total area. San Juan Capistrano falls within the San Juan Creek Watershed and the San Clemente Coastal Streams Watershed.

APPENDIX D

SOUTH ORANGE COUNTY IRWM GROUP AGENCY SERVICE AREA ROLES AND RESPONSIBILITIES

The following is a brief description of water/wastewater agency service areas within the region, as well as collaborative State agencies, and responsibilities toward plan implementation:

California Department of Parks and Recreation

The California Department of Parks and Recreation seeks to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. They have jurisdiction over several natural areas in South Orange County, including Crystal Cove State Park, Doheny State Park Beach, San Clemente State Beach and Corona Del Mar State Beach.

City of San Clemente Utilities Division

The City of San Clemente Spans 18 square miles of coastline and scenic foothills and provides water and sewer services to a population of 47,800 which is anticipated to increase to a maximum of 49,000 by the year 2020.

City of San Juan Capistrano Water Services Department

The City of San Juan Capistrano's Public Works Department took over operation of the Capistrano Valley Water District in 1997. The City of San Juan Capistrano services an area of approximately 14.4 square miles. The existing service area population is 35,500 and is projected to increase to 41,725 by ultimate build out in the year 2020. The City's system consists of 33 separate pressure zones, which include 190 miles of pipelines, ten reservoirs, nine booster pump stations, 2 imported sources of domestic water supply, two potable water wells, and a 5 million gallon per day (MGD) groundwater recovery plant. The City currently supplies an average daily demand of 7.44 MGD, with a maximum daily demand of 14.14 MGD.

County of Orange

The County of Orange, represented in this process primarily by the Watershed and Coastal Resources Division, is active in integrated water management in various ways. The County is both a landowner and a regional planner for the area, and is entrenched in various municipal operations such as roads and flood control. Furthermore, the County is partnered with each city and the Orange County Flood Control District for the NPDES permits distributed by the Regional Water Quality Control Boards. Through the Watershed and Coastal Resources Division, the County has also been a primary coordinator for regional water quality testing, inspection, education and documentation. The County has jurisdiction over several County beaches, parks, and facilities including Dana Point Harbor.

El Toro Water District

ETWD provides water service to approximately 51,000 residents situated on 5,430 acres. Their six reservoirs have a combined capacity of 136 million gallons. Additionally, they provide sanitation services through their wastewater treatment plant and perform all of their own industrial pretreatment. Serviced communities include Laguna Woods, Laguna Hills, Mission Viejo, Lake Forest and Aliso Viejo.

Irvine Ranch Water District

Irvine Ranch Water District encompasses nearly 85,019 acres, or 133 square miles, in southern central Orange County. IRWD serves all of the city of Irvine and portions of Tustin, Newport Beach, Costa Mesa, Orange and Lake Forest. Irvine Ranch Water District extends from the Pacific Coast to the foothills, with elevations ranging from sea level to 1,700 feet.

Laguna Beach County Water District

LBCWD supplies approximately 25,000 residents over 5,542 acres through Laguna Canyon and areas adjacent to the Pacific Ocean.

Moulton Niguel Water District

MNWD provides imported water, recycled water and wastewater collection and treatment for approximately 165,000 residents in an area over 40 square miles and includes the City of Laguna Niguel and portions of the cities of Laguna Hills, Mission Viejo, Dana Point, and Aliso Viejo.

Municipal Water District of Orange County

The Municipal Water District of Orange County (MWDOC) is a public, planning and resource management agency that was formed in 1951 and today provides imported water to more than two million Orange County residents through 27 cities and water districts and two private water companies. MWDOC's overall service area is a total of a 600 square-miles. MWDOC's water management goals and objectives include working together with Orange County water agencies to focus on solutions and priorities for improving Orange County's future water supply reliability.⁷⁰ In order to maintain a more reliable water supply, MWDOC continues to implement a number of projects including storage, recycling, conjunctive use with groundwater basins, ocean desalination and new groundwater development will contribute to enhanced water reliability.

Natural Resources Conservation Service

The Natural Resources Conservation Service (NRCS) provides expertise and technical assistance to government agencies and owners of private land for conserving their soil, water,

⁷⁰ MWDOC. Regional Urban Water Management Plan, p. 1-6. 2000.

and other natural resources. Emphasis is placed on local partners and cooperative progress. Many opportunities for partnership with the NRCS exist in South Orange County.

Orange County Flood Control District

The Orange County Flood Control District's mission includes provisions for control of flood and storm waters of the district and of streams flowing into the district, conservation of such waters for beneficial purposes, and protection of the harbors, waterways, public highways and property in the district. They are also intricately involved in water quality monitoring, and are partnered with the County of Orange and individual cities in the NPDES process.

Orange County Health Care Agency

The Orange County Health Care Agency is dedicated to protecting and promoting the optimal health of individuals and families through partnerships, leadership, policy development and service. The agency is highly involved with water quality in the region, and is responsible for obtaining a minimum of weekly samples of water quality at over 150 locations along the Orange County coastline, an activity that has been ongoing for 40 years.

San Juan Basin Authority

The San Juan Basin Authority (SJBA) was created in 1971 as a Joint Powers Agency for the purpose of carrying out water resources development of the San Juan Basin (Basin). The current members of the Authority are the Santa Margarita Water District (SMWD), Moulton Niguel Water District (MNWD), City of San Juan Capistrano Water Services Department, and the South Coast Water District (SCWD). These districts are the major retail water agencies within the basin.

Santa Margarita Water District

SMWD services 62,000 acres with a population of 132,500 with potable water and recycled water and operates 3 sewage treatment plants. Communities serviced include Rancho Santa Margarita, Los Flores, Coto de Caza, Mission Viejo and Ladera Ranch. SMWD operates 30 domestic water reservoirs containing 298,000,000 gallons.

South Coast Water District

SCWD delivers an estimated seven million gallons of potable water per year to 45,000 residents within their service area, and remove four million gallons of wastewater for treatment per day. SCWD also provides recycled water to its service area. Current water storage capacity is 40.9 million gallons.

South Orange County Wastewater Authority

SOCWA was created as a regional joint powers authority with ten member agencies in 2001. Its mission is to plan for, acquire, construct, maintain, repair, manage, operate and control facilities for the collection, transmission, treatment, and disposal of wastewater; the reclamation of wastewater for beneficial reuse as recycled water on behalf of its member agencies; and the treatment, disposal and beneficial reuse of wastewater biosolids. The authority serves approximately 520,000 residents in a 220 square mile service area which is

roughly co-terminus with the area of the IRWMP. The Authority operates 4 regional wastewater treatment plants and 2 ocean outfalls.

Trabuco Canyon Water District

Trabuco Canyon Water District (TCWD) serves the Communities of Trabuco Canyon, Robinson Ranch, Trabuco Highlands, Walden, Rancho Cielo, Portola Hills, Santiago Canyon Estates and Dove Canyon.

APPENDIX E

SOUTH ORANGE COUNTY IRWM PLAN LETTERS OF SUPPORT FROM NON-AGENCY ORGANIZATIONS, COMMUNITY GROUPS, AND OTHERS

The following organizations, community groups and others have provided Letters of Support in coordination, development and implementation of the South Orange County Integrated Regional Water Management Plan. Copies of the letters are included on the following pages.

- » Orange County Business Council
- » MIOCEAN
- » Juaneno Band of Mission Indians
- » National Hispanic Environmental Council



2 Park Plaza, Suite 100 • Irvine, California 92614-5904
phone: 949.476.2242 • fax: 949.476.0443 • url:www.ocbc.org

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VICE PRESIDENT,
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WORKFORCE DEVELOPMENT
Paul Garra, Jr.

VICE PRESIDENT,
FINANCE & ADMINISTRATION
Danaite Parente

January 13, 2005

Mr. Larry McKenney → *Mark Thomas*
County of Orange
Watershed & Coastal Resources Division
300 N. Flower Street, 7th Floor
Santa Ana, CA 92703-5000

Dear Larry:

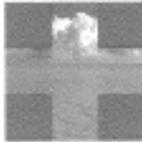
It is gratifying to see Orange County's water agencies pulling together to ensure adequate water supplies, good quality water, and clean beaches for all of the county. Thank you for your presentation on Tuesday concerning the collaborative Prop. 50 grant-writing effort. Please keep us informed as this process moves along and let us know how we can support this effort.

Sincerely,

Terry Hartman
Terry Hartman
Chair, Infrastructure Committee
Irvine Community Development
Company

Julie Puentes
Julie Puentes
Executive VP Public Affairs

SHAPING ORANGE COUNTY'S ECONOMIC FUTURE



miocean

P.O. Box 14340
Irvine, CA 92623
949.464.0101
888.4MIOCEAN

March 4, 2005

Mr. Larry McKenney
Director, Watershed & Coastal Resources
Resources and Development Management Department
County of Orange
300 N. Flower
Santa Ana, CA 92703-5000

**RE: Integrated Regional Water Management Group (IRWMG)
Prop. 50 Grant Applications**

Dear Larry:

We are pleased to forward this letter to you and the IRWMG expressing our keen interest in the planning and watershed protection projects stemming from funding being sought in Sacramento under Proposition 50. As you know, Miocean is a 501(c)3 non-profit foundation focused entirely on raising private sector funds (generally corporate in nature) to fortify local government efforts to remove ocean pollution on south coast beaches. Our success with North Creek, Salt Creek, and now the Newport Upper Back Bay have given us funding momentum to seek out new projects for the future. That is the genesis behind our interest in your group and its' effort to obtain State funds.

Miocean also focuses nearly 50% of the funds we raise on education and prevention. Should any projects of this nature arise, we would also be interested in supporting those efforts. We currently fund a State certified curriculum at the Ocean Institute in Dana Point that teaches 1500 5th graders every year teaching about urban run-off and pollution, through a hands-on science program. We also will be funding a similar program in the future Back Bay Science Center, which the City of Newport Beach and the County of Orange are working together on.

We know that there are dozens of worthy projects scattered throughout the south coast area, and we welcome the organization that the IRWMG brings to prioritize and effectuate implementation for these projects. Please let us know if there is anything else we can do to further your effort in Sacramento. Thanks, as always, for your interest in Miocean.

Best regards,

MIOCEAN

Patrick R. Fuscoe, P.E.
Chairman

bringing our oceans back to life
www.miocean.org

June 23, 2005

Mr. Larry McKenney
Director, Watershed and Coastal Resources
County of Orange
300 N. Flower
Santa Ana, Ca 92703-5000

Dear Mr. McKenney,

We support the projects proposed by the South Orange County IRWM Group which is seeking funds provided by Prop. 50. It is essential that we protect and improve our water quality and oceans from pollution so future generations can benefit from all that it provides. We applaud your efforts!

Please keep us informed as this process moves along and let us know if we can provide any further assistance.

OHO'VAN
Respect



David Belardes
Chief and Chairman

**National Hispanic
Environmental Council**

July 5, 2005



Mr. Larry McKenney
Director, Watershed & Coastal Resources
Resources and Development Management Department
COUNTY OF ORANGE
300 N. Flower
Santa Ana, CA 92703-5000

Subject: South Orange County Integrated Regional Water Management Plan

Dear Mr. McKenney:

The National Hispanic Environmental Council (NHEC) supports the development and implementation of the Integrated Regional Water Management Plan (IRWM Plan) for the South Orange County region.

NHEC is a national, non-profit, membership-based organization founded in 1995. Our organization seeks to educate, unite, and engage the Latino community on environmental and sustainable developmental issues. Currently there are over 4,500 members across the country all of whom further our guiding credo: "because it's our environment too."

In my opinion, the IRWM Plan involves numerous water projects that will significantly benefit the disenfranchised communities in the region, particularly the Latino community. It is essential to support efforts that involve our community with water management issues. We greatly appreciate and support the IRWM Plan and the benefits it will bring to Latino families in South Orange County.

Implementation of the IRWM Plan will provide a significant measure in achieving environmental justice by offering safe, clean, and healthy environments for all to live, work, and recreate on a fair and equal basis.

If there are any questions or concerns, please contact me at 323-908-0782.

Sincerely,

A handwritten signature in black ink that reads "Oscar Gonzales Jr." with a stylized flourish at the end.

Oscar Gonzales
Southern California Coordinator
National Hispanic Environmental Council

Oscar Gonzales
Los Angeles/S. CA Outreach Coordinator
1278 La Veque Avenue
East Los Angeles, CA 90063
Work (323) 908-9672 Cell (323) 945-6484
ogonzales@nheec.org

Roger Rivera
President, NHEC
106 N. Fayette Street
Alexandria, VA 22314
(703) 683-3956 FAX: (703) 683-5125
www.nheec.org

Printed on recycled paper

APPENDIX F

RESOLUTIONS AND/OR LETTERS OF ACCEPTANCE/ADOPTION/SUPPORT/APPROVAL FOR THE SOUTH ORANGE COUNTY IRWM PLAN

The following Resolutions and Letters of Acceptance/Approval for the South Orange County IRWM Plan are included on the following pages:

Resolutions of Acceptance

- City of Dana Point
- City of Laguna Beach
- City of Laguna Niguel
- City of Laguna Woods
- City of Mission Viejo
- City of San Clemente
- County of Orange
- Moulton Niguel Water District

Resolutions of Adoption

- City of Aliso Viejo
- City of San Juan Capistrano
- El Toro Water District
- Municipal Water District of Orange County
- San Juan Basin Authority
- Santa Margarita Water District
- South Coast Water District
- South Orange County Wastewater Authority
- Trabuco Canyon Water District

Resolutions of Support

- City of Laguna Hills
- City of Rancho Santa Margarita

Letters of Support

- City of Lake Forest

Resolutions of Acceptance

City of Dana Point Resolution

RESOLUTION NO. 05-06-08-03

**A RESOLUTION OF THE CITY OF THE CITY COUNCIL OF THE CITY OF
DANA POINT, CALIFORNIA, ACCEPTING THE "SOUTH ORANGE COUNTY
INTEGRATED REGIONAL WATER MANAGEMENT PLAN"**

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF DANA POINT, CALIFORNIA, DOES RESOLVE, DECLARE, DETERMINE AND ORDER AS FOLLOWS:

WHEREAS, the City Council of the City of Dana Point, hereinafter referred to as the "CITY", has the mission of providing healthful water quality and over the past several years has completed considerable work with respect to improving water quality in Dana Point; and

WHEREAS, CITY has authorized its staff to participate in development of the South Orange County Integrated Regional Water Management Plan ("SOC IRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, CITY recognizes that improved coordination among local agencies in the region with responsibilities for managing water resources and water quality is regionally responsible; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to come together to integrate programs and projects that protect and enhance regional water resources and water quality; and

WHEREAS, a regional water management group was formed in South Orange County, which included participation by CITY, and was facilitated by the County of Orange; and

WHEREAS, said proceedings provide for the adoption of said Plan consisting of qualified programs and projects over which the participants in the regional water management group have authority to undertake; and

RESOLUTION NO. 05-06-08-03
Page 2

WHEREAS, the CITY has now reviewed said Plan with its staff and made it available to the general public at its City Council meeting on June 8, 2005.

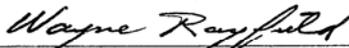
NOW, THEREFORE, the City Council of the City of Dana Point, California, does hereby Resolve, Determine and Order as follows:

Section 1. The above recitals are all true and correct.

Section 2. The South Orange County Integrated Regional Water Management Plan is hereby accepted for the purposes of moving forward with the proposed projects and programs included therein in continued coordination with the SOC IWRMP Management and Governance Group, under the coordination with the County of Orange as the Administrator of the Plan.

Section 3. It is hereby ordered that said Plan be filed with the State of California Department of Water Resources, State Water Resources Control Board, State Department of Health Services, or CALFED, as appropriate.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Dana Point at its regular meeting held on the 8th day of June 2005.



WAYNE RAYFIELD, MAYOR

ATTEST:



SHARIE APODACA, INTERIM CITY CLERK

City of Laguna Beach Resolution

RESOLUTION NO. ~~05.054~~

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGUNA BEACH ACCEPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN (IRWMP)" AND AUTHORIZING THE SUBMISSION OF AN APPLICATION TO THE CALIFORNIA DEPARTMENT OF WATER RESOURCES AND STATE WATER RESOURCES CONTROL BOARD TO OBTAIN PROPOSITION 50 IMPLEMENTATION GRANT FUNDING FOR PRIORITY IRWMP IMPROVEMENT PROJECTS.

WHEREAS, the Proposition 50, the Water security, Clean Drinking Water, Coastal and Beaches Protection Act of 2002, was passed by California voters in November 2002. It amended the California Water Code to add, among other articles, Section 79560 *et seq.*, authorizing the legislature to appropriate approximately \$380 million for Integrated Regional Water Management projects; and

WHEREAS, the California Legislature declared in SB 1672 that the implementation of Proposition 50 will facilitate the development of Integrated Regional Water Management Plans, thereby improving water quality, maximizing water supply and help protect the environment by providing a framework for local agencies to integrate local programs and projects; and

WHEREAS, a South Orange County regional water management group was formed, facilitated by the County of Orange, to develop a IRWMP to achieve the Proposition 50 grant program goals; and

WHEREAS, The County of Orange, as the IRWMP administrator, has determined that the IRWMP is statutorily exempt from the provisions of CEQA pursuant to Section 15262 of the CEQA guidelines; and

WHEREAS, the regional water management group provides for the approval of said IRWMP consisting of qualified programs and improvement projects, which the participants in the regional water management group have authority to undertake.

NOW, THEREFORE, the City Council of the City of Laguna Beach does resolve as follows:

SECTION 1. The City of Laguna Beach hereby accepts the IRWMP for the purposes of moving forward with the proposed projects and programs included therein in continued

coordination with the South Orange County regional water management group, under the coordination with the County of Orange as the administrator of the IRWMP.

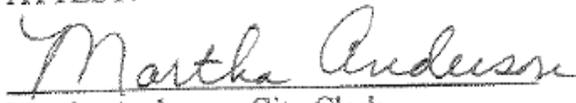
SECTION 2. Authorized staff to work with the South Orange County regional water management group to submit a Proposition 50 grant application to fund priority improvement projects described in the IRWMP.

SECTION 3. This resolution shall become effective immediately upon adoption.

ADOPTED this June 21, 2005.


Elizabeth Pearson-Schneider, Mayor

ATTEST:


Martha Anderson, City Clerk

STATE OF CALIFORNIA)
) ss.
COUNTY OF ORANGE)

City of Laguna Niguel Resolution

RESOLUTION NO. 2005-811

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGUNA NIGUEL, CALIFORNIA, ACCEPTING THE SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the City of Laguna Niguel has the mission of protecting surface water quality in its service area and in carrying out this mission has, over the past several years, completed considerable work with respect to protecting and improving surface water quality within its jurisdiction; and

WHEREAS, the City has authorized its staff to participate in development of the South Orange County Integrated Regional Water Management Plan (Plan) pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, the City recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources and surface water quality are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to come together to integrate programs and projects that protect and enhance regional water supplies and water quality; and

WHEREAS, a regional water management group was formed in South Orange County, which included participation by the City, and was facilitated by the County of Orange; and

WHEREAS, said proceedings provide for the conceptual review and acceptance of the Plan, which includes programs and projects over which the agencies participating in the regional water management group have implementation authority; and

WHEREAS, the City Council of Laguna Niguel has reviewed the Plan in concept;

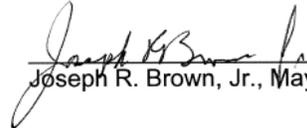
NOW, THEREFORE, BE RESOLVED, that the City Council of the City of Laguna Niguel accepts the Plan in concept for the purpose of moving forward with development

Resolution No. 2005-811

Page 2

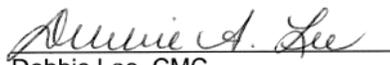
of implementation resources for the proposed projects and programs included therein, under the coordination of the County of Orange as the Administrator of the Plan.

PASSED, APPROVED AND ADOPTED this 7th day of June 2005.



Joseph R. Brown, Jr., Mayor

ATTEST:



Debbie Lee, CMC
City Clerk

City of Laguna Woods Resolution

RESOLUTION NO. 05-09

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGUNA WOODS, CALIFORNIA, ACCEPTING AND SUPPORTING THE ADOPTION OF THE SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the City of Laguna Woods has participated in the development and review of the South Orange County Integrated Regional Water Management Plan ("Plan") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that improved coordination among local agencies with responsibilities for managing water supplies and additional study of groundwater resources are necessary to maximize the quality and quantity of water available to meet the State's agricultural, domestic, industrial and environmental needs; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated quantity of water available to meet the State's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, said Plan was prepared in accordance with the Integrated Regional Water Management Planning Act of 2002; and

WHEREAS, a regional water management group was formed by written agreement in accordance with the Integrated Regional Water Management Planning Act of 2002; and

WHEREAS, a regional water management group was facilitated by the County of Orange; and

WHEREAS, said regional water management group provides for the approval and adoption of a Plan consisting of qualified programs and projects over which the participants in the regional water management group has authority to undertake.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LAGUNA WOODS, CALIFORNIA, DOES HEREBY RESOLVE, DECLARE, DETERMINE AND ORDER AS FOLLOWS:

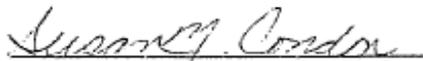
SECTION 1. That the above recitals are all true and correct.

SECTION 2. The South Orange County Integrated Regional Water Management Plan is hereby accepted for the purposes of moving forward with the proposed projects and programs included therein in continued coordination with the South Orange County Integrated Water Management and Governance Group, with the County of Orange as the Administrator of the Plan.

PASSED, APPROVED AND ADOPTED ON THE 15th DAY OF JUNE 2005.


Brenda B. Ross, Mayor

ATTEST:


SUSAN M. CONDON, City Clerk

STATE OF CALIFORNIA)
COUNTY OF ORANGE) ss.
CITY OF LAGUNA WOODS)

City of Mission Viejo Resolution

RESOLUTION 05-57

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MISSION VIEJO ACCEPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN"

WHEREAS, the City Council of the City of Mission Viejo has heretofore undertaken proceedings to review the South Orange County Integrated Regional Water Management Plan ("Plan") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by Governor Gray Davis on September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that improved coordination among local agencies with responsibilities for managing water supplies and additional study of groundwater resources are necessary to maximize the quality and quantity of water available to meet the State's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated regional water management plans, thereby maximizing the quality and quantity of water available to meet the State's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, a regional water management group was formed, facilitated by the County of Orange; and

WHEREAS, the regional water management group provides for the approval of said Plan consisting of qualified programs and projects, which the participants in the regional water management group have authority to undertake;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MISSION VIEJO DOES HEREBY RESOLVE, DETERMINE, AND ORDER AS FOLLOWS:

SECTION 1. That the above recitals are all true and correct.

SECTION 2. The South Orange County Integrated Regional Water Management Plan is hereby accepted for the purposes of moving forward with the proposed projects and programs included therein in continued coordination with the South Orange County Integrated Water Management and Governance Group, under the coordination with the County of Orange as the Administrator of the Plan.

SECTION 3. The City Clerk shall certify the adoption of this resolution.

South Orange County Integrated Regional Water Management Plan

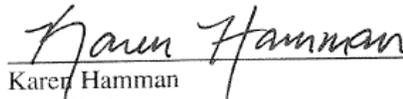
PASSED, APPROVED, AND ADOPTED this 6th day of June, 2005.


Trish Kelley
Mayor

I, KAREN HAMMAN, City Clerk of the City of Mission Viejo, hereby certify that the foregoing resolution was duly adopted by the City Council of the City of Mission Viejo at a regular meeting thereof, held on the 6th day of June, 2005, by the following vote of the Council:

AYES: Kelley, Ledesma, MacLean, Reavis, and Ury
NOES: None
ABSENT: None

ATTEST:

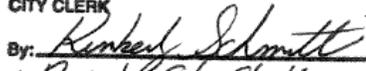

Karen Hamman
City Clerk

I hereby certify, under penalty of perjury, that the above and foregoing is a true and correct copy of:

Resolution 05-57

as adopted by the City Council of the City of Mission Viejo, California, on the 6th day of June, 2005.

CITY CLERK

By: 
Deputy City Clerk

City of San Clemente Resolution

RESOLUTION NO. 05-42

**A RESOLUTION OF THE CITY COUNCIL OF THE
CITY OF SAN CLEMENTE, CALIFORNIA,
ACCEPTING THE "SOUTH ORANGE COUNTY
INTEGRATED REGIONAL WATER MANAGEMENT
PLAN."**

WHEREAS, the City of San Clemente City Council has heretofore undertaken proceedings to review the South Orange County Integrated Regional Water Management Plan ("Plan") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that improved coordination among local agencies with responsibilities for managing water supplies and additional study of ground water resources are necessary to maximize the quality and quantity of water available to meet the state's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated regional water management plans, thereby maximizing the quality and quantity of water available to meet the state's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, said Plan was prepared in accordance with the Integrated Regional Water Management Planning Act of 2002; and

WHEREAS, a regional water management group was formed in South Orange County, facilitated by the County of Orange, in accordance with the Integrated Regional Water Management Act of 2002; and

WHEREAS, said proceedings provide for the adoption of the said Plan consisting of qualified programs and projects over which the participants in the regional water management group have authority to undertake; and

WHEREAS, the City Council has now reviewed said Plan with its staff and the general public at its regular City Council meeting on June 21, 2005.

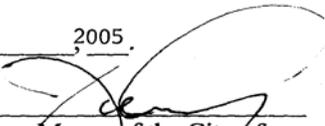
NOW, THEREFORE, The City Council of the City of San Clemente does hereby resolve as follows:

Section 1. The above recitals are true and correct.

Section 2. The South Orange County Integrated Regional Water Management Plan is hereby accepted.

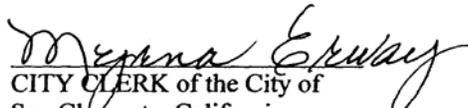
Section 3. The City Clerk shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

PASSED AND ADOPTED this 21st day of June, 2005.



Mayor of the City of
San Clemente, California

ATTEST:

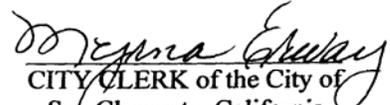


CITY CLERK of the City of
San Clemente, California

STATE OF CALIFORNIA)
COUNTY OF ORANGE) §
CITY OF SAN CLEMENTE)

I, MYRNA ERWAY, City Clerk of the City of San Clemente, California, do hereby certify that Resolution No. 05-42 was adopted at a regular meeting of the City Council of the City of San Clemente held on the 21st day of June, 2005, by the following vote:

- AYES: DAHL, DOREY, EGGLESTON, RITSCHEL, MAYOR ANDERSON
NOES: NONE
ABSENT: NONE



CITY CLERK of the City of
San Clemente, California

Approved as to form:



City Attorney

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County of Orange Resolution

RESOLUTION OF THE BOARD OF SUPERVISORS OF ORANGE COUNTY, CALIFORNIA

June 7, 2005

WHEREAS, a goal of the Resources and Development Management Department (RDMD) is to protect water quality and the beneficial uses of streams throughout Orange County; and

WHEREAS, RDMD has led development of the South Orange County Integrated Regional Water Management Plan ("SOC IRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, RDMD recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources is necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, the Legislature further declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to come together to integrate programs and projects that protect and enhance regional water resources; and

WHEREAS, a regional water management group was formed in South Orange County, and facilitated by the RDMD; and

WHEREAS, SB 1672 provides for the acceptance of the said Plan by participants in the regional water management group who have authority to implement the Plan; and

WHEREAS, the Board of Supervisors has now reviewed said Plan with its staff and general public at its regular Board meeting on June 7, 2005;

NOW, THEREFORE, BE IT RESOLVED that the Board of Supervisors accepts the South Orange County Integrated Regional Water Management Plan for the purposes of moving forward with

the proposed projects and programs included therein in continued coordination with the SOC IRWMP Management and Governance Group, with RDMD serving as Administrator of the Plan; and

BE IT RESOLVED, that the Director of the Resources and Development Management Department or his designee are hereby authorized and directed to submit, for and on behalf of the South Orange County Integrated Regional Water Management Group, an application for a Proposition 50 grant from the State Water Resources Control Board/California Department of Water Resources in an amount not to exceed \$50,000,000 for projects that will help provide a reliable water supply, protect and improve water quality, and achieve other multiple objectives in an efficient manner; and

BE IT RESOLVED, that the Board of Supervisors of the County of Orange hereby agrees and further does authorize the aforementioned representative or his designee to certify that the County of Orange has and will comply with all applicable state statutory and regulatory requirements related to any state grants received; and

BE IT FURTHER RESOLVED, that the Director of the Resources and Development Management Department or his designee are hereby authorized to negotiate and execute a grant contract on behalf of the South Orange County Integrated Regional Water Management Group.

The foregoing was passed and adopted by the following vote of the Orange County Board of Supervisors, on June 07, 2005, to wit:

AYES:	Supervisors:	THOMAS W. WILSON, LOU CORREA, JIM SILVA CHRIS NORBY, BILL CAMPBELL
NOES:	Supervisor(s):	
EXCUSED:	Supervisor(s):	
ABSTAINED:	Supervisor(s):	



CHAIRMAN

STATE OF CALIFORNIA)
)
COUNTY OF ORANGE)

Moulton Niguel Water District Resolution

RESOLUTION NO. 05-05

RESOLUTION OF THE BOARD OF DIRECTORS OF THE MOULTON NIGUEL WATER DISTRICT ACCEPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN"

WHEREAS, the Moulton Niguel Water District ("MNWD") includes within its mission the provision of a reliable water supply to the MNWD service area and in carrying out this particular mission over the past several years has completed considerable work with respect to improving water system reliability in South Orange County;

WHEREAS, MNWD recognizes that improved coordination among local agencies in South Orange County with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of imported water resources is necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs;

WHEREAS, the State of California Integrated Regional Water Management Planning Act of 2002, Senate Bill 1672 (SB 1672), implements a framework for local and regional agencies to collectively integrate programs and projects that protect and enhance regional water supplies and a system for grant funding such programs and projects under Proposition 50;

WHEREAS, a regional water management group, including MNWD, has been formed in South Orange County, facilitated by the County of Orange, along with the South Orange County Wastewater Authority and Municipal Water District of Orange County, to implement SB 1672 through the development of the "South Orange County Integrated Regional Water Management Plan" ("IRWMP"); and

WHEREAS, the MNWD Board of Directors has reviewed the IRWMP with its Staff and general public at regular Board meetings on June 14, 2005 and June 16, 2005.

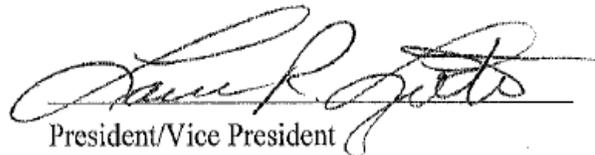
NOW, THEREFORE, the Board of Directors of Moulton Niguel Water District does hereby **RESOLVE, DETERMINE** and **ORDER** as follows:

Section. The foregoing recitals are true and correct and incorporated in this Resolution.

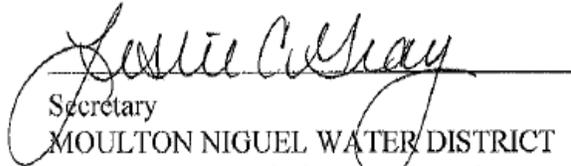
Section 2. The South Orange County Integrated Regional Water Management Plan is approved and supported by MNWD for the purposes of moving forward with the proposed projects and programs included therein in continued coordination with the IWRMP Management and Governance Group, under the coordination of the County of Orange as the Administrator of the plan.

Section 3. The Board of Directors of MNWD hereby approves and supports the filing of the IWRMP with the State of California Department of Water Resources, State Water Resources Control Board, State Department of Health Services, or CALFED, as appropriate.

ADOPTED, SIGNED and APPROVED this 16th day of June, 2005.



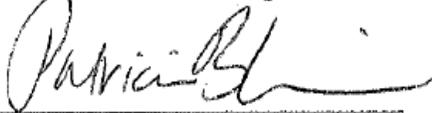
President/Vice President
MOULTON NIGUEL WATER DISTRICT
and of the Board of Directors thereof



Secretary
MOULTON NIGUEL WATER DISTRICT
and of the Board of Directors thereof

APPROVED AS TO FORM:

BOWIE, ARNESON, WILES & GIANNONE
Legal Counsel - Moulton Niguel Water District

By: 

Patricia B. Giannone

Resolutions of Adoption

City of Aliso Viejo

RESOLUTION NO. 2005 - 035

A RESOLUTION OF THE CITY COUNCIL OF ALISO VIEJO, CALIFORNIA, TO ADOPT THE SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, Senate Bill 1672 (Costa, Chapter 767, Statutes of 2002), Integrated Regional Water Management Planning, authorizes local public agencies to form regional water management groups and adopt regional plans to maximize the quality and quantity of water available by integrating programs and projects for the protection and enhancement of regional water supplies; and

WHEREAS, as part of the requirements to receive grant funds from Proposition 50, Chapter 8, Integrated Regional Water Management, a regional water management plan must be adopted; and

WHEREAS, a regional water management group, South Orange County Integrated Regional Water Management Group (Group) was formed in January 2005. The Group included participation by the City of Aliso Viejo, South Orange County cities, County agencies, and water and sewer utility agencies; and

WHEREAS, the Group has developed an Integrated Regional Water Management (IRWM) Plan that coordinates with existing plans and research documents provided by the participating agencies in a manner that identifies and integrates regional objectives, projects, and plans to improve water supply and quality; and

WHEREAS, the IRWM Plan is to be approved and adopted by each participating agency; and

WHEREAS, the County of Orange will file the IRWM Plan with the State of California Department of Water Resources, State Water Resources Control Board, State Department of Health Services, or CALFED, as appropriate.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF ALISO VIEJO DOES RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. Recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

Section 2. Approves and adopts the South Orange County IRWM Plan.

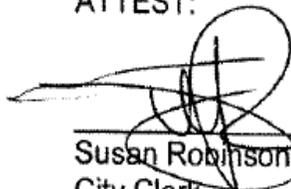
Section 3. The Mayor shall sign this Resolution and the City Clerk shall certify the adoption thereof.

PASSED, APPROVED and ADOPTED this 1st day of June 2005.



Karl P. Warkomski
Mayor

ATTEST:



Susan Robinson, CMC
City Clerk

City of San Juan Capistrano Resolution

RESOLUTION NO. 05-06-21-01



RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SAN JUAN
CAPISTRANO, CALIFORNIA, ADOPTING THE SOUTH ORANGE
COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the City of San Juan Capistrano ("CITY"), has the mission of providing a reliable water supply to its service area and in carrying out this mission has over the past several years completed considerable work with respect to improving water system reliability in South Orange County; and,

WHEREAS, the CITY is participating (along with 30 other retail agencies) in Metropolitan Water District of Southern California's Integrated Resources Plan to help ensure the continued reliability of supplies to Orange County and Southern California; and,

WHEREAS, the CITY has authorized its staff to participate in development of the South Orange County Integrated Regional Water Management Plan pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and,

WHEREAS, the CITY recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and,

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to come together to integrate programs and projects that protect and enhance regional water supplies; and,

WHEREAS, a regional water management group was formed in South Orange County, which included participation by the CITY and was facilitated by the County of Orange; and,

WHEREAS, said proceedings provide for the adoption of the said South Orange County Integrated Regional Water Management Plan consisting of qualified programs and projects over which the participants in the regional water management group have authority to undertake; and,

WHEREAS, the City Council of the City of San Juan Capistrano has now reviewed said South Orange County Integrated Regional Water Management Plan and

El Toro Water District Resolution

RESOLUTION NO. 05-6-3

RESOLUTION OF THE BOARD OF DIRECTORS OF EL TORO WATER DISTRICT, COUNTY OF ORANGE, CALIFORNIA, ADOPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN"

WHEREAS, the mission of the Board of Directors of the El Toro Water District ("ETWD"), includes providing reliable water supply and wastewater collection to its service area and in carrying out this mission has over the past several years completed several projects and programs in coordination with its neighboring agencies and Municipal Water District of Orange County ("MWDOC") for purpose of improving water system reliability in South Orange County; and

WHEREAS, ETWD participated in preparation of the South Orange County Water Reliability Study coordinated by MWDOC to document and ensure the continued reliability of supplies within its service area; and

WHEREAS, ETWD recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, ETWD has participated in development of the South Orange County Integrated Regional Water Management Plan ("SOCIRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, signed into law by the Governor on September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, a regional water management group was formed in South Orange County, which included participation by ETWD, and was facilitated by the County of Orange; and

WHEREAS, the ETWD Board of Directors has now reviewed the SOCIRWMP with its staff and general public at its regular Board meeting on June 23, 2005.

NOW, THEREFORE, be it resolved that the Board of Directors of the El Toro Water District does hereby adopt the South Orange County Integrated Regional Water Management Plan for the purposes of proceeding with the proposed projects and programs included therein in continued coordination with the SOCIRWMP Management Governance Group, and the County of Orange as the Administrator of the SOCIRWMP.

ADOPTED, SIGNED AND APPROVED this 23rd day of June 2005.



TED F. MARTIN, President
El Toro Water District and of
the Board of Directors thereof

(SEAL)

ATTEST:



MICHAEL P. GRANDY,
Secretary El Toro Water
District and of the Board of
Directors thereof

Municipal Water District of Orange County Resolution

RESOLUTION NO. 1768

**RESOLUTION OF THE BOARD OF DIRECTORS
MUNICIPAL WATER DISTRICT OF ORANGE COUNTY
ADOPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL
WATER MANAGEMENT PLAN"**

WHEREAS, the mission of the Municipal Water District of Orange County (MWDOC) is to provide a reliable supply of water to its service area and in carrying out this mission has consistently worked to improve system and supply reliability throughout Orange County; and

WHEREAS, MWDOC is coordinating the Orange County Regional Urban Water Management Plan, has completed the South Orange County Water Reliability Study, and is participating as an implementing entity (along with the 30 retail agencies we serve) in Metropolitan Water District of Southern California's Integrated Resources Plan, all of which will help ensure the continued reliability of supplies to Orange County; and

WHEREAS, MWDOC recognizes that improved coordination among local agencies with responsibilities for managing water supplies, development of additional local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the supplies available to meet the region's agricultural, urban, industrial, and environmental needs; and

WHEREAS, a regional water management group was formed in South Orange County, facilitated by the County of Orange and in which MWDOC is participating with the intent of developing an Integrated Regional Water Management Plan; and

WHEREAS, MWDOC staff has participated in the development of the South Orange County Integrated Regional Water Management Plan (SOC IRWMP), which was prepared in accordance with Senate Bill 1672 (SB 1672) of the State of California, known as the Integrated Regional Water Management Planning Act of 2002; and

NOW, THEREFORE, be it resolved that the Board of Directors of the Municipal Water District of Orange County does hereby adopt the South Orange County Integrated Regional Water Management Plan for the purposes of moving forward with the proposed projects and programs included therein and in continued coordination with the SOC IRWMP Management and Governance Group, under the coordination with the County of Orange as the Administrator of the SOC IRWMP.

Adopted at the regular meeting of the Board of Directors held June 15, 2005, by the following roll call vote:

AYES: Directors Bakall, Barbre, Clark, Finnegan, Hinman & Royce
NOES: None
ABSENT: Director Dick
ABSTAIN: None

I hereby certify that the foregoing is a true and correct copy of Resolution No. 1768 adopted by the Board of Directors of Municipal Water District of Orange County at its meeting held on June 15, 2005.

MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

By: Ed Royce
President

By: Maribel Goldsby
Secretary

San Juan Basin Authority Resolution

RESOLUTION NO. 05-06-01

**RESOLUTION OF THE BOARD OF DIRECTORS
SAN JUAN BASIN AUTHORITY
ADOPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL
WATER MANAGEMENT PLAN"**

WHEREAS, the mission of the San Juan Basin Authority (SJBA) is to develop and maintain a reliable, high quality, economical local water supply for the residents in the San Juan Basin by maximizing water use through management of local ground and surface water of San Juan Creek and its tributaries, with due consideration for preservation, enhancement, and conservation of the environment, including, but not limited to, the natural resources, fish and wildlife, infrastructure improvements, and the cultural heritage of the area; and

WHEREAS, a regional water management group was formed in South Orange County, facilitated by the County of Orange and in which SJBA is participating with the intent of developing an Integrated Regional Water Management Plan; and

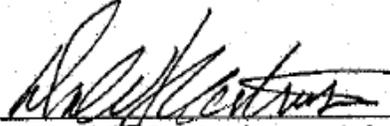
WHEREAS, SJBA staff has participated in the development of the South Orange County Integrated Regional Water Management Plan (SOC IRWMP), which was prepared in accordance with Senate Bill 1672 (SB 1672) of the State of California, known as the Integrated Regional Water Management Planning Act of 2002; and

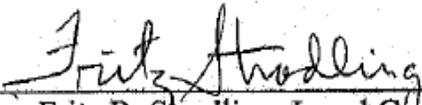
WHEREAS, the SJBA Board of Directors has now reviewed the SOC IRWMP with its staff and the general public at its Board of Directors meeting on June 21, 2005 and supports the plan and its goals.

NOW THEREFORE, be it resolved that the Board of Directors of the San Juan Basin Authority does hereby adopt the South Orange County Integrated Regional Water Management Plan for the purposes of moving forward with the proposed projects and programs included therein and in continued coordination with the SOC IRWMP Management and Governance Group, under the coordination with the County of Orange as the Administrator of the SOC IRWMP.

Passed and Adopted at the regular meeting of the Board of Directors held
June 21, 2005.

SAN JUAN BASIN AUTHORITY

By 
Donald J. Martinson, Administrator

By 
Fritz R. Stradling, Legal Counsel

Santa Margarita Water District Resolution

RESOLUTION NO. 05-05-07

RESOLUTION OF THE BOARD OF DIRECTORS OF SANTA MARGARITA WATER DISTRICT, COUNTY OF ORANGE, CALIFORNIA, ADOPTING THE “SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN”

WHEREAS, the mission of the Board of Directors of the Santa Margarita Water District (“SMWD”), includes providing reliable water supply and wastewater collection to its service area and in carrying out this mission has over the past several years has completed several projects and programs in coordination with its neighboring agencies and Municipal Water District of Orange County (“MWDOC”) for purpose of improving water system reliability in South Orange County; and

WHEREAS, SMWD participated in preparation of the South Orange County Water Reliability Study coordinated by MWDOC to document and ensure the continued reliability of supplies within its service area; and

WHEREAS, SMWD recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region’s agricultural, domestic, industrial, and environmental needs; and

WHEREAS, SMWD has participated in development of the South Orange County Integrated Regional Water Management Plan (“SOC IRWMP”) pursuant to Senate Bill 1672 (“SB 1672”) of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, signed into law by the Governor on September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to integrate programs and projects that protect and enhance regional water supplies; and

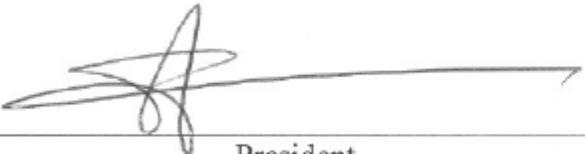
WHEREAS, a regional water management group was formed in South Orange County, which included participation by SMWD, and was facilitated by the County of Orange; and

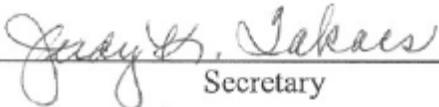
WHEREAS, the SMWD Board of Directors has now reviewed the SOC IRWMP with its staff and general public at its regular Board meeting on May 25, 2005.

NOW, THEREFORE, be it resolved that the Board of Directors of the Santa Margarita Water District does hereby adopt the South Orange County Integrated Regional Water Management Plan for the purposes of proceeding with the proposed projects and programs included therein in continued coordination with the SOC IRWMP Management and Governance Group, in coordination with the County of Orange as the Administrator of the SOC IRWMP.

ADOPTED, SIGNED AND APPROVED this 25th day of May 2005.

SANTA MARGARITA WATER DISTRICT

By:  _____
President

By:  _____
Secretary

South Coast Water District Resolution

SOUTH COAST WATER DISTRICT

RESOLUTION NO 19-04/05

A RESOLUTION OF THE BOARD OF DIRECTORS OF SOUTH COAST WATER DISTRICT ADOPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN"

WHEREAS, the Board of Directors of the South Coast Water District ("SCWD"), has heretofore undertaken proceedings to review the South Orange County Integrated Regional Water Management Plan ("Plan") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that improved coordination among local agencies with responsibilities for managing water supplies and additional study of groundwater resources are necessary to maximize the quality and quantity of water available to meet the state's agricultural, domestic, industrial and environmental needs; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 will facilitate the development of integrated regional water management plans, thereby maximizing the quality and quantity of water available to meet the state's water needs by providing a framework for local agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, said Plan was prepared in accordance with the Integrated Regional Water Management Planning Act of 2002; and

WHEREAS, a regional water management group was formed in South Orange County, facilitated by the County of Orange, in accordance with the Integrated Regional Water Management Planning Act of 2002; and

RESOLUTION NO. 19-04/05

WHEREAS, said proceedings provide for the adoption of the said Plan consisting of qualified programs and projects over which the participants in the regional water management group have authority to undertake; and

WHEREAS, the SCWD Board of Directors has now reviewed said Plan with its staff and the general public at its special Board meeting on June 21, 2005.

NOW, THEREFORE, the Board of Directors of South Coast Water District does hereby **RESOLVE** and **ORDER** as follows:

Section 1: The above recitals are all true and correct.

Section 2: The South Orange County Integrated Regional Water Management Plan is hereby approved.

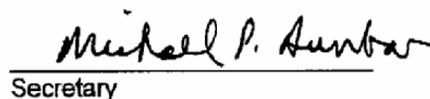
Section 3: It is hereby ordered that said Plan be filed with the State of California Department of Water Resources, State Water Resources Control Board, State Department of Health Services, or CALFED, as appropriate.

Section 4: The Secretary of SCWD is directed to certify the adoption of Resolution 19-04/05 and said Plan and to maintain a copy of the Plan and Resolution at the principal offices of SCWD.

PASSED AND ADOPTED at a special meeting of the Board of Directors of South Coast Water District held this 21st day of June 2005.


President

ATTEST:


Secretary

South Orange County Wastewater Authority Resolution

RESOLUTION NO. 2005-07

RESOLUTION OF THE BOARD OF DIRECTORS OF THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY (SOCWA), ADOPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN"

WHEREAS, SOCWA staff has participated in development of the South Orange County Integrated Regional Water Management Plan ("SOC IRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, SOCWA recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, the Legislature declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to come together to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, a regional water management group was formed in South Orange County, facilitated by the County of Orange and including SOCWA participation, with the intent of developing an Integrated Regional Water Management Plan; and

WHEREAS, SB 1672 provides for the adoption of Integrated Regional Water Management Plans, such as the SOC IRWMP, consisting of qualified programs and projects over which the participants in the regional water management group have authority to undertake; and

WHEREAS, the SOCWA Board of Directors has now reviewed the SOC IRWMP with its staff and the general public at its regular Board meeting on June 2, 2005.

NOW, THEREFORE, the Board of Directors of the South Orange County Wastewater Authority does hereby Resolve, Determine and Order as follows:

- Section 1. The above recitals are all true and correct.
- Section 2. The South Orange County Integrated Regional Water Management Plan is hereby approved for the purposes of moving forward with the proposed projects and programs included therein in continued coordination with the SOC IWRMP Management and Governance Group, under the coordination with the County of Orange as the Administrator of the Plan
- Section 3. It is hereby ordered that said Plan be filed with the State of California Department of Water Resources, State Water Resources Control Board, State Department of Health Services, or CALFED, as appropriate.
- Section 4. The Secretary of the Authority is directed to certify the adoption of Resolution 2005-07 and said Plan and to maintain a copy of the Plan and Resolution at the principal offices of the Authority.

ADOPTED, SIGNED AND APPROVED this 2nd day of June 2005.

SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

By: Robert W. Moore
Chairperson

By: David G. Lantz
Secretary

Trabuco Canyon Water District Resolution

RESOLUTION NO. 2005-1045

**RESOLUTION OF THE BOARD OF DIRECTORS OF
TRABUCO CANYON WATER DISTRICT, COUNTY OF ORANGE, CALIFORNIA,
ADOPTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER
MANAGEMENT PLAN"**

WHEREAS, the mission of the Board of Directors of the Trabuco Canyon Water District ("TCWD"), includes providing a reliable and high quality level of water and wastewater services in sufficient quantity for present and beneficial use to its service area and in conjunction with improving water system reliability to South Orange County; and

WHEREAS, TCWD participated in preparation of the South Orange County Water Reliability Study coordinated by MWDOC to document and ensure the continued reliability of supplies within its service area; and

WHEREAS, TCWD recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, TCWD has participated in development of the South Orange County Integrated Regional Water Management Plan ("SOC IRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, signed into law by the Governor on September 20, 2002; and

WHEREAS, the Legislature declared in SB 1672 that implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, a regional water management group was formed in South Orange County, which included participation by TCWD, and was facilitated by the County of Orange; and

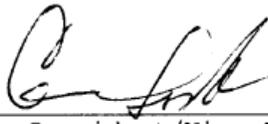
WHEREAS, the TCWD Board of Directors has now reviewed the SOC IRWMP with its staff and general public at its regular Board meeting on June 15, 2005.

NOW, THEREFORE, be it resolved that the Board of Directors of the Trabuco Canyon Water District does hereby adopt the South Orange County Integrated Regional Water Management Plan for the

purposes of proceeding with the proposed projects and programs included therein in continued coordination with the SOC IRWMP Management and Governance Group, in coordination with the County of Orange as the Administrator of the SOC IRWMP.

ADOPTED, SIGNED AND APPROVED this 15th day of June 2005.

TRABUCO CANYON WATER DISTRICT

By: 

President/Vice President

By: 

Secretary

Resolutions of Support

City of Laguna Hills Resolution

RESOLUTION NO. 2005-06-14-2

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LAGUNA HILLS, CALIFORNIA, SUPPORTING THE SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN

WHEREAS, the City Council of the City of Laguna Hills recognizes that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, Proposition 50, the Water Quality, Supply and Safe Drinking Water Projects, Coastal Purchase and Protection Act was passed by the voters in 2002, established a funding mechanism to improve water quality within integrated regional areas, and

WHEREAS, City staff has participated in development of the South Orange County Integrated Regional Water Management Plan ("SOC IRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, approved by the Governor on September 20, 2002; and

WHEREAS, the Legislature also declared in SB 1672 that the implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to come together to integrate programs and projects that protect and enhance regional water supplies.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LAGUNA HILLS, CALIFORNIA, DOES RESOLVE, DECLARE, DETERMINE, AND ORDER AS FOLLOWS:

SECTION 1. The South Orange County Integrated Regional Water Management Plan is hereby supported for the purposes of moving forward with the proposed projects and programs included therein in continued coordination with the SOC IRWMP Management and Governance Group, under the coordination with the County of Orange as the Administrator of the Plan.

PASSED, APPROVED, AND ADOPTED this 14TH day of June 2005.



RANDAL BRESSETTE, MAYOR

ATTEST:



MARY A. CARLSON, CITY CLERK

STATE OF CALIFORNIA)
COUNTY OF ORANGE) ss
CITY OF LAGUNA HILLS)

I, Mary A. Carlson, City Clerk of the City of Laguna Hills, California, DO HEREBY CERTIFY that the foregoing is a true and correct copy of Resolution No. 2005-06-14-2 adopted by the City Council of the City of Laguna Hills, California, at a Regular Meeting thereof held on the 14th day of June 2005, by the following vote:

AYES: Council Members Carruth, Lautenschleger, Songstad, Mayor Pro Tempore Scott, and Mayor Bressette

NOES: None

ABSENT: None

ABSTAIN: None

(SEAL)



MARY A. CARLSON, CITY CLERK

061405/dept/publicservices/char/agenda/citycouncil/IRWMP Resolution

City of Rancho Santa Margarita Resolution

RESOLUTION NO. 05-06-22-02

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RANCHO SANTA MARGARITA, CALIFORNIA, SUPPORTING THE "SOUTH ORANGE COUNTY INTEGRATED REGIONAL WATER MANAGEMENT PLAN"

WHEREAS, the Rancho Santa Margarita recognized that improved coordination among local agencies with responsibilities for managing water supplies, additional development of local resources, efficient utilization of existing resources and vigilant protection of our imported resources are necessary to maximize the quality and quantity of water available to meet the region's agricultural, domestic, industrial, and environmental needs; and

WHEREAS, the City has participated in development of the South Orange County Integrated Regional Water Management Plan ("SOC IRWMP") pursuant to Senate Bill 1672 ("SB 1672") of the State of California, known as the Integrated Regional Water Management Planning Act of 2002, signed into law by the Governor on September 20, 2002; and

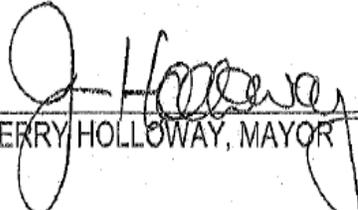
WHEREAS, the Legislature declared in SB 1672 that implementation of the Integrated Regional Water Management Planning Act of 2002 provides a framework for local and regional agencies to integrate programs and projects that protect and enhance regional water supplies; and

WHEREAS, a regional water management group was formed in South Orange County, which included participation by the City of Rancho Santa Margarita, and was facilitated by the County of Orange; and

WHEREAS, the City Council has now reviewed the SOC IRWMP with its staff and general public at its regular Board meeting on May 25, 2005.

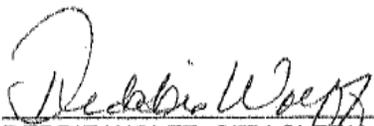
NOW, THEREFORE, be it resolved that the City Council of the City of Rancho Santa Margarita, California, does hereby support the South Orange County Integrated Regional Water Management Plan for the purposes of proceeding with the proposed projects and programs included therein in continued coordination with the SOC IRWMP Management and Governance Group, in coordination with the County of Orange as the Administrator of the SOC IRWMP.

PASSED, APPROVED AND ADOPTED this 22nd day of June, 2005.



JERRY HOLLOWAY, MAYOR

ATTEST:

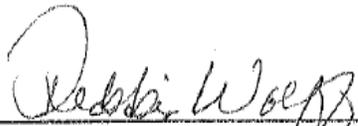


DEBBIE WOLFF, CITY CLERK

STATE OF CALIFORNIA)
COUNTY OF ORANGE) ss
CITY OF RANCHO SANTA MARGARITA)

I, Debbie Wolff, City Clerk of the City of Rancho Santa Margarita, California, DO HEREBY CERTIFY that the foregoing is a true and correct copy of Resolution No. 05-06-22-02 adopted by the City Council of the City of Rancho Santa Margarita, California, at a regular meeting thereof, held on the 22nd day of June, 2005, by the following vote:

AYES:	Council Members Beall, Blais and Thompson, and Mayor Pro Tempore Thor and Mayor Holloway
NOES:	None
ABSENT:	None
ABSTAIN:	None



DEBBIE WOLFF, CITY CLERK

WHEREAS, a regional water management group was formed in South Orange County, which included participation by ETWD, and was facilitated by the County of Orange; and

WHEREAS, the ETWD Board of Directors has now reviewed the SOCIRWMP with its staff and general public at its regular Board meeting on June 23, 2005.

-1-

NOW, THEREFORE, be it resolved that the Board of Directors of the El Toro Water District does hereby adopt the South Orange County Integrated Regional Water Management Plan for the purposes of proceeding with the proposed projects and programs included therein in continued coordination with the SOCIRWMP Management Governance Group, and the County of Orange as the Administrator of the SOCIRWMP.

ADOPTED, SIGNED AND APPROVED this 23rd day of June 2005.



TED F. MARTIN, President
El Toro Water District and of
the Board of Directors thereof

(SEAL)

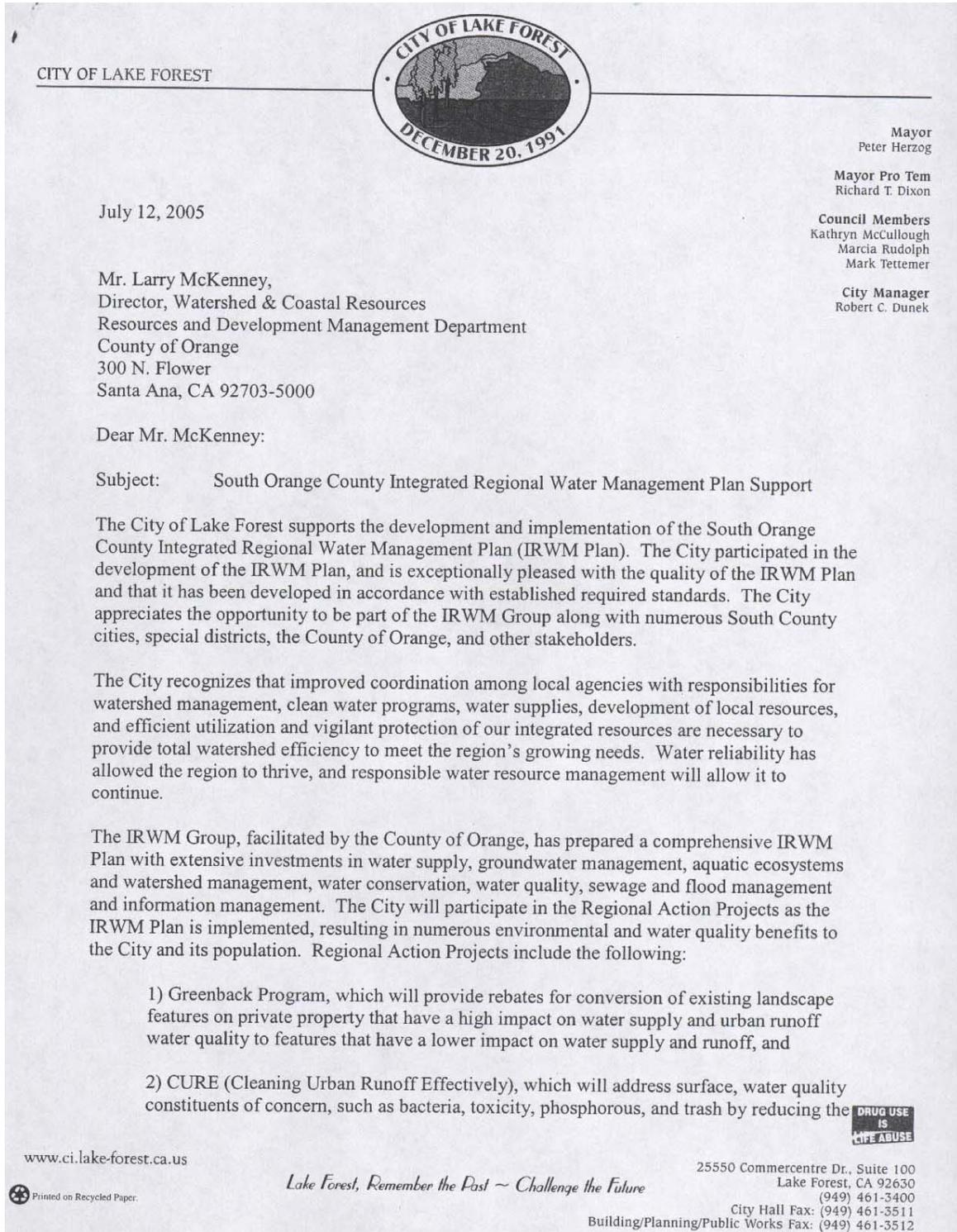
ATTEST:



MICHAEL P. GRANDY,
Secretary El Toro Water
District and of the Board of
Directors thereof

Letters of Support

City of Lake Forest Letter of Support

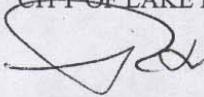


City of Lake Forest
July 12, 2005
Page 2

quantity of pollutants entering the storm drain through the construction and implementation of various best management practices.

The City looks forward to implementation of the IRWM Plan and the continued opportunity to participate in periodic updates to the IRWM Plan as necessary to respond to the changing environment.

Very truly yours,
CITY OF LAKE FOREST



Robert L. Woodings, P.E., Director of Public Works/City Engineer

cc: Robert C. Dunek, City Manager
Theodore G. Simon, P.E., Engineering Services Manager

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APPENDIX G

REGIONAL WATER SUPPLY PLANNING

Many factors affect future demands for water such as population growth, economic conditions, and hydrologic conditions. Historical water demand in Orange County is strongly related to land use and population. In general, as population increased, water demand increased. From 1970 to 1995, population increased 82% and water demand increased 55%. From 1995 to 2000, population increased an additional 10%, resulting in an overall growth from 1970 to 2000 of 101%. Water demand use increased 13% between 1995 and 2000, for an overall growth from 1970 to 2000 of 79%. The slower growth in water demand is primarily due to a change in land use from agriculture to urban/suburban and successful conservation efforts. Table G-1 below reflects historical population growth data obtained from the Center for Demographic Research (CDR).

Table G-1 – South Orange County Historical Population Growth⁷¹

South Orange County City	2000	2001	2002	2003	2004
City of Aliso Viejo		-	42,509	43,890	44,833
City of Dana Point	35,110	35,516	35,955	36,226	36,532
City of Laguna Beach	23,727	23,993	24,274	24,560	24,774
City of Laguna Hills	29,891	32,341	32,575	32,812	33,010
City of Laguna Niguel	61,891	62,763	63,479	65,054	65,669
City of Laguna Woods	17,794	17,939	18,066	18,197	18,287
City of Lake Forest	58,707	75,983	76,519	77,288	77,666
City of Mission Viejo	93,102	95,157	96,572	97,276	97,752
City of Rancho Santa Margarita	16,515	16,684	16,684	16,684	16,684
City of San Clemente	49,936	53,150	57,037	60,666	63,079
City of San Juan Capistrano	33,826	34,193	34,674	35,195	35,834

By estimating water demands over the next 20 years, water suppliers are ensuring that reliable and economic sources of water are available to their customers while protecting the watersheds, groundwater resources, surface water, and the ocean.

⁷¹ Center for Demographic Research, Population Data for Orange County Cities as of July 2004. Available online: <http://www.fullerton.edu/cdr/city.asp>. 3/1/05.

IMPORTED WATER

Imported Water Supply

Metropolitan Water District's (MWD) imported water system that serves South Orange County is principally supplied from the Colorado River Aqueduct and from the East Branch of the California Aqueduct. MWD serves South Orange County imported water through untreated and treated water distribution systems. South Orange County receives nearly all of its treated supply from the Diemer Filtration Plant located in Yorba Linda. This water is delivered primarily through the Allen McColloch Pipeline and the East Orange County Feeder No. 2. A small portion, approximately 4,346 acre feet per year of raw water, is treated by Trabuco Canyon Water District.

As the principal importer of water in Southern California, MWD's primary goal is to provide reliable water supplies to meet the water needs of its service area at the lowest possible cost. As existing imported water supplies from the Colorado River and State Water Project face increasing challenges, the reliability of deliveries from these sources continues to decline.

To address these challenges, MWD and its member agencies developed an Integrated Water Resources Plan (IRP) in 1996. The outcome was a "Preferred Resource Mix" which would ensure MWD and its member agencies would meet their full service retail demands without interruption through the year 2020.

The 1996 IRP Preferred Mix called for a diverse portfolio of imported supplies and locally developed resources. At first glance, local resources development may appear to benefit only the overlying areas that directly receive the produced water supply. However, they are in fact regional resources that provide benefits by offsetting regional imported water demands and making the net additional imported water available to the entire service area.

To achieve a balanced mix, the IRP set targets and committed funding and implementation plans for development of member agency wastewater recycling, and groundwater recovery supplies. MWD currently funds recycling and groundwater recovery projects through the Local Resources Program (LRP). The LRP is a performance-based incentive program and has been instrumental in helping the region implement the 1996 IRP local resource targets. Metropolitan has invested over \$121 million and partnered with member agencies on 53 recycling projects and 22 groundwater recovery projects. Member and retail agencies have also funded a significant number of local projects without Metropolitan funding, many of which pre-date MWD's LRP program.

The subsequent 2003 IRP Update, released by Metropolitan in 2004, had three objectives:

1. To review the goals and achievements of the 1996 IRP
2. To identify changed conditions for water resource development
3. To update the resource targets through 2025⁷²

⁷² MWD IRP Update, 2003. p. 35

Through regional planning, education and diversification, Metropolitan and its member agencies plan to continue to provide reliable service of imported water.

Imported Water Quality

The water delivered by Metropolitan in 2003 met all of the requirements for safe drinking water. This means that for more than 100 constituents that have to be monitored, none was found at levels considered unsafe by health agencies.

RECYCLED WATER

Recycled Water Supply

Some non-domestic water demands could be satisfied with additional recycled water supply, if the supply is economically feasible relative to existing and/or alternative sources of supply.

Water Recycling

Water recycling has long been regarded as a cost-effective water supply alternative in Orange County. Recycled water in the County is used to irrigate nursery crops, golf courses, parks, schools, business landscapes, residential lawns, and is also used for some industrial uses.

Local water recycling projects involve the collection of wastewater being discharged within the service area, treating that water to applicable standards for specific uses, and substituting the recycled water for existing or future potable water demands. The local agencies have pursued regionalization of the recycled systems to increase the use of recycled water and increase reliability.

Santa Margarita Water District has interconnects with Moulton Niguel and Irvine Ranch Water Districts. Additionally, Moulton Niguel is interconnected with South Coast Water District. Planning efforts are underway for construction of additional regional storage and interties including the addition of recycled water facilities at the South Orange County Wastewater Authority. Projections for expanded development of water recycling are based upon several assumptions that vary depending on the end use of the recycled water. Development of recycled water projects generally requires creative solutions to funding, regulatory requirements, institutional arrangements and public acceptance.⁷³

At a regional level, studies of water recycling opportunities within the southern California area provide a basis for promoting the development of water recycling plans. The Southern California Comprehensive Water Reclamation and Reuse Study analyzed 15 geographical areas for short term project implementation, two of which were located in South Orange County. The 'Upper Oso' short term implementation plan, as described by the study, indicates a need for regional agencies to continue to expand and connect the recycled water distribution systems as a collaborative effort. These agencies would include Santa Margarita

⁷³ Municipal Water District of Orange County, 2000, *Regional Urban Water Management Plan Update*.

Water District, El Toro Water District, Moulton Niguel Water District, and South Orange County Wastewater Authority. Sensitivity analyses for the ‘Upper Oso’ region demonstrated that this implementation plan would result in robust benefits remaining positive across a wide range of assumptions for estimated project costs or the avoided wastewater and water supply costs. The second region identified in the study was the ‘San Juan’ region, which includes the recycled water systems of the City of San Clemente, the City of San Juan Capistrano, the Santa Margarita Water District and the South Orange County Wastewater Authority. This region is also recommended to expand and connect the recycled water systems of the area to create a more reliable water supply. The net economic benefits are positive. However, there are issues that need resolution in the ‘San Juan’ region, including the equitable distribution of cost and flows from the Jay B. Latham Wastewater Treatment Plant, and the renovation of the facility itself, which is addressed in this Plan as a part of Chapter 4.

The Southern California Comprehensive Water Reclamation and Reuse Study also identified a long term strategy for the entirety of Orange County. The long term analysis in the Orange County region consisted of increasing reuse at six of the wastewater treatment facilities and one of the reservoirs in the area. This increased flow is expected to satisfy approximately 52,500 acre-feet per year of new demand by 2040. This goal is being used as a guideline for implementation of the local long-term strategy described in the report to establish connections between the seven treatment facilities and reservoirs located in South Orange County to create one regional system.⁷⁴

Some regional funding for system improvements and expansions is available through Metropolitan, which provides rebates for the development of cost-effective water recycling and groundwater recovery projects that reduce the demand for imported water supply and improves regional water supply reliability. Metropolitan is currently participating with MWDOC on three projects in South Orange County. They include the Moulton Niguel Water Reclamation Project, the Santa Margarita Water Reclamation Project, and the Trabuco Canyon Water Reclamation Expansion Project.

Recycled water use can also be increased by requiring dual piping in new developments, retrofitting existing landscaped areas, and constructing recycled water pumping stations, seasonal storage and transmission mains to reach areas far from treatment plants and balance annual demands. However, the additional costs, large energy requirements and new facility requirements make such projects very expensive to pursue. To optimize the use of recycled water, cost/benefit analysis must be conducted for each potential project. As previously discussed, the Southern California Comprehensive Water Reclamation and Reuse Study has shown that net benefits are far greater than direct costs.⁷⁵

⁷⁴ Department of Water Resources et.al., 2002, *Southern California Comprehensive Water Reclamation Study, Phase Two Final Report*.

⁷⁵ Municipal Water District of Orange County, 2000, *Regional Urban Water Management Plan Update*.

Recycled Water Quality

Recycled water processes in the Region are designed and operated in accordance with the requirements of Title 22 of the California Administrative Code (Water Reclamation Criteria) to treat the water to the appropriate level for the intended final use.

Concern agencies are monitoring for to continue use of recycled water in the future is the quality of recycled water as it relates to the amount of salts in the water, specifically chlorides. Salts are a natural byproduct of the reclamation process based on the salinity of the potable water. Normal wastewater treatment processes do not remove the salts. Elevated salt levels in recycled water are not deleterious to human health considerations. However, elevated salt levels (chlorides above 125 mg/l) may be harmful to certain plant materials, notably citrus trees, avocados, and certain turf grasses. The effects of recycled water with higher levels of salts can be mitigated through a variety of means. These can include periodic flushing of the soil with rain or the application of potable water, proper soil preparation to promote adequate drainage, and utilization of plant materials more tolerant of salt buildup.

Higher levels of salt content can affect the formation of Disinfection Byproducts. These higher levels of salt present in the potable water will also contribute to higher levels of residual salts in sewage and in the recycled water after treatment. Salinity increases tend to be higher where specific commercial or industrial processes add brines or with the use of water softeners that add salt to the discharge stream or where brackish groundwater is infiltrating into the sewer system. In addition, concern for the water quality in groundwater basins may lead to restrictions on the application of recycled water on lands overlying those basins.

These issues are exacerbated during times of drought, when the salinity of imported water supplies may increase, causing increased salinity in wastewater flows and recycled water. Basin management plans and recycled water customers may restrict the use of recycled water at a time when its use would be most valuable if it were of sufficient quality. For effective use of recycled water projects, therefore, it is important to control the salinity level of the Region's potable water sources and wastewater flows.

DESALTED WATER

Orange County is privileged with almost 40 miles of coastal shoreline, which means an abundant source of water, with a high salinity, is accessible to much of the county. Desalination is particularly important to South Orange County as a means to reduce dependence on imported water. The two types of processes for extrapolating salinity from water within South Orange County include ocean desalination and groundwater desalters.

Ocean Desalination Supply

MWD - The use of membrane technology and improved plant siting strategies have reduced costs for desalination, and may make seawater desalination a potential supply option for the

region. In 2001, MWD issued a competitive RFP for seawater desalination projects with the goal of developing up to 50,000 acre-feet per year. In light of the enthusiastic response to the proposals submitted under the RFP, Metropolitan revised their local resources target that can accommodate a seawater desalination goal of 150,000 acre-feet.⁷⁶

MWDOC - Previously, three desalination project sites were considered by MWDOC studies specifically for Orange County: Huntington Beach, San Juan Creek, and San Onofre. Both the Dana Point (San Juan Creek) and the San Onofre sites are in close proximity to the end users in South Orange County, providing greatly improved reliability for the supply. The treatment process at the desalination facility is expected to be reverse osmosis (RO). It is anticipated that the potable water recovery rate would be about 45% of the raw ocean supply rate.

Hydrogeology and water quality testing is being currently being conducted by the Municipal Water District of Orange County (MWDOC) at Doheny State Beach to study how water moves through the sandy sediments, and to better understand water quality issues near the mouth of San Juan Creek. This testing is the first of a 3-5 year effort to help determine the feasibility of locating an ocean water desalination plant in Dana Point adjacent to San Juan Creek. A desalination plant in Dana Point will not only provide a local source of water, it will also help reinforce system reliability even during an earthquake or other emergency.

The San Onofre site is the former site for the Unit One power generating unit at Southern California Edison (SCE) operated San Onofre Nuclear Generating Station (SONGS) at Camp Pendleton, just south of San Clemente. Unit One has been decommissioned and demolished, leaving two large diameter inactive ocean outfalls and an adjacent power source. A preliminary meeting with the U.S. Marine Corps is still required, as they provide a lease for the land to SCE.⁷⁷

The Huntington Beach site is currently being pursued by a private firm, Poseidon Resources Corporation, which has an agreement for power from AES and has planned to look for up to 50 mgd of “subscribers”, or customers, for desalinated ocean water meeting potable quality requirements. A major feature of this proposed private venture would be water exchange agreements that would include the regional provider, Metropolitan. The initially proposed plan for the Huntington Beach site also included studies of actual delivery of the ocean desalination product water through existing regional delivery pipelines to South Orange County, though completion of the project has yet to be finalized or approved.

The third potential site is currently owned the South Coast Water District. The 20-acre site is located at the mouth of the San Juan Creek approximately 1,500 feet from the ocean’s edge in Dana Point. Two types of have been identified for intake at this site: (1) conventional submerged intake systems, and (2) subsurface collector wells.

Another difficult issue is disposal of reject brine flows from the membrane desalting process. The South Orange County Wastewater Authority’s existing ocean outfall is situated adjacent

⁷⁶ MWD IRP Update, 2003. p. 35

⁷⁷ South Orange County Water Reliability Study, 2004 p.3-6

to this site and appears to have sufficient capacity to handle brine disposal flows from a 25 mgd desalination plant. Wastewater dispersion issues and marine organism impacts would need to be documented in the permitting process.

Delivery of water from the plant into the regional distribution system is relatively straight forward. Facilities would include a pump station, new connecting pipelines to the existing 30-inch Joint Regional Tri-Cities Transmission Main (JRTM) and the 27-inch Water Importation Pipeline (WIP). The ocean desalinated water would flow in both directions in both pipelines, with the zone of direct benefit varying with seasonal demands. The desalination project will provide approximately 1,300 acre-feet per year of water.

Ocean Desalination Quality

MWDOC - Product water quality goals currently being studied are based on the primary and secondary standards set by the California Department of Health Services. The expected treatment process at an ocean desalination facility in Orange County is reverse osmosis, with pretreatment and post-treatment.

Table G-2 lists the results of the proposed RO process. The projection is based upon 4-year old Koch TFC-SS (Seawater Extra High Rejection) membranes.

Table G-2 Ocean Desalination RO Results⁷⁸

Ion	Ocean Water Feed	Permeate	Brine Concentration
Ca ²⁺ (mg/L)	408	0.34	868
Mg ²⁺ (mg/L)	1,298	1.1	2,760
Na ⁺ (mg/L)	10,768	53	22,851
K ⁺ (mg/L)	388	2.5	823
HCO ₃ ⁻ (mg/L)	143	1.8	34
SO ₄ ²⁻ (mg/L)	2,702	2	5,960
Cl ⁻ (mg/L)	19,361	86	41,097
F ⁻ (mg/L)	1.3	0	3
TDS (mg/L)	35,014	146	74,416
PH	7.8	4.6	5.8

As shown, the RO permeate will consist essentially of sodium and chloride – no hardness or alkalinity to speak of. This causes the water to be corrosive. These problems are corrected by contacting the water with limestone and carbon dioxide to add calcium bicarbonate hardness and alkalinity. Interaction of the calcium with carbon dioxide dissolved in the desalted water facilitates dissolution of calcium and provides the alkalinity necessary to buffer the water and reduce its corrosiveness. Limestone contact is supplied in a limestone bed providing approximately 15 minutes of contact time.

⁷⁸ *MWDOC, 2003, Ocean Desalination Plant Feasibility Study*

Groundwater Desalter Water Supply

South Coast Water District – The South Coast Water District has plans to construct a groundwater desalter plant on the District’s San Juan Creek Property. The plant will provide groundwater recovery for potable supply from the San Juan Basin. San Juan Creek property is ready for Phase I site work and construction of the Groundwater Recovery Facility, following key acquisition of permit to connect access road to Stonehill Drive. Construction is expected to begin in June of 2005, with a start up date of January 2007. Initial production is expected to be 800 acre-feet, though the District hopes to expand to 2,000 acre-feet after acquiring additional water rights.⁷⁹

San Juan Basin Authority - The San Juan Basin Authority, in conjunction with the City of San Juan Capistrano, has initiated a desalter project, which is a two-phase construction plan for utilizing the groundwater for domestic water supply. Phase I facilities were recently completed in December 2004 and are currently producing potable water for the City of San Juan Capistrano. The Phase II facilities are still in the planning phase and require groundwater recharge facilities to supplement the natural process of recharge and streambed percolation in order to increase the diversion amounts to the desired levels.

Phase I is based upon a diversion of the average annual safe yield. The Basin is replenished during the wet years without the need for artificial recharge facilities. The primary objective of Phase I is to capture unused groundwater without inducing seawater intrusion.

On September 18, 2001, the City of San Juan Capistrano authorized the General Manager to enter into negotiations with Southwest Water Inc./ECO Resources, Inc. to design, construct, finance and provide long-term operation of the San Juan Basin Phase I Groundwater Recovery Plant (Project). In the Agreement, Southwest Water/ECO Resources agreed to build and operate a 5.14 mgd plant that will produce 4,800 af/y of drinking water, comparable in taste and total dissolved solids to the water currently purchased from Metropolitan.

The Project provides the City of San Juan Capistrano with 5.14 mgd, which is approximately 57% of the City’s average daily demand requirements. Additionally, and of greater value is the emergency storage capacity provided by the Project.

The Plant will continue to operate for a period of 20 years. Project objectives include the following; 1) reliability, both in terms of quality and quantity of water; and, 2) environmental compliance with the supplement to the 1995 expanded mitigated negative declaration for the Project. The facilities include the water wells, pipelines to convey water to the groundwater recovery plant site, the groundwater recovery plant itself, pump station, and necessary pipelines to convey water to the water distribution system, and pipeline to convey the desalting process concentrate to a point of connection with the SOCWA outfall for disposal.

⁷⁹ South Coast Water District, Michael Dunbar, Personal Communication, February 16, 2005.

Based on current groundwater modeling results, Phase I facilities will continue to produce a potable water supply of 4,800 acre-feet per year from sustained yield. Feedwater flow pumped from groundwater will continue to be approximately 5,000 acre-feet per year. Phase I controls groundwater gradients to minimize subsurface outflow to the ocean and provides seasonal storage capacity.

Future plans for Phase II of the project include expanding the desalter to 8 mgd with a total of 12 extraction wells, as well as the product water pipeline extension and pump station to the South County Pipeline. The Phase II facilities will increase production by at least 5,000 acre-feet per year and will have a treated project water yield of between 10,000 and 12,500 acre-feet per year based on the results of the monitoring program. A specified schedule will be completed for this phase following completion of monitoring and data reporting measures for Phase I. Completion of Phase II of the San Juan Desalter Project will provide sufficient pumping and desalting capacity for drought and emergency protection.

Groundwater Desalter Water Quality

The Groundwater Recovery Project operating in the San Juan Groundwater Basin pipes brackish groundwater to a reverse osmosis (RO) plant where the water is treated, micro-filtered, reverse osmosis and brought to potable water standards. The project consists primarily of two reverse osmosis treatment trains within an enclosed building; three iron/manganese filters, two desanders, and two cartridge filters; bulk chemical storage tanks within a semi-enclosed building; an approximately 85,000-gallon bolted steel tank for iron/manganese filter backwash water supply; an approximately 225,000-gallon bolted steel tank for spent backwash water recovery. The RO plant also includes all associated equipment, including pumps, motors, sumps, blowers and tanks to operate the treatment trains, filters, and desanders.

The Project provides a new source of water supply for the region through careful treatment of brackish groundwater. The raw water quality of the recovered water supply is measured at a sample point at the RO plant (downstream of the sandscreens) prior to any chemical treatment of the raw water by the operator, Southwest Water. The finished water meets all applicable State of California DHS drinking water standards. In addition to complying with applicable law, responsibility for meeting the standards for total dissolved solids, flavor, aroma, color, iron, manganese and corrosivity are required.

REGIONAL WATER QUALITY PROGRAMS

Orange County's potable water supply consistently meets and exceeds federal and state water quality standards. The quality reflects a high standard of service among the water retailers in the county. However, there is concern over the potential for contamination of imported water sources through various means.

Orange County's rapid urbanization has placed considerable stress on the quality of its local water resources. With the paving of earthen surfaces and the building of roads and parking lots, surface water has significantly increased in quantity and decreased in quality. Urban

runoff and pollutant discharge permitting, discussed in more detail below, became the responsibility of local government jurisdictions as a part of the National Pollutant Discharge Elimination System (NPDES) permit process of the Clean Water Act in 1990. Since that time, the County of Orange, the cities within Orange County, and the Orange County Flood Control District have cooperatively developed and implemented a comprehensive Drainage Area Management Plan (DAMP) to reduce pollutants, enhance water quality, educate the public, and monitor the progress in improving water quality. This effort produced a three tiered approach to protecting and enhancing Orange County's water resources: pollution prevention, source controls, and treatment controls. This tactical program is designed to comprehensively improve the quality of surface water, which directly influences the quality of local groundwater supplies and ocean water. The many programs and information generated through the cooperation of the co-permittees illustrates the commitment of the region to dramatically increase regional water quality.

Orange County Stormwater Program

Education is the foundation of the Orange County Stormwater Program. Changing perspectives and behaviors is not easy, especially in an area as diverse as Orange County. Since the third-term NPDES permits were issued in 2002, an advertising media campaign has been in full swing, including public announcements featuring rubber ducks to link activities at home to ocean pollution, and newspaper ads showing how common activities such as car washing can contaminate the ocean. A materials campaign and a school campaign have also been developed and implemented across Orange County to help initiate the behavioral change required to improve water quality.

The Orange County Stormwater Program also initiated municipal, commercial, industrial, and construction inspections to ensure the implementation of both Pollution Prevention and Source Control Best Management Practices (BMPs). The BMPs were specifically designed for categories of businesses, such as auto repair shops, restaurants and nurseries, and are provided as fact sheets of practices that will reduce pollutants entering local waterways.⁸⁰ The County of Orange, the cities, and the Orange County Flood District have also recently completed a study to identify regional BMP retrofitting opportunities to further pursue regional projects for water quality improvement. In the 2004 report, 18 opportunities for BMP retrofits were recognized in the South Orange County region, which will be reviewed in the near future before entering the planning process. They include seven projects on County land, six in Mission Viejo, one in Lake Forest, one in San Juan Capistrano, and one in Laguna Niguel.⁸¹

A number of treatment controls, including BMPs such as vegetated swales, detention basins, constructed wetlands, infiltration trenches, and media filters have already been designed and implemented in Orange County over the last several years. In the 2003-2004 Stormwater Progress Report, a number of activities were initiated, marking the first year of full implementation of the program that was substantially revised to meet the requirements of the

⁸⁰ Orange County Stormwater Program, 2003, *Progress in 2002-2003 Annual Report*.

⁸¹ Orange County Stormwater Program, 2004, *Identification of Regional BMP Retrofitting Opportunities Draft*.

Third Term NPDES Permits. Notable programmatic accomplishments that occurred during the reporting period include:

- Implementation of a re-aligned management framework, including a new Trash and Debris Task Force, and major resource commitments to advancing stormwater science.
- Commencement and completion of special planning studies to evaluate the effectiveness and applicability of various treatment BMPs.
- Implementation of new program requirements for New Development/Significant Redevelopment Program.
- Development of enhanced cooperative local agency procedures and practice for sewage spill response.
- Full implementation of the Third Term Permit water quality monitoring program
- Development and implementation of the DAMP/Watershed Chapters in the San Diego Regional Board area.
- Development and implementation of formalized training elements across a number of program areas.

While direct evidence of the connection between programmatic activities and improving environmental condition remains elusive, the Permittees believe that there is strong evidence of increasing program effectiveness. Indeed, compared to the previous reporting period, the 2004 Program Effectiveness Assessment shows:

- Significantly increased participation by the Permittees in the General Permittee Committee and supporting management framework.
- A significant increase in program investment (up from a reported \$54.4 million in the prior reporting period to \$64.8 million in 2003-2004) by the Permittees.
- A 35% increase in the amount of household hazardous waste (up from 4,238,534 pounds to 5,741,522 pounds) taken to collection centers.
- A reduction in the total amount of nitrogen fertilizer applied to public land (down from 413,000 pounds to 407,000 pounds of nitrogen).
- The achievement of 45,000,000 impressions in the Countywide public education effort compared to the 37,000,000 impressions in the 2002-2003 reporting period.
- Marked increases in enforcement activity arising from the inspection of industrial and commercial premises.
- Marked increases in the number of complaints investigated by the Permittees and use of the enforcement tools provided by the Permittees' local Water Quality Ordinances.⁸²

The quality of surface water within the South Orange County watersheds is a significant contributor to the regional ecosystem. Pollutant loads in the watersheds resulting from urban runoff jeopardize the stability of native species, contribute to human health risks, and reduce the potential for potable and non-potable water usage. As runoff flows over urban areas, it picks up harmful pollutants such as pathogens, sediment, fertilizers, pesticides, heavy metals, and petroleum products. These pollutants often become dissolved or suspended in urban runoff and are conveyed and discharged to receiving waters such as streams, lakes, lagoons,

⁸² Orange County Stormwater Program, 2004, *Unified Annual Progress Report (San Diego Region)*.

bays and the ocean. Clearly, a comprehensive effort to improve surface water quality is vital to the region, as many of the projects discussed in Chapter 4 reflect.

Each of the watersheds in South Orange County is within the jurisdiction of the San Diego Regional Water Quality Control Board. The term “Watershed Permittees” refers to the County of Orange, the Orange County Flood Control District, and the respective cities located within each watershed. NPDES permits are issued for a five-year term and have generally followed a progressive pattern. During the second permit term, Orange County invested heavily in parallel efforts to implement a watershed approach, a comprehensive planning tool for addressing water quality as well as habitat restoration, recreation, and flood control. In the third term, further improvements have been made to the stormwater program. Due to the complexity of the third term permits, Local Implementation Plans were created to provide for a jurisdiction-specific plan within the broader policy and program framework of the DAMP. A more extensive monitoring effort was developed as well.⁸³

Wet Weather Monitoring Program

Details on development and implementation of the wet weather monitoring program are included in DAMP Section 11.0 - Exhibit 11-I. The Third Term Permit wet weather monitoring program includes the following components:

- Urban stream bioassessment -Using a “triad” of indicators (bioassessment, chemistry, toxicity), describe impacts on stream communities and the relationship of impacts to runoff, based on comparisons with reference locations on a year-to-year time frame;
- Long-term mass loading -Using measurements of key pollutants, measure loads over a time frame of years to decades to compare with past and present levels;
- Coastal storm drains -Using a suite of bacterial indicators at high priority drain outfalls, track compliance with regulatory standards and any improvements due to BMP implementation; and
- Coastal receiving waters -Using measurement of runoff plume characteristics and extent, as well as measures of a suite of physical, chemical, and biological indicators, improve understanding of the impacts of runoff plumes on near-shore ecosystems.

Dry Weather Monitoring Program

Details on development and implementation of the dry weather monitoring program are included in DAMP Section 11.0 - Exhibit 11-II. The Third Term Permit dry weather monitoring program includes the following three main components:

- A set of randomly located stations intended to characterize the average area wide conditions in urban runoff;
- A set of rotating targeted stations intended to provide additional information about specific sites thought to have a high potential for contaminated runoff and to provide coverage of the entire MS4 system over the period of the permit term; and

⁸³ Orange County Stormwater Program, 2004, Unified Annual Progress Report (San Diego Region).

- A set of criteria that will trigger focused ID/IC (illegal discharge and illicit connection) studies by the Permittees when the monitoring data indicate the presence of a problem.⁸⁴

It should be noted that currently, surface waters in South Orange County watersheds are rarely utilized as sources of potable or non-potable water; however, they are an important element as a recreational opportunities and provide a significant economic resource for the area. Nevertheless, as the region diversifies its water sources in the future, surface water may play an increasingly important role in water supply.

⁸⁴ Orange County Stormwater Program, 2004, *Watershed Annual Report*

APPENDIX H

SOUTH ORANGE COUNTY IRWM PLAN PROJECT DESCRIPTIONS

WATER SUPPLY PROJECTS

San Clemente – Well No. 8

The City of San Clemente is proposing to install a new groundwater well, including drilling, casing installation, pump, motor, electrical, communication, and civil work. The project will provide a source of potable water supply to the City of San Clemente, which will increase water reliability and reduce dependency on imported water.

San Clemente – Recycled Water Expansion

The project consists of expanding the City's reclamation treatment and distribution systems. The expansion consists of increasing the treatment system by 2.2 mgd, a new 2.5 mg reservoir, pump station, and distribution pipelines. An interconnection with Santa Margarita Water District's recycled water system is also included. The interconnection will improve supplier recycled water reliability, as well as allow for future storage of excess recycled water in a planned storage facility. The City's water reclamation plant is currently capable of treating 2.2 mgd with a maximum month demand of 1.91 mgd. Currently, the recycled water is used for sewage treatment plant process water and irrigation of 2 golf courses. The expansion will connect an additional golf course, parks, medians, slopes and schools within the City's service area. With this expansion, total recycled water use will increase by 870 AF/YR to 2,300 AF/YR. If planned regional seasonal storage is constructed for recycled water, the City has recycled water treatment capabilities to produce 4,500 AF/YR of recycled water. The project will prevent the potential for loss of landscaping if water rationing is required in drought conditions. The project will specifically increase supply reliability and reclamation activities on a citywide level.

San Juan Basin Authority – Galivan Basin Desalter

The project would create new potable/non-potable water supply by diverting surface water from Oso Creek and storing it in a portion of the existing Galivan Retarding Basin for subsequent conveyance and treatment with a small desalter to be built at Moulton Niguel Water District's existing 3-A Treatment Facilities. The Galivan basin extends along the west side of Oso Creek Channel from Crown Valley Parkway to 1,000 feet upstream of Camino Capistrano, in the City of Laguna Niguel, in Orange County. Oso Creek is tributary to Trabuco Creek and thence San Juan Creek that ultimately discharges into the Pacific Ocean at Dana Point.

The flow in Oso Creek has been increasing over the last few decades as a result of rapid urbanization and increasing imported water runoff. Oso Creek water quality (and the quality of groundwater in the shallow aquifer system beneath the creek) is the poorest in the entire San Juan Basin, with total dissolved solids concentrations higher than in other subbasins. Surface and sub-surface inflow from Oso Creek (and the underlying shallow aquifer system)

into the lower San Juan Basin adversely impacts the overall groundwater quality of the basin. To prevent poor quality water from mixing with the water supply in the lower San Juan Groundwater Basin, the project would capture and treat the Oso Creek flows. Thus project benefits would include enhanced water supply as well as improved surface and groundwater quality.

The Galivan Basin Desalter Project will improve the water quality of Oso Creek and the lower San Juan Groundwater basin, and potentially improve wetlands and wildlife habitat within the Galivan Basin. This should also improve the aesthetics of the Galivan Basin as viewed from the neighboring community.

Water supply reliability would be improved by the diversion, capture and treatment of return irrigation flows. Treatment of the surface and subsurface Oso Creek water will improve both the groundwater quality thereby increasing water storage potential, and the quality of downstream watershed ecosystems through cleaner surface water. Removal of contaminant and other non-point source pollutants through the diversion will improve all beneficial uses and habitats. Actual construction of the desalter would include removal of non-native plants and the potential creation of seasonal wetlands and enhancement of riparian habitat within a portion of the Galivan Basin. Existing conditions along Oso Creek would be protected by managing and maintaining sufficient surface flows in Oso Creek to sustain existing riparian corridors and fish and wildlife habitat.

City of San Juan Capistrano – Well No. 5 and Cooks Wells Development

The City proposes to develop 3 new non-domestic wells in the San Juan Basin. San Juan Capistrano Well No. 5 is an existing well which will require rehabilitation and construction of an iron and manganese removal facility. The development of the two Cooks Wells will require drilling of two new wells and installation of iron and manganese removal facilities on each. All three wells are expected to produce at a rate of 500-700 gpm or up to 1 MGD per well.

This project will develop local groundwater sources for non-domestic use. Development of local supply reliability will protect the community from drought and will reduce dependence on imported water. The project also addresses groundwater management by increasing production of groundwater resources in the San Juan Basin. Through treatment techniques, this project takes previously unused water and makes it available for non-domestic use. A recent study has already identified consumers for such water in the area. This project will also increase stormwater capture and storage in the San Juan Basin by making more aquifer space available for recharge.

Ultimately, the project will provide health, environmental, and overall safety benefits through the development of local water supplies and reduction of iron and manganese contamination. Development of local water supplies aids environmental and recreation concerns in areas where imported water is supplied from.

Santa Margarita Water District – Gobernadora Multipurpose Basin

The Santa Margarita Water District (SMWD) proposes to construct the Gobernadora Multipurpose Basin (Basin) to respond to water quality degradation due to urban run-off, erosion and sedimentation along Gobernadora Creek, high storm flows damaging the downstream restoration habitat area, and excessive surface and groundwater originating upstream. Canada Gobernadora is a sub-basin (Basin Number 1.24) within the San Juan Creek Watershed (Watershed), the upper portion of Canada Gobernadora has been developed over the past two decades as the community of Coto de Caza.

The Basin will consist of a storm detention basin that will be established as a wetland and riparian habitat, an infiltration gallery to capture and divert non-native flows for re-use, a pump station and pipeline. The Basin will be utilized to capture and naturally treat urban runoff and storm flows to 1) reduce downstream erosion and sedimentation, 2) address excessive surface and groundwater, and 3) improve the water quality in the Gobernadora Creek and San Juan Creek.

Successful implementation of the Basin is anticipated to result in the reaching the following goals:

1. Attenuation of storm flows, reduction of soil erosion and sedimentation, and removal of excess surface and groundwater. These problems that are currently damaging Gobernadora Creek and the Gobernadora Ecological Resource Area (GERA), and present obstacles to the restoration of Gobernadora Creek advocated by the participants in the Special Area Management Plan (SAMP) and Natural Communities Conservation Plan (NCCP), including state and federal resource agencies, are a concern to the Army Corps of Engineers.
2. Higher quality of water, specifically a reduction in total Coliform, Biological Oxygen Demand (BOD), total solids, ammonia, nitrogen and phosphates utilizing natural vegetated treatment methods instead of chemicals.
3. Protection of beneficial uses of the Basin, including contact and non-contact recreation, cold and warm freshwater habitat, and wildlife habitat.
4. Reduce demand for imported water by capture and reuse of a valuable water resource decreasing the need to utilize domestic water for nonpotable purposes.

The methodology behind storm detention basins and water treatment is scientifically justified, with the Basin possessing proven constructed wetlands technology to increase the water quality in Canada Gobernadora for collection and reuse in the irrigation system. The project will include a fully developed and implemented monitoring program, in accordance with an approved Monitoring Plan, to measure water quality conditions, load reduction monitoring, water quantity, wetland and natural habitat monitoring, and assess the environmental health of the watershed. Water quality samples will be taken during dry weather and minor storm events in strategic locations to accurately demonstrate the effectiveness of desired pollution reduction and water quality measures of the project. Monitoring will measure significant watershed improvements by removing nutrients by the use of a natural system mitigating urban runoff, reducing pollution, and reducing creek degradation. The Basin project will also demonstrate the value of low maintenance bioengineering and BMPs.

Thus, the construction of the basin will reach the goals of dramatically improving supply reliability by collecting and storing storm water supplies for irrigation. Construction will also include the creation of wetlands to protect the existing wetlands and other watershed ecosystems, and treat non-point source pollution, adding to the goals of ecosystem protection and enhancement.

South Coast Water District – Water Harvesting on Aliso Creek

The proposed project deploys *Mobile Urban Runoff Filtration* technology to intercept and treat contaminated urban runoff from Aliso Creek, and produce a high purity recycled water product, which will be integrated into the existing Coastal Treatment Plant Reclaimed Water System serving South Laguna, Dana Point and Capistrano Beach. When blended with tertiary treated wastewater, TDS in the recycled water will be improved. The South Coast Water District currently imports approximately 7500 acre feet of potable water on a yearly basis. That translates to approximately 6.7 million gallons per day. This water originates in the Northern California and the Colorado River watersheds, and is transported to Southern California through a series of aqueducts. It is estimated that the proposed system would provide approximately 0.5 million gallons per day, reducing the demand for potable water by approximately 7% and significantly reducing demands on agricultural water rights.

The new water supply created by the proposed project is expected to create a market for high quality recycled water in South Coast Water District's communities – attracting customers who have not previously utilized recycled water because of its high salt content. Additional surplus volumes of the new water will be marketed through a series of interconnected trunk lines among inland water districts to supplement their existing and future demands. The proposed capture and treatment of contaminated urban runoff will provide a template for efforts throughout the region to reduce and reuse abandoned urban runoff as a new water resource that will reduce demands on potable water resources. An additional benefit of reducing urban runoff from Aliso Creek will be improved coastal water quality and fewer closures of public beaches in the area.

The project will expressly address water supply reliability and efficiency through the capture, treatment, and use of urban runoff by eliminating non-point source contaminants and improving surface water quality. Decreased urban runoff from the creek will also promote healthy downstream ecosystems in the watershed.

County of Orange – Water Harvesting and Re-Use at Laguna Niguel Regional Park

This project will investigate the feasibility of harvesting urban runoff water from storm drains along Sulphur Creek, and using the water for landscape irrigation at Laguna Niguel Regional Park. Active use areas within the park are irrigated turfgrass, requiring irrigation of up to four acre-feet per acre annually. Approximately half of the 20-acre active use area of the Regional Park is currently irrigated with recycled water, while the other half is irrigated with potable water. Sulphur Creek runs through the middle of the Park and is fed by major storm drain outfalls at several points. The storm drains serve several square miles of residential and commercial development and provide constant year-round flows, primarily from landscape irrigation runoff. Flow monitoring data accumulated between 2001 and 2005

have demonstrated that dry-weather low flow rates are easily sufficient to provide for all irrigation needs at the park. The feasibility investigation will look at harvesting, storage and distribution mechanisms; filtration or other treatments that may be necessary to produce water of sufficient quality for distribution through the existing irrigation system; possibilities for blending of harvested water with existing recycled water distribution lines; environmental implications; implementation responsibility; and cost-effectiveness. If fully implemented, the reduction in water demand would be approximately 40 acre-feet per year, half of which would be reduction in demand for importation of potable water supply. Other benefits of the Project would be reducing non-seasonal discharge of nuisance runoff to Sulphur Creek with associated reduction in discharge of urban pollutants.

South Orange County Wastewater Authority – J.B. Latham Treatment Plant – Advanced Water Treatment Project

The South Orange County Wastewater Authority proposes to design and construct an 11 million gallon per day advanced water treatment facility at the J.B. Latham Regional Wastewater Treatment Plant in Dana Point, Orange County. The project would be constructed in three phases with the possibility of three participating owners. The project would provide recycled water for a variety of uses, thus, reducing potable water use. In addition, the project would provide water for groundwater basin recharge use and recycled water for irrigation at various sites. Efficient irrigation will foster recreational uses, such as golf courses, parks, schools, medians, and other landscaped areas. The project will also significantly reduce the amount of secondary treated wastewater effluent containing bacteria that is disposed of in the ocean at Doheny State Beach in Dana Point.

The plant will expand water supply reliability by reducing the amount of reusable water being discharged to the ocean, and provide a new source for non-domestic uses. Such reclamation is an important aspect of overall watershed management, providing a potential supply for basin recharge and water quality improvements as well. This facility would also reduce the amount of bacteria laden secondary treated effluent, which is discharged to the ocean through the San Juan Creek Ocean Outfall. The reduction in outfall discharge may help to improve the quality of the ocean water adjacent to the outfall which discharges 2 miles off Doheny Beach in Dana Point, a widely used beach area in the south part of Orange County.

City of San Juan Capistrano – San Juan Basin Recharge

The City of San Juan Capistrano proposes to recharge the San Juan Basin at a maximum rate of 7,500 acre-feet per year. The total land area required would be on the order of 25 acres. This land will be concentrated along Trabuco and San Juan Creeks and includes City-owned property, while some must be acquired. Recharge water supply will be pumped into the basin and will be from sources such as retained stormwater, recycled water or in some cases imported water purchased at incentive prices.

This project is supported by the San Juan Basin Groundwater Management Plan. The plan represents the first step in the implementation of the City and the San Juan Basin Authority's mission to develop and maintain reliable, good quality, and economical local water supply for the residents in the San Juan Basin by maximizing use of local ground and surface water,

the San Juan Creek and its tributaries. The project considers the preservation and enhancement of the environment, in terms of natural resources, fish and wildlife, infrastructure improvements and the cultural heritage of the area. Furthermore, the introduction of retention and settling ponds offers an opportunity to create additional wetland areas.

Groundwater recharge and management is the express purpose of this project. These activities include issues of water quality improvements in the groundwater basin, development of local water supply reliability reducing demand on the Bay Delta and Colorado River, and the capture and storage of stormwater runoff, which in turn advances overall watershed management efforts as well.

Trabuco Canyon Water District – Groundwater Treatment Plant

Trabuco Canyon Water District proposes the Groundwater Treatment Plant project, which consists of a surface water treatment plant designed for this purpose in 2000 and the clearwell storage reservoir described in the land use plan for the proposed site completed by URS in 2003. The proposed treatment facility consists of contact clarification-filtration units, sodium hypochlorite disinfection, polymer and alum storage tanks and associated feed facilities, chlorine contact basin and clearwell storage reservoir, booster pump station, filter backwash handling facilities and a waste backwash storage. The new facility and clearwell reservoir will be located on property presently owned by the District and reserved for this purpose. The current status of the project is that the plant design and the area plan and site feasibility study are complete. The clearwell reservoir and system connection construction plans have not been completed at this time.

This project addresses maintenance of existing groundwater production capabilities and avoidance of imported water requirements resulting from the loss of the existing groundwater production capabilities. The estimated reduction in imported water is determined through actual water production records and through hydrology studies by URS Corporation establishing the validity of the average yield of the project.

Trabuco Canyon Water District – Reclaimed Water

Trabuco Canyon Water District proposes the Reclaimed Water Project. The project will add one new service area pressure zone and increase the service area and customer base of two existing pressure zones. The project expansions will serve to build out the planned reclaimed water delivery system and provide maximum utilization of reclaimed water production. The project addresses present and future reclaimed water overproduction delivery issues and provides a positive reduction in Colorado River water demand. Demand reduction will be measured by customer service meter additions to the reclaimed water delivery system. The estimated reduction in imported water use was determined through the planned system build-out analysis of the wastewater collection and reclaimed water delivery systems in the TCWD Master Plan completed by Montgomery Watson in 1999. Careful analysis was performed to separate out the future irrigation demands and plan for a delivery system to serve future planned areas, as well as existing irrigation areas not served presently with reclaimed water.

Overall, the project seeks to improve water reliability by enhancing local supplies through expanding the wastewater treatment system distribution line. The project will also provide reclaimed water for irrigation.

City of Dana Point – Salt Creek Treatment Plant – Phase II Water Recycling Facility

The City of Dana Point proposes Phase II of the Salt Creek Treatment Plant, which includes the final design and construction of a desalination treatment facility to produce water which meets recycled water quality standards for turf irrigation purposes. The source water is urban runoff that has been treated by Phase I of the project, the Salt Creek Ozone Treatment Plant.

The project provides environmental benefits by utilizing an existing resource that historically contributed to water quality impairments, treating it and using it as recycled water for irrigation purposes, supporting water conservation and reuse. Indirectly this project will contribute to water quality improvements at the beaches, and thus improving recreational opportunities. The planning and implementation of this project will also help to increase awareness regarding urban runoff and its impact, water conservation needs and options for water reuse. This project may also promote a sense of stewardship to the public for its watershed.

This project aims to provide additional treatment (desalination) to the treated urban runoff so that it can be used as recycled water for irrigation purposes in lieu of sending potentially valuable water resources back to the Ocean.

Moulton Niguel Water District Phase 5 Recycled Water Distribution System Expansion

MNWD proposes Phase 5 of its recycled water distribution system, which will expand the distribution lines to deliver up to 1,400 acre-feet per year of recycled water to 272 existing landscape irrigation services. The distribution conveyance system will supply recycled throughout MNWD service area, increasing the annual recycled water use within the district from 9,800 acre-feet per year to 11,200 acre-feet per year. The project will reduce dependence upon imported water, improve water reliability locally, regionally, and statewide, and reduce secondary effluent discharge to ocean, and reduce fertilizer application for landscape.

El Toro Water District, Moulton Niguel Water District, and Irvine Ranch Water District – Joint Recycled Water Treatment and Distribution System

The El Toro Water District, Irvine Ranch Water District and Moulton Niguel Water District provide domestic water, non-potable water, and sanitary wastewater collection/treatment services to a collective population of more than 530,000 in service area that includes the cities of Aliso Viejo, Irvine, Lake Forest, Laguna Hills, Laguna Niguel, Laguna Woods and Mission Viejo. Each District has identified non-potable water demands in their service areas that could be satisfied with additional recycled water supply, if the supply is economically feasible relative to existing and/or alternative sources of supply. In taking a regional approach to satisfying water demands and conserving water resources in south Orange County, the three districts will share resources and costs to make a potential project work.

The ETWD, IRWD, and MNWD Recycled Water Project (Project) is a regional recycled water project that will provide treatment and distribution facilities for a combined demand of 4,313 acre-feet per year within the three districts' service areas. The regional recycled water system will service portions of the cities of Laguna Niguel, Laguna Hills, Laguna Woods, Lake Forest, Irvine, Mission Viejo, and Aliso Viejo.

The Project will develop a 5.0 mgd Advanced Water Treatment Plant at the site of the existing El Toro Water District Water Recycling Plant. The Project will also include the construction of a 3,500 gallon per minute (gpm) Recycled Water Effluent Pump Station, rehabilitation of 7,200 linear feet of a 21-inch RCP transmission pipeline, construction of 3,000 linear feet of a 16-inch HDPE pipeline, a small distribution system pump station, and approximately 22,000 linear feet of distribution pipelines ranging in diameter from 4 to 10 inches.

The specifics of this Project include the reuse of 4,313 acre feet per year of which 2,730 acre-feet of recycled water would be conveyed to IRWD, 1,000 acre feet to MNWD, and 583 acre feet to ETWD. This project directly offsets the need for imported water supplies from MWD thus providing benefits to the Sacramento-San Joaquin Delta and Colorado River. This Project will provide an opportunity for customers that use high valued imported water for non-potable purposes such as landscape irrigation, commercial, and industrial use; to instead take advantage of using recycled water. Given ETWD's dependence on imported water and the potential for planned and/or unplanned interruptions to conveyance system, ETWD believes it is critical that local water supply resources be created and developed. Recycled water is beneficial in many ways including: providing economic benefit to districts that develop recycled water supplies, reducing the demand for imported water from Sacramento-San Joaquin Delta and Colorado River, reducing the discharge of treated effluent to the ocean, and providing a reliable source of water for non-potable purposes.

City of San Juan Capistrano – Recycled Water Transmission System Improvements

The San Juan Capistrano Recycled Water Transmission System Improvements Project will construct transmission mains and a recycled water reservoir as the next phase of improvements to the recycled water system, distributing approximately 4,000 AFY to areas in San Juan Capistrano not currently served by a reclaimed water source. The City currently has an existing system with an estimated value of \$4,140,000, which serves Zones 20 and 30 and is supplied by Non-Domestic Wells. This project proposes improvements that will serve Zone 40 and Zone 10, the largest and most demanding areas for recycled water in the City of San Juan Capistrano. These Zones will be supplied by the proposed Latham Recycled Water Plant.

The City of San Juan Capistrano's 2000 Recycled Water Master Plan identified customers with an average day demand of 4,688 acre feet of recycled water and low quality groundwater. The use of recycled and local non-domestic water will reduce demand on domestic water and reduce the overall cost of service to the City's customers. The Master Plan recommended construction of \$44,366,000 in non-domestic facilities, including approximately \$14,000,000 for the construction of a recycled water plant at the South Orange

County Wastewater Authority operated J.B. Latham Plant Sanitary Sewer Treatment Plant. The project need is supported by the City's Water Master Plan.

Ultimately, this project aims to distribute local groundwater and recycled water sources for non-domestic use. In addition, the Project will significantly contribute to the development of local supply reliability will protect the community from drought and will reduce dependence on imported water. Distribution of recycled water may lead to a reduction of non-domestic well use in the area, increasing the available groundwater supplies for domestic water use through treatment. This improves groundwater banking programs, and reduces imported water from the Bay Delta and Colorado River.

Santa Margarita Water District – South Orange County Emergency Storage Reservoirs – Phase I Upper Chiquita Canyon Reservoir

Santa Margarita Water District proposes to construct an emergency storage reservoir as a Santa Margarita Water District and the Municipal Water District of Orange County propose to construct two emergency storage reservoirs as a component of the ongoing South County Reliability Plan to serve emergency needs of City of San Juan Capistrano, City of San Clemente, South Coast Water District, Moulton Niguel Water District, Trabuco Canyon Water District and Santa Margarita Water District. The reservoirs will be located in Chiquita Canyon in South Orange County, east of the City of Mission Viejo and North of the City of San Juan Capistrano. The emergency storage reservoirs will hold potable water for emergency demands and enhanced security.

The reservoirs are a key component of the South Orange County Water Reliability Study which developed a list of projects to bolster water reliability to accommodate planned importation shutdowns for seven average days as well as contingency planning for emergency shutdowns of up to 31 days of summer demand. The project goal is to ensure water supply reliability for emergency occurrences. Since the majority of South Orange County's water supply comes from imported water, the excess storage of water will provide an emergency supply in times of unforeseen circumstances. The Project will also allow an alternative source of water to be provided in the case of failure of the major imported water connection.

El Toro Water District – Water Transmission Line Crossing Protection

El Toro Water District proposes to protect a critical, exposed and vulnerable 18" and 24" potable water transmission pipeline and encasement that cross under Reach-2 of Aliso Creek. Construction consists of restoring the concrete encasement to the elevation 474.4 feet established in 1995. The existing concrete structure will be recapped with 3,250 psi concrete to just one-half inch below finished grade. A ½ inch thick steel plate will be placed and anchored to the concrete structure. In addition, a grouted riprap apron on the Aliso Creek invert will be constructed immediately downstream of the structure to replace the ungrouted riprap that has been washed away.

The project prevents interruptions to potable water service resulting from continued erosion/down cutting of Aliso Creek upper reach inverts and slopes. In addition, the project

ensures that normal service and emergency storage is available to portions of import water dependent communities of Lake Forest, Mission Viejo, Laguna Hills, Laguna Woods and Aliso Viejo. The project prevents water quality degradation within Aliso Creek.

WATER CONSERVATION PROJECTS

Municipal Water District of Orange County – SmarTimer Water Use Efficiency Program Expansion

The lack of regular landscape irrigation scheduling adjustments, poor irrigation system maintenance and faulty landscape design all contribute to excess irrigation in urban landscapes and nuisance runoff that conveys pollutants such as bacterial, fertilizers, herbicides and pesticides into our natural waterways.

In South Orange County approximately 179,000 single-family homes and 10,000 commercial landscapes use irrigation timers to manage landscape irrigation (210,851 sf homes X 85%). These timers require regular irrigation scheduling adjustments by the site manager to assure sufficient irrigation water is applied throughout the year. In general, irrigation schedules programmed into these timers are more generous than needed and are not frequently adjusted causing excess irrigation and nuisance runoff..

Smart irrigation timers that automatically adjust irrigation schedules, based on recent weather changes, have been proven to save water and reduce both irrigation runoff and non-point source pollution (Residential Runoff Reduction Study, July 2004). Water agencies throughout California are looking to smart irrigation timers to achieve significant landscape water savings. In addition, Orange County surface water quality managers including the County and Cities also recognize smart timers as an effective tool to reduce nuisance runoff and pollution.

Poorly maintained irrigation systems and poorly designed landscapes also contribute to excess irrigation and nuisance runoff. Characteristics of poorly maintained irrigation systems include broken and miss-directed sprinkler heads, excess pressure, miss-matched precipitation rates between sprinklers while characteristics of poorly designed landscapes include stretched sprinkler spacing, mixed-hydrozones and inappropriate plant selections.

A two-pronged approach is needed to comprehensively address these problems in existing landscapes. First, installation of smart self-adjusting irrigation timers will provide for regular irrigation scheduling adjustments based on recent weather changes. It is anticipated that once the smart timers begin to apply the proper amount of water from an irrigation scheduling perspective the need for an ancillary program to improve the distribution uniformity, how evenly the irrigation system applies irrigation water, will be needed and will gain an additional increment of water savings. For example, if the distribution uniformity of an irrigation system is improved from 60% to 70% water use can be decreased by 10%. And second, a Landscape Improvement Program targeting improvements to irrigation systems and correction landscape designs flaws will renovate the systems and designs improving the overall efficiency.

The Municipal Water District of Orange County was awarded a Proposition 13 grant to conduct a pilot implementation program, known as the SmarTimer Rebate Program, to begin testing a rebate implementation methodology as a final step toward regional program

implementation. This pilot implementation SmarTimer Rebate Program will be implemented from late 2004 to early 2006.

Following this pilot implementation program, the first phase of a standard implementation program is proposed South Orange County Integrated Regional Watershed Management Plan targeting 2,000 smart timer installations in single-family homes and commercial landscapes. As implementation experience is gained and better savings data becomes available from the City of Laguna Niguel Green Back Program it is anticipated that and Landscape Improvement component will be included in Phase II of the Smart Irrigation Timer Program.

Retrofit Potential and Water Savings

In the South Orange County Integrated Regional Watershed Management Group a total of 179,000 single-family homes and 10,000 commercial landscape sites can be retrofitted to smart irrigation control (assumes 85% of all single-family homes and 100% of dedicated landscape meters). Commercial landscapes include city streetscapes, community parks, homeowner association common area and public facilities. Based on water savings rates identified in the Residential Runoff Reduction Study, these retrofits could save more than 13,500 acre-feet of water each year (assumes 41 gallons per day per single-family home and 545 gallons per day per commercial landscape).

While firm estimates are not yet available it is anticipated that nearly all sites will have some sort of maintenance or design flaw. Water savings from the Landscape Improvement Program will be estimated through an evaluation of the City of Laguna Niguel Green Back Program, however, landscape improvement savings is anticipate to be significant.

Phased Implementation

In October of 2004, the Municipal Water District of Orange County in cooperation with its 29 member agencies began a pilot implementation program, known as the SmarTimer Rebate Program, offering commercial landscape owners and single-family homeowners rebate incentives to replace their antiquated irrigation timers with smart timers that automatically adjust the irrigation schedule as weather changes throughout the year. The purpose of this pilot program is to establish a rebate program in Orange County including program participation guidelines and applications; hire administration contractors; create an approved list of irrigation controller technologies; graphic design, layout and printing of program marketing materials; construction of a project tracking database.

Following the pilot implementation program currently underway, Phase I, as shown in Table 1, is proposed by the South Orange County Integrated Regional Water Management Group targeting 2,000 smart timer installations in single-family homes and commercial landscapes. Table 2 provides the economic analysis summary and indicates that the program will result in savings per AF of \$242 per AF and will save 7,130 over the 10-year life of the program.

Subsequent phases are also anticipated increasing to 3,000 or more retrofits per phase. In addition to smart timers, Phase II will also include a Landscape Improvement Program

targeting irrigation system distribution uniformity improvements to increase the efficiency of irrigation systems and landscape design flaw such as mixed hydrozones and poor plant selections.

Table 1			
Project Phase	Retrofit Goal		Annual Acre-feet Water Savings
	Smart Timers (3)	Landscape Improvements (4)	
Pilot Implementation (1)	700	--	250
Phase I (proposed) (2)	2,000	--	713
Future Phases beyond current proposal			
Phase II	3,000	250	1,119 (1,100 + 19)
Phase III	3,000	500	1,138 (1,100 + 38)
Phase IV	3,000	500	1,138 (1,100 + 38)
Phase V	3,000	500	1,138 (1,100 + 38)

- (1) Pilot Implementation currently underway.
- (2) Phase I implementation currently proposed
- (3) Assumes 55% Commercial and 45% residential irrigation timer installations and water savings of 545 and 41 gallons per day respectively.
- (4) Assumes 68 gallons per day savings per site for the Landscape Improvement Program (Green Back Program).

Table 2		
South Orange County Integrated Regional Water Management Plan		
SmarTimer Irrigation Controller Program Cost Analysis		
	\$/unit or gpd savings	South County Proposal (1)
Retrofits		
Residential		900
Commercial		1,100
AF Savings (10 year lifecycle)		
Residential	41.2	415
Commercial	545	<u>6,715</u>
Total Savings		7,130
Costs		
Administration	\$125	\$138,400
Rebate Incentives:		
Residential (10 valves/clock; \$30/valve)	\$300	\$270,000
Commercial (irrigated acres/clock = 1.2 X \$1,000 = \$1,200)	\$1,200	\$1,320,000
Total Costs:		\$1,728,400
Funding		
Prop 50 Request		\$1,009,900
Local Match (Metropolitan CCP \$):		
Residential	\$65	\$58,500
Commercial (irrigated acres/clock = 1.2 X \$500 = \$600)	\$600	\$660,000
Total Funding:		\$1,728,400
Cost Per Acre Foot Saved		
Prop 50		\$ 142
Match		\$ 101
Total Project		\$ 242
(1) El Toro WD, Laguna Beach CWD, Moulton Niguel WD, San Clemente, San Juan Capistrano, Santa Margarita WD, South Coast WD, and Trabuco Canyon WD		

Trabuco Canyon Water District – Water Filter Backwash Water Recovery Project

The Trabuco Canyon Water District owns and operates the La Canada Water Treatment Plant, a conventional surface water treatment plant with a capacity of 6 cubic feet per second (cfs). Imported surface water from the Colorado River is treated at the WTP. The WTP utilizes a conventional treatment process consisting of coagulation, clarification, mixed media filtration, followed by disinfection. As part of the treatment process, periodic flushing of the clarifier and backwashing of the filters is performed using treated water. The wastewater generated during the flushing and backwashing process is combined and temporarily stored on-site in the waste wash water storage tank and gradually disposed of to the sewer. Under current regulations, a percentage of the waste wash water can be recovered and returned to the influent of the WTP, if there is no impact to the plant's treatment performance and its ability to meet drinking water guidelines.

Currently, the waste wash water generated at the La Canada WTP contains solids from the treatment process that may re-enter the plant and increase disinfection byproducts (DBPs) and turbidity in the plant effluent. Approximately 3.3 % of treated domestic water is used to generate the waste wash water that is disposed of to the sewer. Through the design and construction of a waste wash water recovery system, small package plant, a significant amount of the wastewater can be recovered and returned to the influent of the WTP. The project consists of installing a packaged treatment system that will remove a significant amount of the solids, a source of DBP precursors and turbidity.

Recovery of this waste wash water is expected to reduce imported Colorado River water demand by approximately 200 acre feet annually, if up to 90 percent of the current waste wash water is recovered. This estimated amount was determined through an engineering study conducted, which also developed design criteria, site layout, and construction cost estimates.

The project would conserve water that is currently wasted into the sewer by treating it through several processes and allowing most of the water to be recovered and returned to the raw water influent to the plant. Thus, this project would conserve more of the existing water supply.

City of Dana Point – Xeriscape Demonstration Garden at Harry Otsubo Community Garden

The City plans to revegetate approximately 700 square feet of the Harry Otsubo Community Garden to plant a demonstration xeriscape garden. The xeriscape garden will showcase a number of different themes (looks) to promote the use of xeriscape gardens. The project will also include educational signage showcasing the xeriscape plants and their water conservation and environmental benefits.

The Otsubo Community Gardens offer a unique experience for residents to have a garden when their residence may not provide an opportunity for a garden or for the garden enthusiast

to showcase their gardening expertise in a community setting. City residents are able to lease one of two-sized plots for a low yearly fee (\$35-75/year). This program has been very successful and there is a waiting list for the plots. This project will increase awareness of the benefits and looks of xeriscape plants to garden enthusiasts, which may be a new concept to some.

The project supports water conservation, efficient water use, reduction of urban runoff from irrigation, and improving runoff water quality by reducing the use of fertilizers and pesticides that can be discharged in runoff impacting aquatic habitats and beneficial recreational use.

GreenBack Landscape Renewal Rebates - Municipal Water District of Orange County (Adminstrating Agency)

The GreenBack Landscape Renewal Rebates Program program is aimed at encouraging the structural conversion of existing landscape features on *private properties* (residences, businesses, and homeowner associations) that have a high impact on water supply and urban runoff water quality to features that have a lower impact on water supply and runoff quality. A partial rebate would be offered to private landowners for the construction of such multipurpose retrofits as changing thirsty lawns to drought-tolerant groundcovers or to inert permeable surfacings, modifying irrigation systems to conserve water and reduce spray or runoff onto pavements, and/or implementing other cost-effective structural BMPs that reduce watering needs and nuisance/stormflow and pollutant runoff. Local cost share would be derived from the each participating private landowner who would be responsible for all design and maintenance and for a share of the construction cost. Each participating city within the Region would be allotted a share of available rebate funds during each project cycle to be used for private sector projects at residences, businesses, and homeowner associations in accordance with GreenBack program guidelines. The regional GreenBack program is expected to be administered by the Municipal Water District of Orange County and to be promoted in conjunction with MWDOC's SmarTimer Water Use Efficiency Program.

The proposed GreenBack program concept is a relatively new concept. A comparable feasibility-level pilot project is the one under way for 2005-06 in the cities of Laguna Niguel and Laguna Hills. The feasibility-level pilot project is developing preliminary criteria for rebate eligibility, program publicity, rebate claim procedures, and program performance evaluation. In the first phase of the regionalized program, results of the feasibility-level pilot project will be evaluated to determine how it may best be adapted and upscaled into an effective regionally expanded program, and how it may be integrated into the ongoing SmarTimer effort. The adapted regionalized GreenBack guidelines will then be field tested in an initial limited rollout of rebate availability to verify the public's response to the rebate system. Successive annual rollouts of rebate funding will be fine-tuned at each stage to improve multipurpose performance.

The project will reduce regional reliance on imported water, as well as reduce urban runoff through water use efficiency. The renewed landscapes will also require less fertilizer and pesticide application, and will promote on-site infiltration of stormwater, improving

watershed ecosystem health. Water meter readings will be used to document reductions in water usage, and all project sites will be photographically documented.

South Orange County Integrated Regional Water Management Group - Demand, Runoff & Pollution Prevention (DRPP) Regional Action Project

The Demand, Runoff and Pollution Prevention (DRPP) Regional Action Project encourages the structural conversion of existing landscape features that have a high impact on water supply and urban runoff water quality to landscape features that have a lower impact on water supply and runoff quality. The DRPP Regional Action Project is targeted at converting landscaping at municipal facilities to implement environmentally friendly re-landscaping projects. Several cities in the Region have already begun to convert parts of their public landscape, and the Region's water districts are also encouraging drought-tolerant landscaping among their customer base. The DRPP Project would formalize and expand upon these efforts. The DRPP project sites will serve as demonstration projects to publicize and encourage similar retrofits throughout the public and private sector in all the participating communities.

The centerpiece of the Project is a partial rebate incentive, to be made available regionally, for retrofits such as changing thirsty lawns to drought-tolerant groundcovers or to inert permeable surfacings; modifying irrigation systems to conserve water and reduce spray or runoff onto pavements; and/or implementing other cost-effective structural BMPs that reduce watering needs, nuisance water flows, and pollutant runoff.

The Project also features water quality benefits by reducing urban runoff quantity and improving urban runoff quality by reducing the application of pollutants such as nutrient-rich fertilizers, toxic pesticides and bacteria-laden grass clippings that impact aquatic habitats and beneficial recreational use. To the extent that lawn-mowing activity is reduced, the project will also reduce production of green wastes, energy consumption, and noise/air pollution caused by lawnmowers and blowers. In those cases where landscaping is replaced with inert materials drawn out of the solid waste stream (such as composted mulch products or recycled crumb rubber used to backfill synthetic grass installations), the project also supports statewide recycling goals and reduces strains on landfill capacity. Because large areas of the region are tributary to receiving waters listed as impaired for bacteria, nutrients and/or toxicity, the DRPP projects will be a component of TMDL implementation.

The DRPP Regional Action Project will build upon an existing rebate incentive pilot project already under way in the cities of Laguna Niguel and Laguna Hills using a Proposition 13 Non-Point Source Pollution Control Program grant. The framework established by the existing project will be adapted for the DRPP project as a regionally expanded program.

Proposed Public Sector DRPP Projects

The following is a partial list of public sector sites projected to be re-landscaped under the guidelines of the DRPP Regional Action Project within the next five years. Other projects are expected to be added in succeeding years at the option of the participating public sector agencies, subject to the availability of funding. Projects nominated for any competitive cycles

of DRPP grant funding will be vetted against performance guidelines that require reduction in water, fertilizer and pesticide demand through site design; reduction in water waste through improved irrigation system efficiency; and reduction in stormwater runoff through incorporation of structural Best Management Practices.

Laguna Niguel DRPP Project Site – Bear Brand Park Soccer Field Synthetic Grass Installation Project

One existing soccer field and two baseball fields totaling approximately 2.75 acres will be converted from irrigated turf grass to non-irrigated synthetic grass under this project, meeting the goals of increasing regional water supply reliability. Conversion to synthetic turf grass is a proven method of water conservation, thus serving as the scientific basis for the project. Annual water savings will be approximately 11 acre-feet. Recreational access will be improved because the fields will be able to be used continuously for more hours on a daily basis all year, instead of being shut down weekly for maintenance and annually for turf renovation. The project will also eliminate application of nitrogen and phosphorus fertilizers and pesticides to the soccer field environment, reduce green waste sent to landfills, and reduce energy usage and noise pollution from mowing. Additionally, precipitation will percolate immediately into the highly-permeable surface, instead of creating runoff. This directly benefits the Salt Creek sub-watershed, improving the riparian and ocean habitats of its drainage path. Previous similar projects by Laguna Niguel indicate that the 10-year lifecycle cost of synthetic grass is equivalent to natural grass but with superior performance. Maintenance records for the park will be reviewed to evaluate reductions in water, fertilizers, and pesticides use.

Laguna Hills DRPP Project Site– Oso Parkway Median Island Water Conservation Project

The Oso Parkway project involves the complete removal of high water use and high fertilizer use turf grass in this 1.2 mile long, 1.84 acre median island between Moulton Parkway and Bridlewood Drive in the southern portion of the City of Laguna Hills. Currently, this median approximately consumes 7 AF of water per year. Turf substitutions are a tried and true method of effective water conservation and serves as the scientific basis for the project. The construction of this project is expected to save 5.5 AF of water each year, thus it will meet the goals of water conservation and enhanced water supply reliability. The replacement of the turf will be with a combination of pervious surfaces and low water use landscape materials. The irrigation system will also be updated and the use of low water emitting irrigation systems and evapotranspiration (ET) controllers will be evaluated for potential use.

Laguna Hills DRPP Project Site - Moulton Parkway Median Island Water Conservation Project

The Moulton Parkway project involves the complete removal of high water use and high fertilizer use turf grass in this one mile, 1.37 acre median island between Via Lomas Street and north of Glenwood Avenue in the western portion of the City of Laguna Hills. Currently, this median approximately consumes 5.5 AF of water per year. The construction of this project is expected to save 4 AF of water each year, thus it will meet the goals of water conservation and enhanced water supply reliability. The replacement of the turf will be with a combination of hardscape and low water using landscape materials. Turf substitutions are a

tried and true method of effective water conservation and serves as the scientific basis for the project. The irrigation system will also be updated and the use of low water emitting irrigation systems and evapotranspiration (ET) controllers will be evaluated for potential use.

Laguna Niguel DRPP Project Site - Crown Valley Parkway Landscaped Median Improvements

Installation of an 18" wide mow strip along 5.4 miles to replace an existing landscaped median on Crown Valley Parkway is proposed. The irrigated area will be reduced by 2 acres, producing a water savings of up to 8 acre-feet per year. The southerly third of the median is served by domestic water, so an annual reduction of 2.6 acre feet of demand for imported water will result. The project will also reduce overspray onto roadway pavements, reducing nuisance runoff and extending the life of the pavement. The mow strip will be designed to drain inwardly rather than onto the street, so stormwater runoff, with its accompanying pollutant load of fertilizers, will also be reduced, which meets the goals of this proposal. The scientific basis for this project is derived from the fact that a mow strip generates no pollutants compared to a landscaped area. Fertilizer and pesticide application will be reduced due to the smaller grass area, so there will be less potential for discharge of nitrates, phosphorus, and toxics to the environment. Mowing operations will be reduced, resulting in less green waste, less noise pollution and less smog-producing energy usage. Safety for landscape workers will be improved because they will no longer need to work so close to oncoming traffic. Maintenance records will be utilized to demonstrate the reductions in water, pesticides, and fertilizer use.

Laguna Woods DRPP Project Site– Moulton Parkway Median Island Water Conservation Project

The Moulton Parkway Smartstreet is the major north-south arterial highway within the City of Laguna Woods. This project seeks to convert approximately 142,000 square feet of existing median turf grass to drought-tolerant tree and shrub plantings. The scientific basis for this project is derived from the proven methodology of drought tolerant vegetation. The science of water conservation associated with turf conversion is well documented and dependant on the plant selection, soil type and climate. Studies by EBMUD, Austin Texas, and North Marin County indicated water savings of between 42-54% associated with drought tolerant/ xeriscape conversions in residential applications. Specific estimates for the project site have not been calculated at this time. Ongoing water audits will be conducted of median landscape efficiency and quantification of reduction from previous supply levels in acre-feet per year.

The antiquated irrigation system will be upgraded with current water efficient technology, which includes designing for the future use of reclaimed water. The combination of turf conversion and irrigation upgrades will meet the goals of significantly reducing water consumption by minimizing high demand landscaping, improving the efficiency of necessary irrigation and minimizing overspray associated with conventional turf grass medians. Efficient irrigation reduces urban runoff. Planning and upgrading for the future use of reclaimed water will allow the City to further reduce its demand on potable water once a viable reclaimed water source is established.

Laguna Woods DRPP Project Site– El Toro Road Median Island Water Conservation Project

El Toro Road is the major east-west arterial highway within the City of Laguna Woods. This two-phase project seeks to convert approximately 30,000 square feet of existing median turf grass to drought-tolerant tree and shrub plantings. The antiquated irrigation system will be upgraded with current water efficient technology, which includes designing for the future use of reclaimed water. Phase One consists of the roadway median improvements from Moulton Parkway east to the City border at Paseo de Valencia. Phase Two consists of the roadway median improvements from Calle Sonora east to Moulton Parkway. The combination of turf conversion and irrigation upgrades is expected to significantly reduce water consumption by minimizing high demand landscaping, improving the efficiency of necessary irrigation and minimizing overspray associated with conventional turf grass medians. Planning and upgrading for the future use of reclaimed water will allow the City to meet the goals of further reducing its demand on potable water once a viable reclaimed water source is established. Ongoing water audits will be performed to determine landscape water use efficiency.

Mission Viejo DRPP Project Site – Marguerite Parkway Median Island & Slopes Water Conservation Project

Marguerite Parkway is the City of Mission Viejo’s principal north-south arterial highway. The highway has 4.87 acres of median islands planted exclusively in turf consuming approximately 19 AF per year. Additionally, many of the hillsides adjoining the highway lack mature landscaping leading to erosion problems during rainstorms, while a few areas have high water use slope coverings. The median conversion portion of the project is expected to save 15 AF per year of water by completely removing the existing turf grass in the median and installing a palette of drought-tolerant vegetation and ET controllers. Drought tolerant vegetation is a proven water conservation measure and serves as the scientific basis for this project. Irrigation runoff will be prevented through the placement of 18-inch wide pervious buffer strips next to the median curb so that “over splash” during irrigation does not occur. The project meets the goals of improving urban runoff quality by reducing the application of nutrient-rich fertilizers. Slopes adjoining the roadway will be planted in drought-tolerant vegetation designed to stop sediment from leaving the hillside and entering the highway’s catch basins and storm drain system during rainstorm events, while at the same time providing a water use savings over traditional high-water use landscaping that is found on some areas of the hillside.

Mission Viejo DRPP Project Site– Trabuco Road Median Island Water Conservation Project

Trabuco Road is a major City of Mission Viejo highway with 1.67 acres of median islands planted in turf consuming approximately 7 AF per year. The median conversion portion of the project is expected to save 4.5 AF per year of water by completely removing the existing turf grass in the median and installing a palette of drought-tolerant vegetation and ET controllers, which are proven methods and serve as the scientific basis for the project. Irrigation runoff will be prevented through the placement of 18-inch wide pervious buffer strips next to the median curb so that “over splash” during irrigation does not occur. The

project meets the goals of improving urban runoff quality by reducing the application of nutrient-rich fertilizers.

San Juan Capistrano DRPP Project Site– Marco Forester Middle School Soccer Field Synthetic Grass Installation Project

The Marco Forster Field Improvement Project will convert an existing under-utilized and deteriorating athletic field into a beautiful new state of the art synthetic sports field. The existing grass field is regularly irrigated three times per week in the evenings. The irrigation systems at this location are antiquated, and leaks occur on occasion. The City of San Juan Capistrano has no recycled water and only a small amount of non-potable water supplied from wells, therefore all the water used at this location is domestic water. As a synthetic field will require only a minimal amount of water for monthly cleaning, it is expected that a total average savings of 17.9 acre feet per year of domestic water could be saved. The project includes removal of the existing grass field and over-excavation of field to provide for 8” of gravel drainage sub-base and 3” synthetic turf carpet. Miradrain brand sub-drainage systems will be installed and connected an existing storm drain system via construction of storm drain laterals to the main line. Concrete curbs and area drains will be installed surrounding the field. The curb provides a border and attachment point for the synthetic turf. The turf in-fill shall be 100% recycled crumb rubber. Site amenities such as team benches, bleachers, trash containers and enclosure, soccer goals and permanent field boundary lines will complete the main improvements.

Significant environmental benefits can be expected to result from the proposed improvements. Synthetic fields require none of the herbicides, pesticides and fertilizers that natural grass fields need for proper maintenance. Even when properly applied and managed, some factor of the quantities used will make their way into nearby San Juan Creek via storm and urban runoff. The proximity of San Juan Creek to the project site means that materials will have an opportunity to percolate and be naturally filtered through the highly-permeable synthetic field before entering the stream. The elimination of the use of these constituents will lessen effects to the environment. Additionally, the elimination of mowing the turf areas will get rid of some measure of particulate air pollution from internal combustion lawn mowing equipment. Likewise, noise pollution this equipment produces will be eliminated. Tremendously reduced maintenance needs allows for recreational use 365 days a year by the neighboring secondary school as well as local residents and organized sport teams.

San Juan Capistrano DRPP Project Site – Native Planting Master Plan

The City of San Juan Capistrano has many acres of landscaped areas that are currently planted with decorative planting which are high in water consumption. These areas include parks, roadway sidings and medians, open space areas, and facilities landscaping. This project will take an inventory of planted areas in the City, and develop a Master Plan for converting these areas to low water use native plantings. The Master Plan will provide a for a yearly capital project devoted towards this conversion, and will outline a 12 to 15 year plan for these scheduled improvements that will bring these areas of the City into water conservation compliance. It is estimated that this renovation can reduce water consumption by over 50% and save a total of 92 acre feet of water per year. Applications of herbicides,

pesticides and fertilizers would be reduced, decreasing the potential for polluted runoff. Replacement of plantings also offers an opportunity to install swales and other BMPs to improve non-point source pollution uptake and control. This project will treat for urban runoff pollutants thereby reducing the effects that these would have on the quality of the source waters (San Juan and Trabuco Creeks) to the San Juan Basin groundwater aquifers. Furthermore, the replacement of non-native plantings with native ones will provide an example for the rest of the watershed area, creating a more favorable habitat for regional wildlife.

AQUATIC ECOSYSTEMS AND WATERSHED MANGEMENT PROJECTS

City of Aliso Viejo – Wood Canyon Emergent Wetland Project

The City of Aliso Viejo proposes to construct an emergent wetland at the headwaters of Wood Canyon Creek using a mosaic of native riparian and multiple vegetation strata that would enhance habitat-supported functions and values, improve water quality, and mitigate channel incision, degradation, and flooding. Wood Canyon Creek is a major tributary to Aliso Creek, which flows into the Pacific Ocean. Recreational and aesthetic benefits will result through bird watching, nature study, painting and photography, and other passive activities. In addition, educational and public outreach benefits will increase residents' understanding and appreciation of wetlands, including how human interaction impacts habitat areas and other natural resources. The project supports habitat restoration by providing permanent residency and breeding for wildlife seasonally and year round. An increase in vegetation diversity and structure would improve wildlife habitat by offering more resources for nesting, foraging, and cover. It also contributes to the City's natural scenic resources, strengthening the linkages between surrounding trails and parks.

The proposed project will consist of constructed wetlands, which will provide storm water capture, storage, treatment, and management, as well as removal of non-native plants, while enhancing wetlands. In addition, the wetland treatment incorporated in this project has been proven to dramatically reduce pathogenic indicator bacteria by 80-90%, as shown in similar wetland projects in a neighboring city, Laguna Niguel, which has achieved about 99% treatment efficiency in bacterial loading and about 6-7 degrees drop in temperature. The project will also excavate the bottom of an existing flood control basin, increasing its capacity. Thus, the project will accomplish non-point source pollution reduction, management and monitoring, and improve flood control.

City of Aliso Viejo – Canyon Vista Emergent Wetland Project

The City of Aliso Viejo is proposing to acquire right-of-ways to construct an emergent wetland using a mosaic of native riparian and multiple vegetation strata that would enhance habitat-support functions and values, improve water quality, and mitigate channel incision, degradation, and flooding. Recreational and aesthetic benefits will occur through bird watching, nature study, painting and photography, and other passive activities.

Educational and public outreach benefits will be realized and will increase residents' understanding and appreciation of wetlands, including how human interaction impacts habitat areas and other natural resources. Habitat restoration will result from the project by providing permanent residency and breeding for wildlife seasonally and year round. An increase in vegetation diversity and structure would improve wildlife habitat by offering more resources for nesting, foraging, and cover.

County of Orange, South Orange County Wastewater Authority and Moulton Niguel Water District - Aliso Creek Mainstem Ecosystem Restoration and Emergency Sewer Replacement

The County of Orange, South Orange County Wastewater Authority (SOCWA) and Moulton Niguel Water District (MNWD) propose to provide stream bank stabilization and ecosystem restoration of the Aliso Creek in the reach beginning at the AWMA Road park entrance and ending downstream at the South Orange County Wastewater Authority Treatment Plant bridge (Phase I).

The creek and utility infrastructure has been greatly impacted by urban development (increased flows) and heavy storms. Stream banks have eroded, and now SOCWA and MNWD utility lines have been compromised. SOCWA and MNWD are facing replacement and/or relocation of a sludge force main and sewer line as well as construction of a new recycled water line. In addition to the stream bank stabilization and ecosystem restoration, hiking/biking trails will be added, as identified in the Aliso Creek Watershed Management Plan.

The project proposes a multi-objective approach to Aliso Creek watershed development and enhancement, accommodating channel stabilization, flood hazard reduction, economic uses, aesthetic and recreational opportunities, and habitat concerns.

South Orange County Integrated Regional Water Management Group– Arundo Removal

The South Orange County Integrated Regional Water Management Group (IRWMG) proposes a region-wide program to remove non-native *Arundo donax* from creeks located within the San Juan Hydrologic Unit. The IRWMG is currently preparing a region wide removal Plan, which will prioritize where to begin the removal, the proper methods, and future O&M efforts.

In the San Juan Hydrologic Unit, many creeks are infested with *Arundo donax*, which have out competed the native species that once provided shade and cooler water temperature for steelhead trout. By removing the non natives, and allowing for the natives to return, augmented by willow and other native plantings, our creeks can return to a healthier state and support the steelhead trout that once inhabited these creeks. The need for non-native plant eradication is recommended in the Aliso Creek Watershed Management Plan, the San Juan Creek Watershed Management Plan, and the Invasive Species Control Plan for Rancho Mission Viejo.

City of Laguna Beach – Bluebird Canyon Creek Restoration Project

The Bluebird Creek Improvement Project proposes to study and develop multi-beneficial improvement plans for the creek and infrastructure in the immediate area. In addition, completion of the necessary CEQA and environmental documentation will contribute to the knowledge of the wildlife and natural environment of the area. The proposed project will include 1) restoration of the creek habitat; 2) storm drain improvements; 3) elimination of a sewage lift station and installation of a gravity sewage line; 3) creation of a walking pathway

and utility right-of-way easement and 4) Public outreach and education on pollution prevention and watershed management.

City of Laguna Beach and Laguna Beach County Water District – Laguna Canyon Creek Restoration Project

The project is being pursued by the City of Laguna Beach in partnership with the Laguna Beach County Water District. An initial study and completed by the City has determined that the creek is now functioning at about 50 percent of its overall habitat, biological, and hydrologic functional capacity. A study included development a conceptual plan of multi-beneficial restoration opportunities for the creek.

The proposed project will complete the detailed planning, environmental documents and construction to restore about 5,500 lineal feet of the creek. The project includes the restoration of 8 existing acres of riparian habitat. It is estimated that the proposed restoration will expand the existing riparian and wetland habitat by two to four acres. The study and conceptual restoration plan identified the following opportunities to improve the creek habitat and general stream functionality:

- Reconfiguration of the creek to meander rather than be linear in nature.
- Expansion of the creek to create a creek low-flow channel, terrace and floodplain.
- Removing non-native species and replanting with native plant and trees.
- Daylighting tributary drainage pipes that flow to the creek.
- Incorporation of wildlife crossings at key locations.
- Incorporation of a recreational trail loop to link adjacent wilderness park areas.
- Identifying natural drainage locations to create wetland capture areas for groundwater infiltration and recharge.
- Identifying areas for groundwater recovery to augment and/or reduce the need for imported water.
- Community participation to promote and improve watershed management of the Laguna Canyon.
- Pollution prevention education and outreach to address land use activities that may produce nuisance water runoff.
- Stream bank and slope stabilization utilizing native trees and vegetation and floodwalls made of native rocks and boulders
- Pre and post project ecological monitoring of the creek wildlife and vegetation.

As demonstrated above, the project will ultimately greatly enhance the riparian and wetland habitat.

City of Mission Viejo – English Creek Aquatic Restoration Study and Construction Project

The proposed Aquatic Restoration Study for English Creek will seek to identify alternatives to re-establish a stable, healthy, and sustainable watershed environment through the use of structural and non-structural approaches. During the past several years, the City has experienced increasing problems with erosion occurring at various drop structures and loss of habitat along English Creek. In May 1999, the U.S. Army Corps of Engineers, Los Angeles

District, completed a Draft Feasibility Report titled Aliso Creek Watershed Management Study—Orange County, California (Study), which includes English Creek (a tributary to Aliso Creek). The Study identified several management measures to improve and restore emergent wetland and riparian habitat, construct wetlands, and install bank protection and re-establish a stable invert condition along English Creek to avoid channel erosion, deposition of eroded materials downstream, and creation of stagnant water conditions. English Creek is a City-owned and -operated drainage course, which is in a natural condition. Surface and ocean water quality are directly affected by inorganic, organic, and floatable contaminants, which discharge to Aliso Creek and eventually to the Pacific Ocean from facilities such as this channel. Completion of this rehabilitation project could enhance water quality downstream. After suitable alternatives for restoration have been identified by the study, final design of preferred alternatives will be completed.

The project will first produce a detailed project report from which plans to restore English Creek can be derived. Subsequent actions will be performed to reduce erosion and enhance wetland and riparian habitats. In addition, the project aims to enhance water quality downstream in the English Creek that drains into the ocean. The riparian and aquatic habitats created as a part of the project construction will improve water quality by filtering sediments and bacteria before they reach Aliso Creek. Stormwater management will also be accounted for through various erosion control measures. The removal of non-native species will also prevent the spread of non-native species that threaten to continue to alter stream morphology by retaining sediments and constricting flows. Other benefits include reduced risks to public health.

Starr Ranch Sanctuary – Bell Canyon Riparian Enhancement Project

Starr Ranch Sanctuary is a 4,000 acre Audubon preserve located in southeastern Orange County. The property is centered on Bell Canyon Creek, a tributary of San Juan Creek, which flows to the Pacific Ocean. Starr Ranch proposes a riparian enhancement project that focuses on the removal of exotic plant species (particularly *Vinca major*) along the riparian corridor of Bell Canyon within Starr Ranch, followed by enhancement of the native vegetation. This project will employ a non-chemical approach to weed removal and restoration.

While Bell Canyon is one of only a handful of pristine streams remaining in Orange County, the presence of non-native plant species is negatively impacting the riparian corridor. Non-natives are steadily replacing native plant species, and several sections of Bell Canyon are currently vegetated exclusively by *V. major*. The riparian areas of Starr Ranch, combined with those on the adjacent wildlands of the Cleveland National Forest and Caspers Wilderness Park, serve as important habitat for many species of aquatic and terrestrial wildlife. The proposed project will enhance riparian wildlife habitat along Bell Canyon, and significantly decrease the spread of exotic plant species, particularly *V. major*, downstream in Bell Canyon, as well as within San Juan Creek.

Non-Governmental Organizations (NGO) – Habitat Restoration Projects

The IRWM Group will implement Non-Government Organization (NGO) projects by utilizing the Wetlands Recovery Project (WRP) South Orange County Small Grants Workplan funding. WRP is a unique alliance of federal, state and local officials using a non-regulatory approach and an ecosystem perspective, to establish and implement wetland acquisition and restoration plans. By coordinating efforts and effectively targeting resources, the WRP is turning what would otherwise be piecemeal efforts into a visionary and long-term regional approach.

The WRP Small Grants Program provides funding for community-based restoration projects in coastal wetlands and watersheds in the region. The purpose of the program is to build local capacity to plan and implement wetland restoration projects; promote community involvement in wetlands restoration activities; and foster education about wetlands ecosystems. Each January the WRP solicits proposals for the Small Grants Program and Nonprofit organizations and local agencies are eligible to apply. Proposals are reviewed by a committee that includes a representative from each of the five county task forces. Typically projects are selected and can begin receiving funds by early summer. IRWM Group is currently working with the local Task Force and the California Coastal Conservancy to decide how we can work together to fund additional projects in South Orange County.

Examples of projects funded by the WRP include the Laguna Beach Restoration and Outreach Project (total project cost \$66,000). Organized restoration/education events will take place to remove non-native species within the project area and replant with native plants and shrubs. The project will promote community involvement and participation in restoring a reach of Laguna Creek. The project will foster education about wetland ecosystems and watershed management, which will build community capacity to complete additional restoration projects along the creek.

WATER QUALITY/POLLUTION REDUCTION PROJECTS

City of Laguna Beach – Heisler Park Marine Habitat Protection Project

The City's Heisler Park needs to be renovated to protect the adjacent Heisler Park Ecological Reserve, which is a State designated area of special biological significance, and to help preserve the park. This project will help the City comply with a State Water Resources Control Board mandate prohibiting discharges to the ecological reserve.

The ecological reserve and park are both regionally and locally significant. This area is a main attraction for the more than 3 million people who visit the City each year for the natural beauty and recreation opportunities. The proposed project is to complete construction of the following park improvements: a controlled and efficient irrigation system, landscape grading, surface and storm drain improvements, bathroom replacements, and coastal bluff stabilization. The project goal is to achieve the following benefits:

- Water Conservation through a controlled and efficient irrigation system design
- Maximize the infiltration of runoff in landscape areas
- Diversion of non-storm runoff to the sewer system
- Filtering of storm water flows to remove gross pollutants
- Eliminate the potential for sewage spills
- Reduce excess erosion of the coastal bluff area
- Treatment of diverted runoff at the wastewater facility
- Improved public safety through shoreline stabilization

Overall, the project will preserve the park for recreational uses, as well as flood mitigation and groundwater protection objectives. The project will also facilitate a better understanding of watershed planning through the project design effort and public outreach.

San Clemente – Segunda Deschesha Urban Runoff Project

The project consists of installing an ultra violet treatment system adjacent to the Segunda Deshecha Flood Control Channel to improve the water quality of urban runoff at one of the most popular beaches in San Clemente with over 600,000 annual visitors. The project will consist of modifications to a diversion installed by the County of Orange, a wet well, pump, treatment facility and discharge pipe to either the land outfall pipeline or a pipeline extended in the box channel to outlet past the channel to minimize ponding.

The project will remove bacteria from urban runoff and will be diverted to the land outfall or will be rerouted to reduce ponding which creates poor water quality at the discharge to the ocean. Currently the beach is posted with closures and warnings throughout the year due to high levels of bacterial indicators. This project will improve the condition of the discharge and provide better water quality for recreational activities at the beach.

The project will specifically address water quality improvements and stormwater treatment, potentially enhancing ocean ecosystems as a result. In addition, the treated water will be potentially utilized as a landscape irrigation supply. This is particularly important to the area

due to the high volume of recreational visitors to the beach where the channel empties. This project is also an opportunity to expand available regional data for technological processes.

San Clemente – San Clemente Watershed Pollutant Source Investigation

San Clemente is an ideal representative watershed in coastal Southern California for the purpose of researching pollutant sources and controls. Unlike any other coastal watershed in Southern California, San Clemente Watershed boundaries roughly match jurisdictional boundaries, and the upstream tributaries to local creeks and canyons are virtually untouched by human activities. San Clemente has a variety of localized land use types, including open space, residential, commercial/industrial, etc., with unique features such as a regional landfill. San Clemente also has varying degrees of environmental health, ranging from routine/permanent postings at Poche Beach and North Beach and 303(d) listed impaired water bodies, as well as virtually pristine coastal waters at Trestles. The primary intent of this project would be to identify the likely sources of pollutants (including, at minimum, bacterial indicators, trash, debris, nutrients, turbidity) and identifying possible pilot projects to improve water quality at the various impacted beach locations. Suggested studies include, but are not limited to, identification of pollutants anticipated by land use, the prevalence and impact of groundwater intrusion, bacterial regrowth in the storm drain system and in scour ponds, the impacts of greenwaste on bacterial growth, and the sources of pollutants – including DNA typing. Results from such research would contribute significant information applicable to innumerable watersheds. The source investigation may also initiate new stormwater treatment and management programs and will identify prospective methods to reduce non-point source pollution. As a watershed-wide study, which includes areas of varying degrees of health, the project presents an opportunity to improve watershed management and planning as a regional whole.

San Juan Capistrano – San Juan Basin Well Inventory and Abandonment

The project includes locating and inventorying inactive agricultural wells, as identified in the San Juan Basin Groundwater Management and Facility Plan, for the purposes of properly deconstructing and abandoning the wells. The wells were not properly abandoned in accordance with California State laws and regulations and as a result, the wells may pose a significant threat to human health and the shallow alluvial aquifers that the wells penetrate in the San Juan Groundwater Basin.

The project uniquely incorporates issues related to water supply and water quality protection, as well as the proper and legal abandonment of inactive wells. It addresses groundwater management by protecting the San Juan Basin's groundwater supply from surface pollution, and the intermixing of water between aquifers of different water quality. The project will further prevent contamination by properly deconstructing inactive wells that have the potential to pollute groundwater sources. The 128 inactive agricultural wells pose a serious threat to surface water pollution and groundwater pollution. The wells may also facilitate intermixing of water between aquifers of different water quality, provide a breeding ground for mosquitoes and other disease spreading vectors, and pose a dangerous threat to animal life and humans who may fall into the open or collapsed casing. Proper deconstruction and abandonment of the wells will eliminate and significantly reduce pollution into San Juan

Creek and Arroyo Trabuco Creek waters, San Juan Basin groundwater, and existing wildlife habitats surrounding the open well casings.

The purpose for this project is to improve groundwater quality and expand overall basin management practices. Furthermore, by protecting the local groundwater supply, the region can increase its use of the resource and reduce its dependence on imported water.

San Juan Basin Authority – Environmental Monitoring

The San Juan Basin Integrated Monitoring Program includes regular monitoring of the hydrologic and biologic characteristics of the San Juan Basin, which could potentially be affected by the implementation of Phase I of the San Juan Basin Groundwater Management and Facility Plan. Biologists and hydrologists jointly selected monitoring well locations and vegetation monitoring sites representative of native riparian plant communities along portions of San Juan and Trabuco Creeks where there is hydrologic connectivity between the surface and the groundwater flow regimes (i.e., the groundwater table and surface water flow intercept). Depth to groundwater, streamflow, water quality, meteorology, and groundwater pumping data have been collected at each of these study sites and correlated with the health and vigor of riparian growth as determined by measurement of plant water potential. The monitoring program has been underway for one year. Water quality samples will continue to be obtained biannually from each of the monitoring wells in the program for subsequent analytical laboratory work for general physical and mineral constituents. Once a sufficient number of these sampling rounds have been conducted, the results will be statistically compared to historic concentrations from the basin to evaluate any changes that could potentially result from groundwater extractions.

The South Orange County Plan calls for enhancing local water supply and system reliability. These management tools include development of local groundwater sources, recycled water sources, water conservation, stormwater capture, water quality and development of desalination facilities. The data collected as part of the continuing Integrated Monitoring Program will greatly enhance many management decisions and future planning efforts within the San Juan Basin, which in turn protects the local water supply reducing dependence on imported water.

Dana Point – Doheny State Park Beach/San Juan Creek Investigation and Implementation Project

Doheny State Park Beach, at the mouth of San Juan Creek was posted for uncertain water quality for 358 days of 365 in 2003 in accordance with AB 411 monitoring results. Doheny State Park Beach has also been identified as a Critical Coastal Area (CCA). The State of California Clean Beach Task Force has identified Doheny State Park Beach as the number one priority for the State of California, based on its high number of postings and its large number of visitors. The coastline at the mouth of the San Juan Creek is designated as an impaired water body for bacteria.

There is no definitive information on the source of the identified bacteriological contamination, nor the seriousness of potential impacts to human health from immersion in water at this beach. Some of the issues to be investigated include: the effects of birds and

other wildlife that gather at the mouth of the San Juan Creek, the San Juan Creek Ocean Outfall which discharges some 20 mgd of secondary treated effluent 1.9 miles offshore, the old Dana Point Outfall and any other pipelines which discharge in the vicinity, boats which enter Dana Point harbor which may discharge sewage illegally, the configuration of the harbor itself, the stagnation of water in the harbor, plus trash, dumping, and faulty sewage pump equipment. Additionally, urban runoff, contamination of sediments and their disturbance during storms, private and public restrooms and septic systems, and changes in tides and temperatures would each be investigated.

Further, the San Diego Regional Water Quality Control Board has begun meetings to develop a TMDL to reduce or eliminate urban runoff contaminated by bacteria. In order to develop appropriate solutions to better protect human health and potentially reduce or eliminate the frequency of beach postings, the City hopes first to understand the causes and investigate better indicators. These studies need to be done to help better understand where diversion projects may be appropriate.

The City of Dana Point, along with other stakeholders proposes to facilitate an Epidemiological Study concurrently with a Microbial Source Tracking Investigation. These studies are intended to identify the source and types of microbial contamination and correlate if there are any current impacts to human health from exposure to the ocean at Doheny State Park Beach, at the mouth of San Juan Creek. This builds upon the similar pilot studies that have been done for Mission Bay in San Diego.

The purpose of the Microbial Source Tracking Investigation is to identify the sources of the high bacteria counts, both in terms of physical location and source animal. It determines the extent of human versus natural (bird/animal) contributions to the current bacteriological counts and where they are coming from, e.g. San Juan Creek, beach walking birds, seaweed, tidal sand re-growth, etc.

The purpose of the Epidemiological Study is to determine the extent, if any, of possible adverse human health outcomes from water immersion at the beach. First, it will confirm or dispute whether individuals are becoming ill and to what extent by using the ocean. Second, if illness is identified, it will correlate whether current testing adequately predicts that illness. Included in this study is a comparison of less expensive, more valid and quicker testing methods to include virus, coliphage and rapid QPCR. This may help reduce testing periods from 24 to 2 hours and identify improved human illness related testing protocols.

After completion of the investigation, which will help define the sources and risk of the water quality impairments, it is expected that several recommendations for management measures will be developed to address the identified problem(s) improving water quality and restoring beneficial uses. A strategy for implementation of appropriate management measures will be developed. Because, at this time it is not known what the source or sources are of the water quality impairments are (speculations include: birds and wildlife, impacts of the Harbor including boats and circulation issues, impacts of the sand berm, upstream flows and urban runoff among others), it is unknown which management measures will be effective. In addition, it is not clear whether or not the bacterial impairments found at Doheny State Park

Beach pose a risk to human health. Therefore, the results of the investigation are imperative in order to design and implement appropriate management measure strategies. Some of the management measures that may be evaluated and considered include: bird management, Harbor management and/or improvements, beach operation and management, capital improvement projects, enhanced monitoring, enforcement, nuisance water diversions and other identified Best Management Practices. This investigation and approach may be applicable to and benefit other regions as well.

The project is expected to have significant implications for watershed management, reduction of non-point source pollution, and improved water quality.

South Orange County Integrated Regional Water Management Plan Group – Cleaning Urban Runoff Effectively (CURE) Regional Action Project

The CURE Regional Action Project is a multi-faceted project that addresses surface water quality constituents of concern such as bacteria, toxicity, phosphorus, and trash by reducing the quantity of pollutants entering the storm drain system through the construction and implementation of various structural BMPs as determined by the participating cities in the program.

Over the course of time, the CURE Regional Action Project will seek to provide an allotment of funding to all participating cities in the region for the following types of BMP installations:

1. Constructed Wetlands at storm drain outfalls, designed to reduce bacteria, toxicity, and trash in creek flows;
2. Storm drain diversions to the sanitary sewer system to keep bacteria and other pollutants contained in dry-weather storm drain flows from reaching creeks and beaches;
3. Grease interceptors at restaurants and other food facilities to prevent sewer backups, which in turn prevents bacteria-laden grease from entering storm drain pipelines;
4. Trash/debris gates on drainage inlets to keep trash on the streets (available to sweepers) during low-flow and moderate-flow runoff conditions;
5. In-line or end-of-pipe trash and debris collection devices to capture trash that bypasses the inlet debris gates during high-flow storm conditions;
6. Hydro-dynamic separators in storm drain pipelines to remove trash and large debris from low and high water flows;
7. Catch basin filters to prevent oils and metals from entering storm drain pipelines during low flow conditions; and
8. Other BMPs that are identified or will become available that help to reduce bacteria, toxicity, and other pollutants of concern from entering the storm drain system.

Each participating city will define its key project sites and priorities, with funding allocated as it becomes available based on eligibility criteria agreed among the participants.

Justification for CURE projects that address bacteria, toxicity, turbidity, and phosphorus:
Several creeks and beaches within the region such as portions of Aliso Creek, San Juan

Creek, Prima Deshecha Creek, and Segunda Deshecha Creek, and the Pacific Ocean shoreline, Heisler Park, Dana Point Harbor have been 303(d) listed for beneficial use impairments due to bacteria, toxicity, turbidity, and phosphorus. CURE projects that address these impairments are considered an important component of TMDL implementation.

Justification for CURE projects that address trash and debris: The San Diego Basin Water Quality Control Plan specifies that “waters shall not contain floating materials”, and describes them as an aesthetic nuisance as well a substrate for algae and insect vectors. Investigations preliminary to 303(d) listing have begun for the region’s beaches or creeks and a formal “impairment” may be declared in the near future. It follows that, the CURE projects that primarily address trash containment are assured to become an important component of TMDL implementation.

Control and removal of trash and debris (also known as gross pollutants) from nuisance and storm flows is a necessary first stage in iterative treatment to improve the performance and reduce maintenance requirements of second-stage BMPs for particulate pollutants and of third-stage BMPs for dissolved or micro-organic pollutants in surface waters. Removal of trash will directly reduce impact on aquatic macro-organisms in receiving waters, who may otherwise become entangled or whose food intake may be affected. Removal of trash will also improve aesthetics for recreational use of surface waters. Trash removal also provides an extraordinary visual opportunity for public education, because images and quantifications of the removed material can be utilized effectively in public education campaigns. To the extent feasible, removed materials will be routed to materials recycling facilities to conserve resources and reduce landfill capacity impacts. Widespread implementation of trash and debris-related CURE project sites will significantly reduce trash and debris pollution by removing it from both low-flow and storm flows. Each city will take advantage of the Orange County Stormwater Program’s September 2003 report, “Trash and Debris Best Management Practice Evaluation”, in selecting appropriate site-specific approaches.

Proposed Public Sector CURE Projects

The following is a partial list of tentative public sector projects that may be implemented under the CURE Regional Action Project. Other projects may be added at the option of the participating cities, water districts, or the County of Orange. Current participants and contributors are the cities of Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Mission Viejo, Rancho Santa Margarita, San Juan Capistrano, Aliso Viejo, Lake Forest, San Clemente, and the County of Orange,

All Cities and County - Trash and Debris Catch Basins

The cities and unincorporated County areas of the Region plan to install trash and debris gates on catch basins and other drainage inlets to keep trash out of the storm drain system. Trash and debris gates on catch basins serve multiple purposes. The gates prevent trash from entering the storm drain system during dry weather; and during heavy storms, the gates open to allow rain flows to pass through without causing localized flooding. During dry weather, accumulated trash and debris may then be swept up by routine street sweeping, rather than

requiring additional maintenance operations. Preventing trash from entering the storm drains reduces the impacts it has on freshwater and marine aquatic environments, where it damages wildlife and threatens human health and safety. The gates also prevent leafy debris and some sediment from entering the storm drains, where they may contribute to clogged flow pathways. Reduction of leafy or fecal organic debris in pipe systems as well as receiving waters may also reduce the magnitude of fecal bacterial propagation in the environment. Several of the watersheds and beaches within the region are listed as impaired for fecal indicator bacteria, which are linked to impairment of beneficial use of surface waters for recreation purposes.

The project proposes to fund the construction of approximately 950 trash and debris gates Region-wide. Thus, the gates are expected to have a significant impact on the amount of trash that is discharged into creeks and ocean environments, where accumulations of trash render the sites unsafe and unattractive. The project will improve ecosystem health and contribute to overall watershed management in the Region by targeting non-point-source pollution, consistent with statewide management measures.

Aliso Viejo – Dairy Fork Trash Removal and Wetland Treatment

Dairy Fork is a small tributary to Aliso Creek, a coastal stream in southern Orange County with a watershed area of 35 square miles. Presently, Aliso Creek is listed as a Category 1 (Impaired) Priority Watershed in the California Unified Watershed Assessment List. The primary cause of impairment is non-point source pollution. Dairy Fork in particular has exhibited elevated fecal coliform concentrations (log mean => 34,000 Most Probable Number (MPN) /100 ml) and high temperatures (mean = 20 Degrees Centigrade), and may be a significant contributor of bacteria to Aliso Creek. The City of Aliso Viejo is proposing to construct an emergent wetland using a mosaic of native riparian and multiple vegetation strata that would improve water quality (nutrient, toxicity, and bacteria levels). Through a continuous deflective separation system and the wetland treatment system, water quality will improve. In addition, a catch basin insert device will be installed to control trash and debris. The project will also enhance habitat-support functions and values and mitigate channel incision, degradation, and flooding. An increase in vegetation diversity and structure would improve wildlife habitat by offering more resources for nesting and foraging. Recreational and aesthetic benefits of bird-watching, nature study, painting and photography opportunities will be improved. Regular maintenance of the wetlands and the continuous deflective separation system will be performed to ensure healthy vegetation, vector control, and trash removal.

Aliso Viejo – Storm Drain Bacterial Mitigation Project

The City of Aliso Viejo is proposing to install Anti-Microbial Filters (Trench Filters®) in four storm drain systems with the highest levels of bacteria (fecal coliform, total coliform, and enterococcus) based upon the County of Orange's storm-water sampling data. This will improve water quality by mitigating bacterial loading, which flows into Aliso Creek, an impaired water body. The Trench Filters are designed and developed by Attitude Technology, which are made of X-tex material and are designed to be deployed in storm drainpipes. Trench Filters are coated with an anti-microbial finish that has been around for some time and has proven very effective in other industries. The filters kill bacteria by

physical molecular electrocution while not diminishing the anti-microbial properties by repeated bacterial contact. The filters are also designed to remove sediment, oil and grease from storm-water in-situ using passive filtration in stormwater pipes or trenches in addition inhibiting the growth of fungus and algae. The project will result in improvement of water quality and enhancement of beneficial uses for Aliso Creek by reducing or eliminating indicator bacteria. This will allow the creek waters to meet REC 1 standards for beneficial uses of local waterways and aid habitat restoration of Aliso Creek.

Dana Point – Catch Basin Filter Retrofits

The City of Dana Point plans to upgrade approximately 150 catch basin inlet filters with DrainPac drop inlet filters with stainless steel gages, providing better durability and longer life cycle. Previous retrofit installations of inlet filters have demonstrated removal of pollutants, including trash, debris, sediment, petroleum hydrocarbons, and heavy metals. The City also proposes a pilot project consisting of the installation of three self-opening catch basin debris screens. Previous installations of debris screens have resulted in flooding due to leaves causing a blockage of the catch basin inlet. It is the intent of the new improved catch basin debris screens to open and allow flow during periods of heavy rains, preventing flooding, while screening trash during dry and low flows, so that the trash and debris is prevented from entering the municipal storm drain system by being picked up during regular street sweeping. Eliminating silt, trash and other debris from the runoff prior to discharging to the receiving waters may contribute to the improvement of water quality and the protection and improvement of environmental habitat at the receiving waters. Specifically, this project will positively impact the San Juan Creek, Dana Point Coastal Streams and San Clemente Coastal Streams watersheds which drain to the Pacific Ocean, improving to watershed management and coastal recreation opportunities.

Dana Point – Dana Point Harbor and San Juan Creek Nuisance Water Diversions

The City conducted a master plan to identify potential sites for nuisance water diversion based on specific criteria. Potential diversion sites were then prioritized based on anticipated water quality benefits and impairments of the receiving waters. As the City conducts its microbial source tracking and epidemiology study and continues to implement source control strategies, the need for diversions may decrease; however due to previous experience, the City acknowledges that nuisance water diversion systems can be an effective BMP.

The proposed project includes final design and construction of a total of eight diversions within the Dana Point Harbor and the San Juan Creek Watershed within the City of Dana Point. Implemented, this project will provide a comprehensive nuisance water diversion system in San Juan Creek, eliminating all significant sources of nuisance water to San Juan Creek, Doheny Beach and the Pacific Ocean. The project will also enhance water supply reliability as the diverted water is to be directed to the proposed SOCWA recycled water treatment plant. This project is proposed due to the success of previous diversion projects within the watershed and demonstrates a cooperative effort and effective short and long-term planning. The improvements include diversion of nuisance water flows to the sanitary sewer system, with pretreatment via separator units to remove gross pollutants. Two of the eight diversions are located in the Harbor; the other diversion systems are located at prioritized locations along San Juan Creek and the Coast. The project will result in improved water

quality and recreational uses. Since Doheny Beach serves as a central recreational location for many South Orange County residents, as well as visitors, the project will greatly reduce the frequency of beach closures and hazardous levels of water pollution in the waters surrounding the Dana Point Harbor and increase the safety of beach visitors.

Laguna Beach – Urban Runoff Diversion and Storm Water Filtering Systems at Five Beach Priority Storm Drain Outlet Locations

The proposed project includes developing design plans and construction of five (5) storm drain outlet locations along the coastline for year-round control of urban runoff and storm flows. The improvements will include diversion of urban runoff non-storm flows to the sewer system and separator units to remove gross pollutants from storm water. The project locations are 1) upgrade to the seasonal diversion at Bluebird Canyon; 2) upgrade to the seasonal diversion at Laguna Avenue / S. Main Beach; 3) a new system at Gaviota Street; 4) a new system at Mountain Avenue; and 5) a new system at West Street. The project will result in improved water quality for the urban runoff and storm flows, as well as habitat improvement in the Bluebird Canyon and the Pacific Ocean, increasing recreational opportunities and protecting public health. The project is consistent with the San Diego Region California Management Measures for Polluted Runoff Report, addressing the negative impacts on coastal resources. Monitoring will be performed to gather data on the quality of the runoff.

Laguna Beach - Catch Basin Filter Installations

This project proposes to install 20 catch basin grates and filters at priority coastal storm drain inlets in the City of Laguna Beach to reduce non-point source pollution. Each proposed unit is prefabricated to function as both a catch basin grate and filter in a coordinated manner, and is designed to filter low flow and first flush events when pollutant levels are typically the highest. The 20 locations will be areas where the most trash, debris and hydrocarbons can be removed from the stormwater runoff, maximizing the benefits. The project will provide ocean water quality environmental benefits by removing these pollutants. This will provide ocean habitat protection and decrease the risks to human and wildlife health in the coastal marine environment, listed as a State Marine Protected Area. Education and outreach will improve understanding of watershed management as it relates to stormwater, and a runoff monitoring program consistent with State surface water monitoring criteria will also be implemented.

Lake Forest – Catch Basin Filter Installation

This project proposes the installation of a vault-based hydrodynamic separator and 30 catch basin grates and media filters, including a maintenance program, in the J01P08 drainage area located near El Toro Road and Glenn Ranch Road. An additional 300 filters will be installed throughout the watershed in the City. Water that carries pollutants will go through an inlet screen that will trap large floatables, then through a media filter to remove dissolved and micro-organic pollutants, then to a separator, where additional floatables will be removed. The devices will reduce pollution by removing trash and debris, dissolved pollutants, and microorganisms, improving the water quality of Aliso Creek and assist in achieving a

beneficial use of REC-1. In addition to reducing these runoff pollutants from the water, there will be improvement to the appearance of the receiving waters.

Mission Viejo – Stormwater Vault at J01P03

The City of Mission Viejo will install an underground stormwater treatment vault with a system treatment capacity of 1.0 cubic feet per second to treat non-point source dry-weather low flow levels, and any runoff potentially containing oils from upstream high priority auto repair shops. The unit will be located off of an 81-inch City storm drain facility just upstream from a major discharge point into Aliso Creek. Control and removal of trash, sediment, oil, and debris from nuisance and storm flows reduces impact on aquatic organisms in receiving waters, and improves aesthetics and health safety for recreational use of surface waters. The device will be regularly monitored, and debris will be collected from the vault and assessed to provide characterizations of the material.

Rancho Santa Margarita – Avenida Empressa Stormwater Vault

The City of Rancho Santa Margarita will install an underground stormwater treatment vault with a system treatment capacity of 6,158 AFY to treat wet weather “first flush” flows, non-point source dry-weather low flow levels, and any runoff potentially containing Chromium from an upstream high priority industrial facility. The treatment vault can remove approximately 55% of chromium based on testing conducted for the unit. The unit will be located off of a 36-inch City storm drain facility just upstream from a major discharge point into Tijeras Creek in the San Juan Creek Watershed. Control and removal of trash, sediment, oil and debris from nuisance and storm flows reduces impact on aquatic organisms in receiving waters, and improves aesthetics for recreational use of surface waters.

Rancho Santa Margarita – Two (2) Additional In Line Treatment Systems – Trabuco Creek

The City of Rancho Santa Margarita will install two additional underground storm water treatment vaults with a system treatment capacity of 6,158 AFY or greater (final capacity to be identified at final design) to treat wet weather "first flush" flows and non-point source dry-weather low flow levels. The treatment vault removes a high level of urban pollutants typically associated with residences and streets based on independent testing conducted for the units. One unit will be located off of a branch storm drain that connects to the main 72- - inch City storm drain facility just upstream from a major discharge point into Trabuco Creek in the San Juan Creek Watershed. The unit would address NPS pollutants from the northern part of the City off of Santa Margarita Parkway. The second unit would be installed off of a branch storm drain that connects to the City’s 72-inch storm drain system located along Avenida de Las Flores just east of SR 241. The unit will treat typical urban pollutants from residential and commercial areas. Control and removal of trash, sediment, oil and debris from nuisance and storm flows reduces impact on aquatic organisms in receiving waters, and improves aesthetics and health safety for recreational use of surface waters.

Rancho Santa Margarita – Focused Trash and Debris

The City of Rancho Santa Margarita will install selectively City-wide “No Parking During Street Sweeping” signs to increase removal rates of sediment, debris, and trash during the

street sweeping program. The street sweeping program has a measurable decrease in debris and sediment entering the storm drain system by picking these pollutants up on a bi-weekly basis. Increasing access of the street sweeper will increase the removal of debris with this program. The City will also selectively install end of drain pipe trash and debris devices in areas where trash and debris are identified to bypass the inlet debris grates during storm flow events. Capturing trash and debris during moderate run-off conditions will result in a measurable reduction in down stream trash and debris from entering the storm drain system. The City will also implement a City-wide program within private HOA areas that connect to the City's storm drain system. The City of Rancho Santa Margarita is approximately 95% HOA areas. The City has implemented a requirement that all Major HOAs submit an annual NPDES report to the City. During the process it was identified that the HOAs did not have or very few had stencils on their private storm drain inlets. The implementation of this program will provide direct reduction to the number of incidences of residents in HOAs dumping debris into the storm drain systems. Control and removal of trash, sediment, and debris from nuisance and storm flows reduces impact on aquatic organisms in receiving waters, and improves aesthetics for recreational use of surface waters.

San Juan Capistrano – Catch Basin Debris Grate and Filter Project

This project proposes to install 100 catch basin grates and filters at various locations in the City of San Juan Capistrano. Each proposed unit is prefabricated to function as both a catch basin grate and filter in a coordinated manner, and is designed to filter low flow and first flush events. The hydrocarbon filter baskets can be easily accessed, allowing regular cleaning and analysis of contents to determine the amount of contaminate uptake that is occurring. The locations chosen for installation are the most critical locations, near heavy trafficked areas and commercial districts. Significant environmental benefits can be expected to result from the proposed improvements. Removal of urban contaminants including pesticides, herbicides, oils, trash, heavy metals, hydrocarbons, pet waste, decomposing leaves and grass, and fertilizers from the San Juan Creek Watershed stream flow will result in positive effects on the riparian habitat. The project also serves to protect local water supply resources by removing contaminants prior to entering the creeks which serve as the concentration and recharge points for the local groundwater basin.

San Juan Capistrano – Trabuco Creek Equestrian Waste Mitigation and San Juan Creek Equestrian Waste Mitigation

The two neighboring projects will restore and protect water quality, and improve beneficial uses of surface waters, coastal waters and near shore waters through control of nonpoint source pollution on (1) Trabuco Creek and (2) San Juan Creek. Trabuco Creek is tributary to San Juan Creek, which is on the California 303(d) list for elevated coliform levels. Recent water quality testing indicated high coliform counts at multiple locations in the Trabuco and San Juan Creeks. Other constituents of concern include nutrients and sediment, all of which are typically generated by stable-area runoff.

The project involves establishing various BMPs at twelve public equestrian facilities located along San Juan Creek and Trabuco creek to reduce both non-storm water runoff and untreated stable area "first flush" discharges to the Creek, thereby reducing stable-generated contaminants into the Creeks. Major sources of equestrian facility pollution are open, unbermed manure storage areas and horse wash racks. For this reason, the minimum

recommended BMP construction will likely include covering manure storage areas and routing dry weather flows to the sanitary sewer. The ultimate BMP recommendation(s) for each facility will be based on the findings of the site investigation.

BMPs considered will include but are not limited to facility retrofitting, improved waste management practices, and outreach and education. Proposed facility retrofits include covered manure containment, covered horse wash racks with drains routed to the sanitary sewer, greater use of permeable surfaces, berms, infiltration basins or trenches, and grassy swales to allow a greater degree of runoff infiltration. In particular, the feasibility of routing dry weather flows to the sanitary sewer will be examined. Proposed maintenance practices include trail maintenance and manure/waste management.

The BMPs will also help to control erosion and sedimentation, and will prevent anthropogenic animal waste from entering waters of the state. Beneficial uses in both San Juan Creek and the beaches adjacent to the mouth of San Juan Creek will be improved. The project implements watershed/nonpoint source pollution education, outreach, awareness and training activities targeted at equestrian facilities. Though the project implements watershed/nonpoint source pollution education, outreach, awareness and training activities targeted at equestrian facilities, it primarily addresses water quality improvements and watershed management.

San Juan Capistrano – Grease Control BMPs at Grandfathered Restaurants

The City of San Juan Capistrano is an older city with many charming but aging restaurants that were constructed many years ago without any grease retention mechanism. Grease interceptors are highly effective in capturing grease generated in food facilities, but without them these old restaurants may potentially cause sewer line blockages, which may result in sewage spills. For this project, the City will work with the local restaurants to retrofit them and incorporate grease interceptors. The installation of grease interceptors on food facilities is a means of preventing sewage spills, but also a way of preventing bacteria from reaching San Juan Creek, an impaired water body for bacteria. San Juan Creek discharges into Doheny State Beach, a heavily visited recreation facility. Furthermore, capturing and eliminating grease from the sewer lines improves the operation of the sewer treatment plant, and increases its efficiency. This project will decrease the possibility of sewage spills, hence providing environmental and habitat protection and improvement. In addition, the project will include an education component to educate food facilities staff on how to deal with sewage spills in case they take place. The long-term benefits of this project include major reduction or elimination of grease in distribution sewer lines and in on-site private sewer lines, as well as increased potential for elimination of the impairment of San Juan Creek.

San Juan Capistrano – Low Flow Capture and Diversion Treatments, San Juan and Trabuco Creeks

This project will install 10 interceptors at the 10 main storm drain outlets along San Juan and Trabuco Creeks to collect urban water runoff. The low flows will be diverted into an adjacent sanitary sewer. The sewer main lines will bring this urban water to the SOCWA Recycled

Water Plant for treatment. Urban runoff contaminants such as oils, heavy metals, gasoline, pesticides, herbicides and pet litter will be removed.

The project will add an estimated 150 acre-feet per year to the City of San Juan Capistrano's water supply, reducing the City's reliance on imported water. Diversion of urban runoff will also aid native plant growth by elimination of toxins from the streambeds, improve surface water quality before potential percolation into the groundwater supply, and protect recreational opportunities associated with the Creeks. Pollutants from urban runoff, including high coliform bacteria levels, are the suspected cause of numerous beach closings in recent years. Reducing polluted runoff from stormdrains will improve water quality and thereby improve the beneficial uses in San Juan Creek, Trabuco Creek, and the beaches where the San Juan Creek ultimately discharges.

The rationale behind the project is to improve water supply reliability and efficiency by reusing urban runoff. The removal of the runoff will serve to improve downstream watershed habitats for native species and human recreation, and augment groundwater quality improvement potential. The further development of local non-potable water supplies for use on areas of high irrigation use in the City of San Juan Capistrano is also an important result, reducing dependence on the Bay Delta and Colorado River, also contributing to the development of recycled water supplies.

Laguna Hills – Oso Parkway Open Space Project

This project entails the conversion of portions of 39 acres of low value landscaping and weeds to high value upland and wetland riparian habitats along the south side of Oso Parkway between Moulton Parkway and Bridlewood Drive. The project will provide bio-filtration of urban run-off. This area is tributary to Sulphur Creek and Aliso Creek.

Laguna Hills – La Paz Open Space Project

This project entails the conversion of portions of 36 acres of low value landscaping and weeds to high value upland and wetland riparian habitats along the north side of La Paz Road between Moulton Parkway and Paseo de Valencia. The project will provide bio-filtration of urban run-off. This area is tributary to Aliso Creek.

SEWER AND FLOOD MANAGEMENT PROJECTS

Laguna Beach - Shaw's Cove Sewage Lift Station

A strategic sewer system improvement plan has been adopted by the City to comply with an EPA Order to improve the system reliability and reduce sewer spills in the City. The Shaw's Cove lift station has been in operation since the 1960's and needs to be upgraded to current standards. The facility is located on a coastal bluff area directly adjacent to the Pacific Ocean. The proposed project will develop the final plans and complete construction of the improvements to the Shaw's Cove sewage lift station. The facility has insufficient sewage storage capacity and lacks an emergency backup power supply. Therefore, the upgrades will improve the system reliability and reduce the possibility of sewage spills that may flow into the Pacific Ocean. This project will assist in the reliability of the sewage pumping system to reduce sewer spills, and help protect the Pacific Ocean environment and beneficial uses. Additionally, Shaw's Cove is immediately north of the Heisler Park Ecological Reserve and Area of Special Biological Significance.

The project was recently funded by the State Infrastructure Bank (I-Bank) through a low interest loan to the City of Laguna Beach and by a grant through the Federal State and Tribal Grant (STAG) Program. These sources of funding will finance the operation and maintenance of the project. Construction is scheduled to be complete in December 2006.

Laguna Beach / SOCWA - North Coast Interceptor Repair Project

The City of Laguna Beach and the South Orange County Wastewater Authority propose to undertake a joint project to improve an aging sewer line. A strategic sewer system improvement plan has been adopted by the City to comply with an EPA Order to improve the system reliability and reduce sewer spills in the City. The City's primary sewage transmission line is the North Coast Interceptor (NCI). The NCI is constructed of Asbestos Concrete Pipe (ACP) and has been in operation for 22 years. The NCI transports sewage from the City to the South Orange County Wastewater Authority coastal treatment plant located in Aliso Canyon.

Recent analysis concluded that sections of the NCI line has deteriorated and is in need of repair. One section of line of significant concern is the 24" NCI gravity siphon within the Aliso Creek. The segment begins at Coast Highway and continues for 6,500 feet along and adjacent to the Aliso Creek to the coastal treatment facility. The proposed project would relocate this section of the NCI gravity siphon line away from Aliso Creek.

The project will target system reliability and water supply efficiency; however containing sewage transportation is a crucial part of watershed management and pollution reduction.

San Juan Capistrano - La Novia Bridge Demolition and Reconstruction

San Juan Capistrano proposes to destroy and build a new La Novia Bridge to make it longer, higher, and wider. At its current state, the bridge forms a restriction to San Juan Creek, which increases the Base Flood Elevation in the area upstream of the bridge. By lengthening and raising the bridge, the City will increase the channel's hydraulic capacity. The existing

bridge, in its current condition, makes the surrounding roadway and residential areas highly susceptible to damage as a result of the restriction. By lengthening the bridge, there will be a definite improvement to a deficient levee system. The current condition causes breakout and erosion of the channel. The expansion of the new bridge will also incorporate treatment control BMPs to mitigate pollutants from the bridge. Other water quality improvements that may be included are being explored. Furthermore, the expanded bridge will provide bike, pedestrian, and equestrian trails as well as traffic turn lanes.

Through the proposed improvements to the bridge, watershed management and planning capabilities are enhanced. Erosion of the channel will be diminished, improving downstream habitats; and the installation of BMPs will address non-point source pollution reduction and management.

Laguna Beach - Canyon Acres Storm Drain Project

The Canyon Acres Storm Drain Project includes construction of a storm drain within Canyon Acres Drive from Laguna Canyon channel to the easterly cul-de-sac end of Canyon Acres, and a diversion junction to be located immediately downstream of the existing debris rack and headwall. The proposed project will allow low flows (non-storm flows) to remain in a natural creek, therefore providing a benefit to the downstream riparian habitat, while diverting storm flows to an underground storm drain pipe.

Canyon Acres Drive is located within a natural canyon surrounded by moderate to steep sloping terrain. The mouth of the natural canyon outlets to Laguna Canyon Channel, an improved channel that flows southwesterly to the Pacific Ocean, adjacent to and east of Laguna Canyon Road. The total drainage area at the proposed storm drain outlet to the Laguna Canyon Channel is approximately 247 acres.

City records document that storm flows exceed the existing creek's capacity about once every eight to ten years, with the residual flow spilling into the street. The maximum observed street flow depths were reported to be in the two-foot range. It has also been pointed out in numerous studies that even with the sizeable flow depths experience along Canyon Acres Drive, there was no known flood damage to the adjacent homes, which was credited to the existing building pads being constructed sufficiently above the existing street grade. However, the velocity of flow within Canyon Acres Drive is in the 10ft/sec to 15ft/sec range during the 100-year storm event, thus at this velocity a 1.3-foot depth of water does present a safety hazard to the residents, who could be swept off their feet.

The project will provide environmental benefits by reducing the need for City maintenance crews to clean the streets of sediment after each major storm by conveying the flows to an underground storm drain pipe in lieu of the street conveying these storm flows, and this will provide noise and air quality benefits. More significantly, the project will primarily address stormwater capture and improvement of flood control along the channel.

Laguna Beach - Atlantic Way Storm Drain

The Atlantic Way storm drain would consist of a 12" to 18" subdrain pipe and surface culvert half-way down the hill from Atlantic Way, ending with an energy dissipater where sound

sandstone surfaces in the slope, extending past the soft erodible soil uphill. The catch basin at Atlantic Way will be sized for the 25-year storm, as will the 12" to 18" pipe. The pipe and dissipater area of impact will be equal or slightly greater to the existing erosional/surficial instability area; approximately 280 feet long and 20 to 100 feet wide. In addition to the storm drain lateral, the existing eroded gully will be re-stabilized and possibly a terrace-drain/down-drain (Portland Concrete Cement, or PCC, valley gutters) will be constructed on the surface to protect the valley from the runoff sheet flows that will still occur, even with the pipe in place. A subdrain will be required along the bottom of the removal area. Lastly, the debris rack inlet at 547 Canyon Acres, which is at the bottom of the Atlantic Way side canyon, would require upgrading in order to keep flows and debris off of Canyon Acres Drive.

The proposed project will allow capture of concentrated storm flows that are currently causing significant erosion to the slopes above Canyon Acres Drive, while the proposed system from Atlantic Way will assist in diverting the existing sheet flows, which currently concentrate the flows without increasing the quantity of flow, into culver and subdrain system. The diversion does not take the existing flows into a new watershed, but will help the current erosion from exacerbating during a storm event. The proposed storm drain will serve a necessary drainage purpose to prevent potential degradation of topsoil, property damage, and potentially avoid a hazard to public safety. Other environmental benefits are provided by reducing the need for City maintenance crews to clean the streets of sediment after each major storm by conveying the flows to an underground storm drain pipe in lieu of the eroded gully currently conveying these storm flows. This affords noise and air quality benefits. The project will improve water quality, as it will reduce the amount of sediment currently being sent to Canyon Acres Drive from the slopes above. It will also allow capture of concentrated stormwater flows that cause erosion, which will improve flood control and watershed planning.

EDUCATION AND INFORMATION MANAGEMENT PROJECTS

Laguna Niguel - Orange Coast Watershed Center

The proposed Orange Coast Watershed Center will fill the regional need for a venue offering practical public education in the stewardship of watershed, energy and material resources. Through its many agency, institutional and non-governmental partners, the new facility's meeting rooms, classrooms, laboratory and gardens will offer recreational opportunities for residents, training programs for workers, educational programs for students, and inspiration for average citizens and future leaders. By physically modeling sustainable ideas, the Center will encourage all of them to incorporate the principles of environmental sustainability into their homes, businesses, and habits.

The project is planned as an educational center/demonstration project that will educate school children, inform the general public, be used to train workers, and inspire future leaders to pursue environmentally sustainable building, landscaping and maintenance practices. The project will both provide and demonstrate environmental benefits by capturing stormwater runoff and recycling it for graywater purposes in the building and for landscape irrigation. The center will be used for both educational and recreational purposes. Multiple benefits will accrue because the Center will both embody and demonstrate energy efficiency, on-site solar energy production, use of waste heat for building systems, use of recycled materials, hyper-insulation, etc. The project is related to water quality in that it will demonstrate Integrated Best Management Principles and collection and re-use of stormwater for building and landscape systems. By itself, the Center will not achieve significant pollution reduction, but is expected to inspire broad implementation of water-quality-promoting improvements across the community. This has future implications for technology improvements, watershed planning, ecosystem restoration and most importantly, water supply conservation and efficiency.

San Juan Basin Authority – GIS

The project includes development of a spatial database containing hydrogeologic information, land use and property ownership, aerial photography, and water quality data. The project will result in a Geographic Information System to be utilized as a watershed planning and analysis tool, and it may ultimately include a web-based interface for public access.

The project incorporates stormwater capture, storage, treatment, and management through GIS applications that identify existing projects as well as areas of the San Juan Basin for optimal basin management. Specifically, GIS would be used to identify key stormwater diversion points, surface water storage, and optimal groundwater recharge locations. GIS would be used to map and analyze surface geology and lithologic units underlying the San Juan Basin's shallow alluvial aquifer system. In this way, the project would enhance groundwater management capabilities by identifying geologic terrain related to surface and groundwater supply. The GIS would further be used to evaluate the efficacy of the integrated environmental monitoring program which was implemented as part of Phase I Desalter Program for the San Juan Basin. The project would provide accurate monitoring and analysis

for the overall affects of implementation projects. The database will provide a centralized repository for a variety of water supply, water quality, water, and watershed management data, greatly improving future planning efforts.

OTHER PROJECTS

SOCWA and OCSD - Enclosed Biosolids Composting Facility

This project would construct an enclosed biosolids and greenwaste composting facility at the Prima Deshecha Landfill in San Juan Capistrano. The facility would be jointly owned by SOCWA and Orange County Sanitation District with other possible public agency participants. It would process approximately 110 tons of highly treated biosolids per day to produce up to 75 tons of compost per day.

A project component may include composting of horse manure which will assist the City of San Juan Capistrano to reduce this type of pollution in San Juan Creek and tributaries, aiding the City's urban runoff pollution prevention program. Proper treatment and disposal of biosolids is an essential part of watershed management and planning in South Orange County. SOCWA and OCSD propose to reuse compost created by the project to benefit all public agencies in the County. Use of properly composted materials will reduce potential bacterial pollution in the watershed. Biosolids will be beneficially reused in the watershed rather than being disposed of in the landfill or to other locations. Organic compost can be used in the watershed in lieu of more harmful chemical or inorganic fertilizers. Diversion of biosolids and other usable materials (greenwaste construction debris, horse manure, food waste) will decrease use of precious landfill capacity and will assist local public agencies with AB 939 compliance. Additionally, the project is designed to make use of several materials to create a product which would displace chemical fertilizers. Reuse of these materials would keep them from being disposed of in a landfill, providing a longer life for the landfill. Compost materials are generally safe and friendlier to the environment than chemical alternatives. A reduction in truck hauling is also anticipated with the project, helping with traffic congestion and air pollution.

This project is best categorized as improved watershed management through efficient and organic disposal and reuse of biosolids and greenwaste that would otherwise remain significant pollutants in the ecosystem.

Trabuco Canyon Water District Water - Treatment Plant Security

As a result of the Vulnerability Self Assessment Test documentation developed last year, increased water system security is a requirement for the TCWD Dimension Water Treatment Plant. The Plant receives untreated water and provides full compliance with the surface water treatment rule and serves water to all of the District's customers.

The project accomplishes the goals of the grant program through video surveillance of gates, grounds and treatment building. This allows for local and remote viewing of surveillance cameras through a high speed internet camera system to verify alarm events. Improvements to gate access would be made through voice and video verification. This provides complete access control with full logging and reporting. New security fencing will also surround the plant to complete the security envelope. Security could contribute to water supply efficiency.

APPENDIX I

SOUTH ORANGE COUNTY IRWM PLAN PRIORITY A PROJECT DETAIL

Specific Priority A projects have moved forward in the planning process in preparation for implementation. Additional Priority A project detail has been achieved and is detailed in this Appendix for the following seven projects. Minor renumbering of the projects has been made here from the Priority A Project list in Section 4 to draw a distinction to the current order of priority.

1. Water Use Efficiency Program Expansion (Priority A projects 1a and 1b)
2. Gobernadora Multipurpose Basin
3. Heisler Park Marine Habitat Projection
- 4a. J.B. Latham Treatment Plant
- 4b. Recycled Water Transmission System Improvements - San Juan Capistrano
5. Recycled Water Treatment and Distribution - San Clemente
6. Aliso Creek Water Quality SUPER Project

Table I-1 includes the seven Priority A projects listed above and highlights the readiness to proceed for implementation and new project detail. Table I-1 provides detailed information to show consistency with IRWM Standards, as outlined by the State.

- » The Economic Feasibility column includes the funding match commitment and supporting documentation showing the commitment to project funding.
- » The Status of Implementation column includes the studies/reports that have been completed for the project to date, and therefore substantiate the immediate readiness to proceed with project implementation; specific project schedules are not reflected in this table.
- » The Potential Negative Impacts column references the environmental documents that assess project impacts.
- » The Data Gaps column identifies project specific data gaps, if present.
- » The Project Evaluation Performance includes measurement of success methods (in addition to the PAEP).
- » The Links/Integration of Projects and Levels of Planning column shows the agencies and levels of planning involved in project implementation.

Following Table I-1, additional project detail for each of the seven Priority A Projects is provided.

Table I-1: Priority A Project Detail – Top Seven Projects

Current Priority and Priority A Project Title	Economic Feasibility (Funding Match Commitment Financing)	Status of Implementation/Studies Completed	Potential negative impacts	Data Gaps	Project Performance Evaluation	Links/Integration of Projects and Levels of Planning
1. Water Use Efficiency Program Expansion	\$ 2,620,490 Secured funding sources: -Metropolitan Water District of Southern California (MWD) -Municipal Water District of Orange County (MWDOC), the County of Orange, and the City of San Clemente -National Resource Conservation Service (NRCS)	-LADWP Weather-Based Irrigation Controller Pilot Study, (August 2004) -Residential Runoff Reduction Study (July 2004) -Evaluation of the Landscape Performance Certification Program (January 2004) -ET Controller Savings Through the Second Post-Retrofit Year: A Brief Update (April 2001) -Residential Weather Based Irrigation Scheduling: Evidence from the Irvine "ET Controller Study" (June 2001) -Metropolitan Water District of Southern California: Weather Based Controller Bench Test Report (April 2004) -City of Laguna Niguel Assessment and Evaluation Plan for the Sulphur Solution Project, (March 2006) -A Guide to Estimating Irrigation Water Need of Landscape Plantings in California: The Landscape Coefficient Method and WUCOLS III, University of California Cooperative Extension and the Department of Water Resources (August 2000)	This project will have no negative impact to the environment as the project will provide incentives to encourage the installation of SmartTimers in new construction or replace existing irrigation timers or existing turf grass in single-family homes and commercial landscapes.	- The project will provide initial field data for refining the demand-reduction, water-efficiency, and non-storm runoff-reduction evaluation factors, as a next step toward a refined performance assessment tool for this type of BMP. This would ultimately prove useful in Load Reduction Planning for regional TMDLs, such as the Bacteria Load Reduction Plans that will start being developed in the Project area in 2007, and will fill this data gap.	Beyond the PAEP, the project will measure success based on a comparison between the outcome of the project and the anticipated outcome as concluded in the supporting studies.	The project is a combination of the Water Use Efficiency Program Expansion Phase 1 and GreenBack Program Phase 1. Project Implementation will occur across levels of planning between the following agencies: MWD, MWDOC, the County of Orange, and the City of San Clemente.

Current Priority and Priority A Project Title	Economic Feasibility (Funding Match Commitment Financing)	Status of Implementation/Studies Completed	Potential negative impacts	Data Gaps	Project Performance Evaluation	Links/Integration of Projects and Levels of Planning
2. Gobernadora Multipurpose Basin	\$7,500,000 Secured funding sources: Santa Margarita Bond and General Funds (Project included in District 5-Year Capital Improvement Program and funds are allocated for design/construction) and Rancho Mission Viejo (land and capital contribution).	-Preliminary Design Report Completion: May 31, 2006 - San Juan Creek and Western San Mateo Creek Watershed Special Area Management Plan (SAMP) EIS prepared by the US ACOE. -Southern Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan under development by the Ca Department of Fish and Game and the U.S. Fish and Wildlife Service which will be released July 2006.	Site specific biological assessments and preparation of site specific environmental documentation will include construction impacts of the project.	Currently, no data gaps exist. Project is ready for implementation.	Beyond the PAEP, the project will assess performance success by comparing the amount of storm flows attenuated; reduction of soil erosion and sedimentation; ecosystem health of Gobernadora Creek, the Gobernadora Ecological Resource Area (GERA), San Juan Creek, and the Pacific Ocean at Dana Point; reduction of urban runoff to lower Gobernadora and San Juan Creek; reduction in total coliform, Biological Oxygen Demand (BOD), total solids, ammonia, nitrogen and phosphates; and amount of reuse water.	Project implementation will be coordinated across levels of planning with the City of Rancho Mission Viejo, US Army Corps of Engineers, Ca Dept of Fish and Game, and County of Orange.
3. Heisler Park Marine Habitat Protection	\$ 800,000 Secured funding Sources: City of Laguna Beach General Fund.	-Heisler Park Master Plan improvements EIR (2005) - Geotechnical evaluation and landscape study (1999). -Coastal Impact Analysis (2004). - Urban Runoff Diversion Study Report (2001) - Programmatic mitigated negative declaration (2003) - Design plans and specifications (2006)	Potential negative impacts are identified in the Heisler Park Master Plan improvements EIR (2005), Section 3, pages 31-78.	Currently, no data gaps exist. Project is ready for implementation.	Beyond the PAEP, the project will assess performance based on changes in quality of the ASBS area, including the mitigation measures identified in the Heisler Park Master Plan EIR (Section 3.5.4-3.6.4, pages 87-89): -Reduction of the amount of surface water flowing	Project is linked to the overall Heisler Park Master Plan Improvements for the Heisler Park Ecological Reserve, which is a State designated marine area of special biological significance. Project implementation will be coordinated across levels of planning in the City of

Current Priority and Priority A Project Title	Economic Feasibility (Funding Match Commitment Financing)	Status of Implementation/Studies Completed	Potential negative impacts	Data Gaps	Project Performance Evaluation	Links/Integration of Projects and Levels of Planning
					directly over the cliff face to the ocean. -Reduction of natural groundwater seepage through bluff face to the ocean. -Stabilization of the cliff base to decrease excess erosion that may cause excess siltation to the marine environment and safety concerns about failure to the bluff area.	Laguna Beach, state agencies, and the County of Orange.
4a. J.B. Latham Treatment Plant – AWT	\$10,923,139 Secured funding Sources: -City of San Juan Capistrano Recycled Water Funds -Moulton Niguel Water District Recycled Water Funds -South Coast Water District Recycled Water Funds	-SERRA AWT and Pipeline Project (1994) Reclaimed Water Market Assessment and Facility Analysis – SERRA AWT (1991) -USBR, Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS)– Final Report (2002) -USBR, SCCWRRS – Short Term Implementation Plan (STIP) Report (2002) - JB Latham Advanced Wastewater Treatment Facility, Preliminary Design Report (2000)	Potential negative impacts are identified in the USBR, Southern California Comprehensive Water Reclamation and Reuse Study – Final Report (2002), Section 3.5 and Section 5.3.6.3.	Currently, no data gaps exist. Project is ready for implementation.	Beyond the PAEP, the project will monitor meter use and water quality runoff requirements. The Project outcome will be compared with goal of creating a long-term recycled water strategy, as proposed in the United States Bureau of Reclamation, Southern California Comprehensive Water Reclamation and Reuse Study – Final Report (2002).	Project is directly linked to the sister project, Recycled Water Transmission System Improvements Project. Project implementation will be coordinated across several levels of planning with SOCWA, the City of San Juan Capistrano, Moulton Niguel Water District, South Coast Water District.
4b. Recycled Water Transmission System Improvements	\$52,484,890 Secured funding Sources: -Metropolitan Water District of Southern California Local Resources Program	The following studies have been completed: -2005 Recycled Water Master Plan -2006 Recycled Water Financial Master Plan -USBR Southern California Comprehensive Water	- Revised Mitigated Negative for the City of San Juan Capistrano Non-domestic/Recycled Water Master Plan Update: Section 2.5 Evaluation of Environmental Impacts	No data gaps at this time, ready to proceed with project.	Beyond the PAEP, the project will perform monitoring of metering use and runoff water quality measurements.	Project is directly linked to the sister project, J.B. Latham Advanced Water Treatment Project. Project implementation will be coordinated across several levels of planning

Current Priority and Priority A Project Title	Economic Feasibility (Funding Match Commitment Financing)	Status of Implementation/Studies Completed	Potential negative impacts	Data Gaps	Project Performance Evaluation	Links/Integration of Projects and Levels of Planning
	<ul style="list-style-type: none"> - Non-Domestic Water System Developer Charges - Non-Domestic Water System Sales Revenue 	<ul style="list-style-type: none"> Reclamation and Reuse Study -USBR Southern California Comprehensive Water Reclamation and Reuse Study-Short term implementation plan report. -2000 J.B. Latham Advanced Water Treatment Plant Feasibility Study -San Juan Basin 15 Wells Study -San Juan Basin Groundwater Management and Facilities Plan 	discusses potential negative impacts (pages 2-4-2-27).			with SOCWA, and the City of San Juan Capistrano.
5. Recycled Water Treatment and Distribution	\$ 8,400,000 Secured funding Sources: <ul style="list-style-type: none"> -Water Acreage Fee Reserve \$2,000,000 -Sewer Connection Fee Reserve \$6,400,000 	The following studies have been completed: <ul style="list-style-type: none"> -1994 Recycled Water Master Plan -2006 Water Master Plan -City of San Clemente Master Reclamation Permit (R9-2003-0123) 	Two basins will be affected by the proposed project, including the Prima and Segunda Deshecha Canada. Such impacts will be mitigated through the City's Master Reclamation Permit that places limitations on levels of constituents in irrigation water. The CEQA process will provide mitigation for any potential negative impacts.	The 1994 Recycled Water Master Plan analyzed the areas within the City of San Clemente that could be connected to recycled water. Data gaps may exist with regard to refining the size in response to changes that may have occurred since 1994. A update to the Recycled Water Master Plan is anticipated to be completed by December 2006.	-Beyond the PAEP, the project will evaluate performance by comparing the project outcome with the project feasibility and design recommendations included in the 1994 Recycled Water Master Plan.	-The Project serves as a critical component to integrating recycled water within the region as a local source of supply, and thus offsetting import water demand for the region.
6. Aliso Creek Water Quality SUPER (Stabilization,	\$ 41,647,994 Funding Sources: <ul style="list-style-type: none"> -In-kind: County of Orange, SOCWA, 	The following studies have been completed: <ul style="list-style-type: none"> -Aliso Creek Concept Plan Report (2006) 	Measurement of potential negative impacts are described in Aliso Creek Alternatives Analysis Report	Missing data/information includes the environmental	-Beyond the PAEP, the project will evaluate performance by comparing the outcome of	The Project integrates the Aliso Creek Mainstem Ecosystem Restoration and Emergency Sewer

Current Priority and Priority A Project Title	Economic Feasibility (Funding Match Commitment Financing)	Status of Implementation/Studies Completed	Potential negative impacts	Data Gaps	Project Performance Evaluation	Links/Integration of Projects and Levels of Planning
Utility Protection, Environmental Restoration) Project	MNWD, SCWD -Cash: SOCWA, MNWD, SCWD - U.S. Army Corps of Engineers -Aliso Creek Watershed Study, Economic Technical Appendix (1999)	-Aliso Creek Watershed Management Study (2002) -Aliso Creek Alternatives Analysis Report (1999) -Aliso Creek Watershed Management Study Without Project Conditions (1999) -SOCWA sludge pipeline alignment study (2006) -Screencheck Program EIR (2002).	(1999) (page 4-2 – 4-20).	permitting and plans/specifications/cost estimates, which will be completed after May 2007.	the Aliso Creek Watershed Management Study Without Project Conditions (1999) to the results of the project.	Replacement Project, and the Water Harvesting on Aliso Creek Project. SOCWA, MNWD,SCWD and the County will work across levels of planning to implement.

Project detail for the Priority A top seven projects proposed for implementation from the IRWM Plan are show below. Each project includes a description, goals, objectives, scientific basis, and metrics.

1. Water Use Efficiency Program Expansion – Municipal Water District of Orange County

Description

In South Orange County approximately 179,000 single-family homes and 10,000 commercial landscapes use irrigation timers to manage landscape irrigation (210,851 square foot homes x 85%). These timers require regular irrigation scheduling adjustments by the site manager to assure sufficient irrigation water is applied throughout the year. In general, irrigation schedules programmed into these timers are more generous than needed and are not frequently adjusted causing excess irrigation and nuisance runoff.

The Water Use Efficiency Program Expansion (WUEPE) project combines the SmarTimer Program (Project 1a) with the GreenBack Program (Project 1b) to install up to 2,450 “SmarTimer” irrigation controllers in new and existing residential (1,200) and commercial (1,250) landscapes, and to correct and improve landscape irrigation distribution systems for up to 292 participants using a Rebate Program format. This effort is anticipated to save more than 1,050 AF/YR and reduce runoff and non-point source pollution associated with these properties by more than 50 percent.

Prospective participants will be offered rebate incentives to avoid installation of antiquated timers in new construction or to replace existing antiquated irrigation timers for existing landscapes. Unlike antiquated timers that require action by the site manager to reprogram the irrigation schedule regularly, new SmarTimers are considered state-of-the-art because they automatically adjust irrigation schedules as weather conditions change without action by the site manager. SmarTimers alone have been proven to save water and to reduce runoff and pollution per the findings in *The Residential Runoff Reduction Study* (July 2004).

Poorly maintained irrigation systems and poorly designed landscapes also contribute to excess irrigation and nuisance runoff. Characteristics of poorly maintained irrigation systems include broken and miss-directed sprinkler heads, excess pressure, miss-matched precipitation rates between sprinklers while characteristics of poorly designed landscapes include stretched sprinkler spacing, mixed-hydrozones and inappropriate plant selections.

Therefore, the WUEPE project incorporates a pilot element aimed at additional water savings and runoff reductions where wasteful irrigation distribution system deficiencies can be corrected. WUEPE’s GreenBack program element will also target irrigation distribution system improvements, such as changing from wasteful overhead spray sprinklers to highly-efficient drip emitters, as well as support the conversion of water-thirsty grass lawn areas to drought-resistant plants. Changing plant species can reduce water demand at a site by 50-85 percent, as estimated in the *Guide to Estimating Irrigation Water Needs of Landscape Plantings in California* (University of California Cooperative Extension, available at www.owue.water.ca.gov/docs/wucols00.pdf).

MWDOC, retail water agencies, and cities have gained considerable experience implementing a similar county-wide SmarTimer controller project since October 2004. In addition, two local cities piloted a similar GreenBack rebate program, which included

irrigation system improvements and plant species conversions, in 2005-2006. The WUEPE Project will be managed by MWDOC using a Rebate Administration Contractor to facilitate incentives, and will utilize Resource Conservation District technicians to inspect SmarTimer installations, evaluate irrigation system deficiencies, and confirm irrigation system corrections and distribution system updates. The rebate incentives will not exceed the total cost of the SmarTimer purchase and installation, thereby avoiding a gift of public funds.

Further, all commercial landscapers that participate in the WUEPE Project will automatically be enrolled in MWDOC's Landscape Performance Certification Program. This program provides monthly irrigation performance reports, customized to each site, to the property owner, property manager, and landscape maintenance contractor. The Irrigation Performance Report is accessed on the program website, and quantifies the amount of water applied to the landscape by using metered water use data from retail water agencies and comparing it to the amount of water that should be applied based upon the budget. The budget is calculated based upon the irrigated area, plant palette, climate zone, and irrigation system efficiency. This program will monitor water use of program participants, but will be operated and funded independently of the WUEPE Project.

Integration/Larger Project

The Municipal Water District of Orange County was awarded a Proposition 13 grant to conduct a pilot implementation program, known as the SmarTimer Rebate Program, to begin testing a rebate implementation methodology as a final step toward regional program implementation. This pilot implementation SmarTimer Rebate Program was implemented from late 2004 to early 2006.

Goals

The goals of this project are to: 1) save valuable water supplies, thereby reducing the region's reliance on State Water Project water and improving water reliability; 2) reduce nuisance runoff by better managing landscape irrigation; and 3) reduce non-point source pollution loads by reducing the nuisance runoff that carries the pollutants to local receiving waters. The renewed landscapes will also require less fertilizer and pesticide application, and will promote on-site infiltration of stormwater, improving watershed ecosystem health.

Overall, the project would significantly contribute to the goal of water conservation in the Region and would further improve overall watershed and coastline ecosystem health. Thus, the Project is consistent with the goals of the IRWM Plan.

Objectives

The Project meets objectives WC-1, WS-1, WQ-1, IF-1, and IF-2.

Scientific Basis

SmarTimers, by themselves, have been proven to save water and reduce runoff and pollution loads by reducing nuisance runoff that carries the pollutants to local receiving waters per the findings in *The Residential Runoff Reduction Study*. MWDOC, retail water agencies, and cities have gained considerable experience implementing a similar county-wide SmarTimer Rebate Program since October 2004. Nearly 1,200 SmarTimers have been installed throughout Orange County, which have resulted in 420 acre feet of water savings annually, and an estimated 50 percent pollutant load reduction from those sites of nuisance runoff that carries the pollutants to local receiving waters.

Additionally, the WUEPE project incorporates a pilot element targeting irrigation distribution system improvements. This element is proven to result in additional water savings and runoff reductions when wasteful irrigation distribution system deficiencies are corrected. For example, if the distribution uniformity (how evenly the irrigation water is applied to the landscape) is improved by 10%, there would be a corresponding increase in efficiency. This efficiency would be captured through adjusting the base irrigation schedule programmed into the SmarTimer at the site. This concept of improved distribution uniformity is well documented in the *Irrigation Training and Research Center Landscape Water Management Auditing Manual (2002)*.

Based on water savings rates identified in the Residential Runoff Reduction Study, the Project retrofits could save more than 1,050 AF/YR (assumes 41 gallons per day per single-family home and 545 gallons per day per commercial landscape) and reduce runoff and non-point source pollution associated with these properties by more than 50 percent.

Studies have proved that expanding application and use of ET technology to manage irrigation water for residential homes and large landscape areas, as well as commercial uses, will produce beneficial results linked to watershed management. Based on the results of the existing SmarTimer controller project, existing weather-based ET irrigation control technology study results, and participation levels, it is certain that the WUEPE project will realize high participation and produce the stated water savings and water quality results.

Metrics

Metered water billing data before and after installation of smart irrigation controllers and irrigation distribution uniformity improvements will be used to demonstrate reduction in water units (1 unit = 100 cubic feet) for participating properties. In addition, benefits of reduced runoff and water quality improvements will be extrapolated for this project using statistically validated data from the Residential Runoff Reduction Study published by MWDOC in July 2004. In addition, photo monitoring at a representative sampling of participating sites will be performed to document quality of landscapes, presence of Smart Irrigation Timers, and presence of runoff.

2. Gobernadora Multipurpose Basin – Santa Margarita Water District

Description

SMWD is proposing to construct a basin adjacent to the existing Canada Gobernadora to divert the low flow urban runoff and to attenuate storm flows. Based on the regional hydrology, geotechnical studies and field topography, the Basin will consist of an urban runoff and storm detention basin that will be established as a wetland and riparian habitat, a collection system to capture and divert flows from the constructed wetlands, a pump station and pipeline to connect to the existing Portola Reservoir system. The Basin will be utilized to reduce storm peak flows by flood storage, divert and naturally treat urban runoff and storm flows to 1) reduce downstream erosion and sedimentation, 2) address excessive surface water and groundwater, and 3) improve the water quality in the Gobernadora Creek and San Juan Creek.

Construction of the community of Coto de Caza started in the late 1960's in the upper portion of Canada Gobernadora which is a sub-basin (Basin Number 1.24) within the San Juan Creek Watershed. The drainage system primarily uses surface flow to Canada

Gobernadora to route urban runoff and storm flows to San Juan Creek and ultimately the Pacific Ocean. The system was built to the standards in existence at the time of construction and does not include provisions for attenuation of the storm flows, flood mitigation or pollution control. Consequently, the downstream areas are impacted by increased flows, non-native water, and trash and debris.

The Santa Margarita Water District (SMWD) owns and operates the 500 acre-foot open air Portola Reservoir in Coto de Caza for irrigation of the slopes, parks, and golf courses. The demand on the reservoir is approximately 1,200 acre-feet per year and is supplied with imported water. SMWD is promoting weather based irrigation controllers and providing education opportunities to the community to reduce water demand and urban runoff. Moreover, Portola Reservoir affords a unique opportunity for the region by providing storage to allow for the capture and reuse of foreign developed water substantially reducing the need for imported water.

SMWD proposes to construct the Gobernadora Multipurpose Basin (Basin) to respond to:

- Erosion and sedimentation along Gobernadora Creek caused by unmitigated flows from the Coto de Caza development
- High storm flows damaging the downstream restoration habitat area,
- Capture of foreign developed water to reduce imported water demands

Goals

Successful implementation of the Basin is anticipated to result in reaching the following goals:

1. Attenuation of storm flows, reduction of soil erosion and sedimentation, and removal of excess surface and groundwater. These problems that are currently damaging Gobernadora Creek and the Gobernadora Ecological Resource Area (GERA), and present obstacles to the restoration of Gobernadora Creek advocated by the participants in the Special Area Management Plan (SAMP) and Natural Communities Conservation Plan (NCCP), including state and federal resource agencies, are a concern to the Army Corps of Engineers.
2. Higher quality of water, specifically a reduction in total coliform, Biological Oxygen Demand (BOD), total solids, ammonia, nitrogen and phosphates utilizing natural vegetated treatment methods instead of chemicals.
3. Protection of beneficial uses of the Basin, including contact and non-contact recreation, cold and warm freshwater habitat, and wildlife habitat.
4. Reduce demand for imported water by capture and reuse of a valuable water resource decreasing the need to utilize domestic water for nonpotable purposes.

Objectives

The project will meet several objectives of this Plan, including WQ-1, AE-1, AE-2, WS-1, and WS-4.

Scientific Basis

The methodology behind storm detention basins and water treatment is scientifically justified, with the Basin possessing proven constructed wetlands technology to increase the water quality in Canada Gobernadora for collection and reuse in the irrigation system.

Metrics

Metrics will be based on the 1999 concept plan prepared by SMWD, which was used as the basis of the submittal for Proposition 13 funding. Subsequently, the plan has been modified and expanded based on the success of the development of the Horno Detention Basin within Ladera Ranch. SMWD is preparing a preliminary design report and updated cost estimate for the project. The preliminary design report includes:

- Hydrology and geotechnical study findings including groundwater elevations, design constraints for flood storage, water recovery safe yields, daily dry weather inflows and water quality.
- Floodplain mapping and sediment transport and delivery
- Alternative formulation and analysis including basin sizing, limitations of upstream flooding, flood mitigation and basin sizing

Additionally, the basin has been included in the San Juan Creek and Western San Mateo Creek Watershed Special Area Management Plan (SAMP) Environmental Impact Statement prepared by the U. S. Army Corps of Engineers and will be included in the proposed Southern Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan being prepared by the County of Orange in cooperation with the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

3. Heisler Park Marine Habitat Protection Project – City of Laguna Beach

Description

The City's Heisler Park needs to be renovated to protect the adjacent Heisler Park Ecological Reserve, which is a State designated area of special biological significance (ASBS), and to help preserve the park. This project will help the City comply with a State Water Resources Control Board mandate prohibiting discharges from the urbanized watershed area to the ecological reserve.

The ecological reserve and park are both regionally and locally significant. This area is a main attraction for the more than 3 million people who visit the City each year for the natural beauty and recreation opportunities. The project will assist in meeting the San Diego RWQCB coastal bacteria TMDL.

The proposed project is to complete construction of the following park improvements:

- » A controlled and efficient irrigation system;
- » Landscape grading;
- » Surface and storm drain improvements;
- » Bathroom replacements; and
- » Coastal bluff stabilization.

The project goal is to protect and reduce urban runoff pollution to the Heisler Park Ecological Reserve, a State designated ASBS. The project will include a runoff monitoring program consistent with State surface water monitoring criteria.

Overall, the project will preserve the park for recreational uses, as well as flood mitigation and groundwater protection objectives. The project will also facilitate a better understanding of watershed planning through the project design effort and public outreach.

Goals

The Project goals include the following:

- Water Conservation through a controlled and efficient irrigation system design
- Maximize the infiltration of runoff in landscape areas
- Diversion of non-storm runoff to the sewer system
- Filtering of storm water flows to remove gross pollutants
- Reduced possibility of sewer spills from facilities
- Reduce excess erosion of the coastal bluff area
- Treatment of diverted runoff at the wastewater facility
- Improved public safety through shoreline stabilization

Objectives

Objectives that will be achieved through this project include the following: WC-1, WQ-1, WS-4, AE-1, and AE-2.

Scientific Basis

The scientific basis is derived from measuring the known pollutants in urban runoff that may harm environmental resources. The project will implement management measures that are widely recognized as effective methods to control and reduce urban runoff pollution. Several studies have been completed supporting the Project design including the following: A Geotechnical Evaluation of the Park Erosion Control and Landscape Study (1999); Coastal Impact Analysis (2004); Urban Runoff Diversion Study Report (2001); Programmatic Negative Declaration (2003); and a Heisler Park Master Plan EIR (2005).

Metrics

The monitoring program will gather data on the volume of discharge and the quality of the runoff. The volume and amount of pollutants removed will be determined to the extent possible. Calculation of pre- and post-construction water usage data for the Heisler Park and implementation of the project QAPP and Monitoring Plan will provide detailed performance measurements.

4a. J.B. Latham Treatment Plant – Advanced Water Treatment Project – South Orange County Wastewater Authority

Description

The South Orange County Wastewater Authority proposes to design and construct an 9.0 million gallon per day advanced water treatment facility (“AWT Project”) at the J.B. Latham Regional Wastewater Treatment Plant in Dana Point, Orange County, while making space and piping accommodations for the possibility of a future expansion to 11.0 mgd. The AWT Project works as a component of several other projects for distribution of recycled water in the area. The City of San Juan Capistrano (CSJC) is proposing the construction of a recycled water distribution system in its service area in order to distribute recycled water produced by this facility. Moulton Niguel Water District (MNWD) and the South Coast Water District (SCWD) will either expand or enhance their recycled water distribution systems in order to utilize the water produced by this facility. Eventually, this project may also be a component of a groundwater recharge program, and or a saltwater intrusion barrier well injection system to be instituted by the San Juan Basin Authority in the San Juan Basin.

The AWT Project would be constructed in one phase with three participating owners; CSJC, MNWD, and SCWD. The project is directly linked with 4b- Recycled Water Transmission System Improvements (explained below), since the latter project will provide the distribution system required for the AWT. The project would provide recycled water for a variety of uses, thus, reducing potable water use. In addition, the project would provide water for groundwater basin recharge use and recycled water for irrigation at various sites. Groundwater basin recharge and recycled water irrigation use are both proven scientific methods for safely and effectively managing groundwater source and supply based on hydrogeologic studies. Efficient irrigation will allow for recreational uses, such as golf courses, parks, schools, medians, and other landscaped areas. The project will also significantly reduce the amount of secondary treated wastewater effluent containing bacteria that are disposed of in the ocean off of Doheny State Beach in Dana Point. A preliminary design report was completed in August 2000 by CGvL Engineers. For planning purposes, this document is considered a 10% design report. The AWT Project partnership of CSJC, MNWD and SCWD, expect to begin the final design report in May 2007.

Integration/Larger Project

The project works as a component of several other projects for distribution of recycled water in the area. The City of San Juan Capistrano is proposing the construction of a recycled water distribution system in its service area in order to distribute recycled water produced by this facility (see project 4b description below). MNWD and SCWD will either expand or enhance their recycled water distribution systems in order to utilize the water produced by this facility. Eventually this project may also be a component of a groundwater recharge program instituted by the SJBA in the San Juan Basin.

Goals

The plant will meet the goal of expanding water supply reliability by reducing the amount of reusable water being discharged to the ocean, and provide a new source for non-domestic uses. Such reclamation is an important aspect of overall watershed management, providing a potential supply for basin recharge and water quality improvements as well. This facility would also reduce the amount of bacteria laden secondary treated effluent, which is discharged to the ocean through the San Juan Creek Ocean Outfall. The reduction in outfall discharge may help to improve the quality of the ocean water adjacent to the outfall which discharges 2 miles off Doheny Beach in Dana Point, a widely used beach area in the south part of Orange County. The project meets the goals of water supply enhancement.

Objectives

The project also implements objectives WS-1, WS-2, WS-3, WS-4, and WC-1.

Metrics

Recycled water activity in the SOCWA service area is controlled by Waste Discharge Permit (Order No. 97-52) issued by the San Diego Regional Board. As part of the permit requirements, SOCWA and its member agencies are required to monitor production, use and quality of the recycled water developed and used in the service area. Monthly, quarterly and annual reports are required to monitor TDS, turbidity, and some 30 different constituents. All of these reports are available through the Regional Board and SOCWA. Annually, the agency is required to map the application of recycled water to verify that it

has not exceeded the water quality objectives set forth in the Basin Plan. SOCWA is also required to monitor fecal Coliform and chlorine contact time on a regular basis to insure that the recycled water produced meets the limits set in the Waste Discharge Permit. SOCWA also monitors the amount of recycled water produced and provides this information on a monthly basis to the member agencies and to the Regional Board. SOCWA will be able to show accurately exactly how much of the potable water supply is offset by the production of recycled water at the new AWT facility.

Scientific Basis

The treatment plant currently produces full secondary treated effluent which can be disposed of in the ocean in accordance with the NPDES permit (No. CA 107417). The facility would treat secondary effluent to the tertiary level in accordance with Title 22 of the California Code of Regulations. At this point, the recycled water may be used for irrigation purposes in accordance with these regulations.

4b. Recycled Water Transmission System Improvements – City of San Juan Capistrano

Description

The San Juan Capistrano Recycled Water Transmission System Improvements Project will construct a recycled and non-domestic water system consisting of four reservoirs, five pump stations, and 28 pipeline segments totaling 102,000 lineal feet. This represents the next phase of improvements to the recycled water system, and shall distribute approximately 4,000 AFY to areas in San Juan Capistrano, Dana Point, San Clemente and Mission Viejo not currently served by a reclaimed water source.

The City of San Juan Capistrano's 2005 Recycled Water Master Plan has identified customers with an average day demand of 4,000 AFY of recycled water and low quality groundwater. The use of recycled and local non-domestic well water will reduce demand on domestic water and reduce the overall cost of service to the City's customers. The Master Plan recommended construction of \$74,175,000 in non-domestic facilities, including approximately \$16,690,000 for the construction of a recycled water plant at the South Orange County Wastewater Authority operated J.B. Latham Plant Sanitary Sewer Treatment Plant (JBL –AWT). The JBL-AWT is a sister project to this one and has been submitted as a separate regional project by SOCWA.

The primary constraint to the expansion of the existing City of San Juan Capistrano non-domestic water system is the deficiency in sources of supply. Accordingly, a high priority is given to the development of the sources of supply. The schedule plans for Hollywood Well 2A and Well 5 to be re-drilled in 2007. Design of the Advanced Water Treatment Plant (SOCWA sister project) will begin in 2007. Construction will be completed by 2010. The 12-inch transmission pipeline in Rancho Viejo Road that will temporarily convey water from MNWD to the City's system is scheduled for construction in 2006. Pipelines that can be constructed from the existing system to serve non-domestic water to customers in Zone 350 and Zone 425 are scheduled for construction in 2006 and 2007. The design of each new reservoir is scheduled in one year and is then followed by two years of construction of pipelines. By 2014 the additional distribution lines, pump station and reservoir will be completed..

Ultimately, this project aims to distribute local groundwater and recycled water sources for non-domestic use. In addition, the Project will significantly contribute to the development of local supply reliability, will protect the community from drought, and will reduce dependence on imported water. Distribution of recycled water may lead to a reduction of non-domestic well use in the area, increasing the available groundwater supplies for domestic water use through treatment. This improves groundwater banking programs, and reduces imported water from the Bay Delta and Colorado River.

Goals

Ultimately, this project aims to distribute local groundwater and recycled water sources for non-domestic use. In addition, the Project will significantly contribute to the development of local supply reliability, will protect the community from drought and will reduce dependence on imported water. Distribution of recycled water may lead to a reduction of non-domestic well use in the area, increasing the available groundwater supplies for domestic water use through treatment. This improves groundwater banking programs, and reduces imported water from the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay Delta) and Colorado River, consistent with the goals of the IRWM Plan and this proposal.

Objectives

The project also meets objectives WS-1, WS-2, WS-3, WS-4, GM-1, SF-1, and SF-2.

Scientific Basis

This proposed project is supported by several studies, including the following: 2005 Recycled Water Master Plan (AKM Consulting, December 2005), 2006 Recycled Water Financial Master Plan (AKM Consulting, May 2006), United States Bureau of Reclamation Southern California Comprehensive Water Reclamation and Reuse Study (CH2M Hill, July 2002), United States Bureau of Reclamation, Southern California Comprehensive Water Reclamation and Reuse Study – Short Term Implementation Plan (STIP) Report (CH2M Hill, July 2002, 2000 Jay B. Latham Advanced Water Treatment Plant Feasibility Study (CGvL Engineers, August 2000), San Juan Basin 15 Wells Study (Geotechnical Consultants, Inc., June 2001), San Juan Basin Groundwater Management and Facilities Plan (NBS Lowry, May 1994)

Metrics

The metrics will be measured in AFY. The Master Plan recommended construction of \$44,366,000 in non-domestic facilities, including approximately \$14,000,000 for the construction of a recycled water plant at the SOCWA operated J.B. Latham Regional Wastewater Treatment Plant. The project need is supported by the City's Water Master Plan.

5. Recycled Water Expansion – San Clemente

Description

The City's recycled water expansion consists of a 2.2 million gallons per day (MGD) tertiary treated recycled water treatment plant expansion, 2.2 million gallons (MG), reservoir, pump station, booster pump, interconnection, 5 pipeline transmission main segments totaling 12,600 linear feet and onsite customer conversions. The expansion of the Water Reclamation Plant will consist of 2.2 MGD which consists of doubling the size of

the chlorine contact chamber, modifications to the chlorine mixing, and discharge pumps that will lift water to a new reservoir at approximately 400 feet in elevation. The pumps will be designed with a capacity of 2,200 GPM with 300 feet of static lift and 150 horsepower. The electrical will also need to be modified. This is a high priority project with design and construction taking one year.

Since the City does not have any storage within the system, a 2.5 MG reservoir known as Vera Cruz Reservoir will be constructed with a high water elevation of approximately 400 feet above mean sea level. The site for the reservoir is owned by the City and has been designated as the location for a future reservoir. In addition to the construction of the reservoir, an existing 16 inch pipeline will be extended onsite to the reservoir. This is a high priority project with design taking one year and construction also taking approximately one year.

La Pata Pump Station is needed to continue recycled water service to Pacific Golf Course. The pump station will lift water from the reservoir Hydraulic Grade Limit (HGL) of 400 to 600 feet and will serve both Pacific Golf Course and a future City park site. The pump station is high priority and must be completed and in service prior to completing construction of the reservoir and treatment plant expansion. Design and construction will also take one year to complete.

The pipeline projects consisting of Frontera, Del Cerro, Vera Cruz and Shorecliffs pipelines which extend the existing system to reach new customers. The pipelines will be installed in the public right-of-way or on City owned property with the exception of a portion of the Shorecliffs Pipeline which is proposed within the Caltrans I-5 right-of-way. Del Cerro Booster Pump is needed to lift water to serve a park, school, medians, and slopes associated with the Del Cerro Pipeline. The pipelines have been sized in the 1994 Recycled Water Master Plan, but the updated master plan will further define the sizes since new pipelines have been added subsequent to the 1994 master plan copulation in the last few years. The priority of these projects is lower than the other infrastructure projects discussed. Additional supply and storage is necessary prior to expanding the piping system. Design will take one year to complete and construction will take another year.

To improve reliability an interconnection is recommended as part of this project. Both agencies understand the benefits of the connection and are working together to formulate a Memorandum of Understanding or agreement. An interconnection on Avenida Pico will provide service between the City and Santa Margarita Water District. This connection will benefit both agencies in time of an emergency or plant upset in which recycled water can not be produced. Although during times of peak demand, the potential for sharing water will be reduced, the benefits of being able to have the interconnection will ultimately reduce both agencies demand for imported water. This project is a high priority and will be one of the first projects to be completed. Design will take nine months and construction will take six months.

The final phase of work will consist of retrofitting the customers landscaping irrigation system to provide signage, separation between potable and recycled water systems, and to assure there are no cross-connections issues between the water and recycled water systems.

All of the previous infrastructure improvements must be completed prior to completing this phase of construction. The conversion of the sites will take two years. Therefore, it is expected that within 3.5 years of beginning this project that enough existing domestic water users will have been converted to recycled water use to save 500 (AFY) of domestic water. Within 4.5 years all conversions will be completed with an additional 430 AF per year. The project will save 930 AF per year of domestic imported water if the recycled water improvements were not constructed. The project will also keep the City from having to purchase additional supply of 2.7 cubic feet per second (CFS), to meet maximum week demands and reduce the need form emergency storage by 5.6 million gallons.

Goal

The project will specifically reach the goal of increasing supply reliability and reclamation activities on a citywide level. The interconnection will improve supplier recycled water reliability, as well as allow for future storage of excess recycled water in a planned storage facility. The project will prevent the potential for loss of landscaping if water rationing is required in drought conditions.

Objectives

The project will meet objectives WS-1, WS-2, WS-3, and WS-4, as outlined in the “Objectives” Section.

Scientific Basis

The scientific basis for the project is driven by the standards for water reclamation and tertiary treatment. The project is supported by the City’s Recycled Water Master Plan (1994) and the Water Master Plan (2006).

Metrics

Metrics for this project will include million gallon per day measurements or acre-feet per year quantifications. With this expansion, the City’s current treatment capacity will increase from 2.2 to 4.4 million gallons per day (MGD), and will increase demand from 1,370 to 2,300 acre feet per year (AF/YR). This increase in supply will reduce the City’s dependency on imported water and keep the City from needing to purchase additional potable water capacity.

6. Aliso Creek Water Quality SUPER (Stabilization, Utility Protection, Environmental Restoration) Project – County of Orange, SOCWA and Moulton Niguel Water District

Description

This project originally started out as 3 separate projects. During the IRWMP planning process, it became clear that these projects had a direct link to each other, and should be combined. These projects included:

- The Aliso Creek Mainstem Ecosystem Restoration Project (County)
- The Aliso Creek Emergency Sewer Relocation Project (SOCWA/MNWD)
- Water Harvesting on Aliso Creek (SCWD).

In response to the expansion and development of the project, the Aliso Creek Concept Plan Report was prepared in February 2006 to combine the Aliso Creek Mainstem Ecosystem Restoration Project; Aliso Creek Emergency Sewer Protection Project and the Aliso Creek Water Harvesting Project.

The County of Orange (County), South Orange County Wastewater Authority (SOCWA), Moulton Niguel Water District (MNWD), and South Coast Water District (SCWD) propose to provide water quality benefits, stream bank stabilization, utility infrastructure protection, and ecosystem restoration in the Aliso Creek for the reach beginning at the AWMA Road park entrance and ending downstream at the Pacific Ocean.

The water quality treatment and beneficial use component of the project includes diversion of the low flows of Aliso Creek just upstream of the Pacific Coast Highway; treatment of the water to beneficial use standards; and the sale of that water to users in the watershed for irrigation.

The stabilization and ecosystem restoration component of the project will include: constructing a series of low riprap drop structures for grade control and reestablishment of aquatic habitat connectivity; shaving of slide slopes to reduce vertical banks; invasive species removal and riparian revegetation and restoration of floodplain moisture.

The infrastructure protection component of the project will include locking the low flow channel in place through placement of rock at the toe of the channel and soil wraps above the rock.

The project proposes a multi-objective approach to Aliso Creek watershed development and enhancement, accommodating water quality improvements, channel stabilization, flood hazard reduction, economic uses, aesthetic and recreational opportunities, and habitat concerns.

The project is aimed at water supply efficiency and system reliability through reclamation, along with benefits for flood control and overall watershed management and protection.

Integration/Larger Project

This project originally started out as 3 separate projects. During the IRWMP planning process, it became clear that these projects had a direct link to each other, and should be combined. These projects included:

- The Aliso Creek Mainstem Ecosystem Restoration Project (County)
- The Aliso Creek Emergency Sewer Relocation Project (SOCWA/MNWD)
- Water Harvesting on Aliso Creek (SCWD).

Goals

The Project goal is to provide stream restoration/enhancement and relocation of SOCWA/MNWD lines as outlined in the Aliso Creek Watershed Management Plan. Project objective is to return the creek to a healthy, functioning ecosystem. The project will expressly meet the goal of water supply reliability and efficiency through the capture, treatment, and use of urban runoff by eliminating non-point source contaminants and improving surface water quality. Decreased urban runoff from the creek will also promote healthy downstream ecosystem and fewer beach closure days at the Aliso Creek.

Objectives

The project proposes a multi-objective approach to Aliso Creek watershed development and enhancement, accommodating channel stabilization, flood hazard reduction, economic uses, aesthetic and recreational opportunities, and habitat concerns, all of which assist in meeting the goals of this proposal. The objectives relevant to this project include WS-1, WS-2, WS-3, WS-4, WQ-1, AE-1, AE-2, SF-1, and SF-2.

Scientific Basis

By implementing proven restoration technologies, the creek can be restored to a stable vegetated streambank sideslope of 3:1. This project was included in the Los Angeles District, U.S. Army Corps of Engineers Report in 2001, "Aliso Creek Watershed Management Study, Feasibility Study."

Metrics

Monitoring of bacteria count will be quantified. The metrics for this project include million gallons per day. This water originates in the Northern California and the Colorado River watersheds, and is transported to Southern California through a series of aqueducts. It is estimated that the proposed system would provide approximately 0.5 million gallons per day, reducing the demand for potable water by approximately 7% and significantly reducing demands on agricultural water rights.