Section 4: Water Management Strategies Used to Meet Plan Objectives

4.1 Overview

Section 3 of this IRWMP introduced the water management objectives for the Region, as identified by the Stakeholders of the Upper Santa Clara River IRWMP. This section of the IRWMP is intended to introduce the reader to water management strategies, or general means by which the broad objectives listed in Section 3 will be realized. Eventually, individual projects will be identified in Section 5, which are the specific means proposed by the Stakeholders for implementing the water management strategies identified in this section. Figure 4.1-1 graphically demonstrates the relationship between objectives, strategies, and projects.

This section introduces a diverse menu of water management strategies available to meet the water management objectives within the Region. The State of California has identified 24 different water management strategies that can be used to improve water resource management. Section 4.2 defines and discusses each of the 24 water management strategies of the *California Water Plan*, in order to provide the reader with an understanding of the State's vision for possible ways to meet future water management challenges. This section also serves to provide background in common water management tools available. In this report, we have organized the 24 different management strategies into five areas based on the objectives defined by the Stakeholders (reduce water demand, improve operational efficiency, increase water supply, improve water quality, and promote resource stewardship).

Section 4.3 demonstrates how the Stakeholders have built upon the water management strategies in the *California Water Plan* and water management strategies already implemented in the area and have tailored these strategies to meet the water management objectives of the Region. Finally, Section 4.4 describes the "Call for Projects" process and gives an overview of projects submitted for inclusion in the IRWMP which will implement these strategies to meet the regional objectives.

4.2 California Water Plan Water Management Strategies

This section describes the *California Water Plan* and each of the 24 water management strategies (referred to in the *California Water Plan* as "resource" management strategies; please see Figure 4.1-2). The *California Water Plan*, which is updated every five years as required by the California Water Code, is a resource for water planners, managers and policy-makers faced with the task of acting as stewards of this resource. More concisely, it is a strategic plan for all regions of the State that addresses the uncertainty of future water needs by recommending a diversified approach, consisting of multiple strategies and a range of short- and long-term actions. Given the many water challenges the State must actively respond to, the *California Water Plan* deems it imperative that planning take place on a regional scale and that planning constitute an inclusive process involving multiple players, particularly local agencies and governments and their citizens.

FIGURE 4.1-1
RELATIONSHIP BETWEEN OBJECTIVES, STRATEGIES, AND PROJECTS

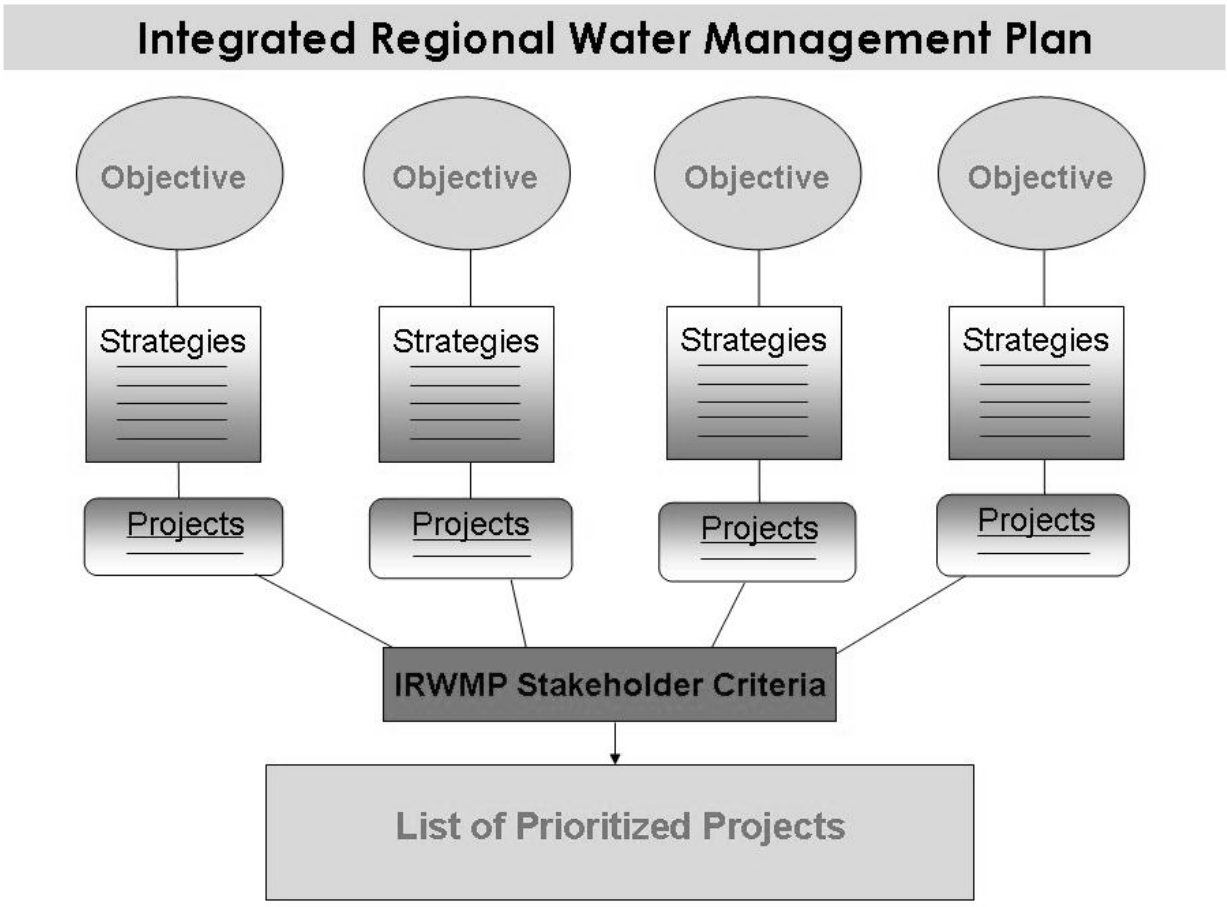
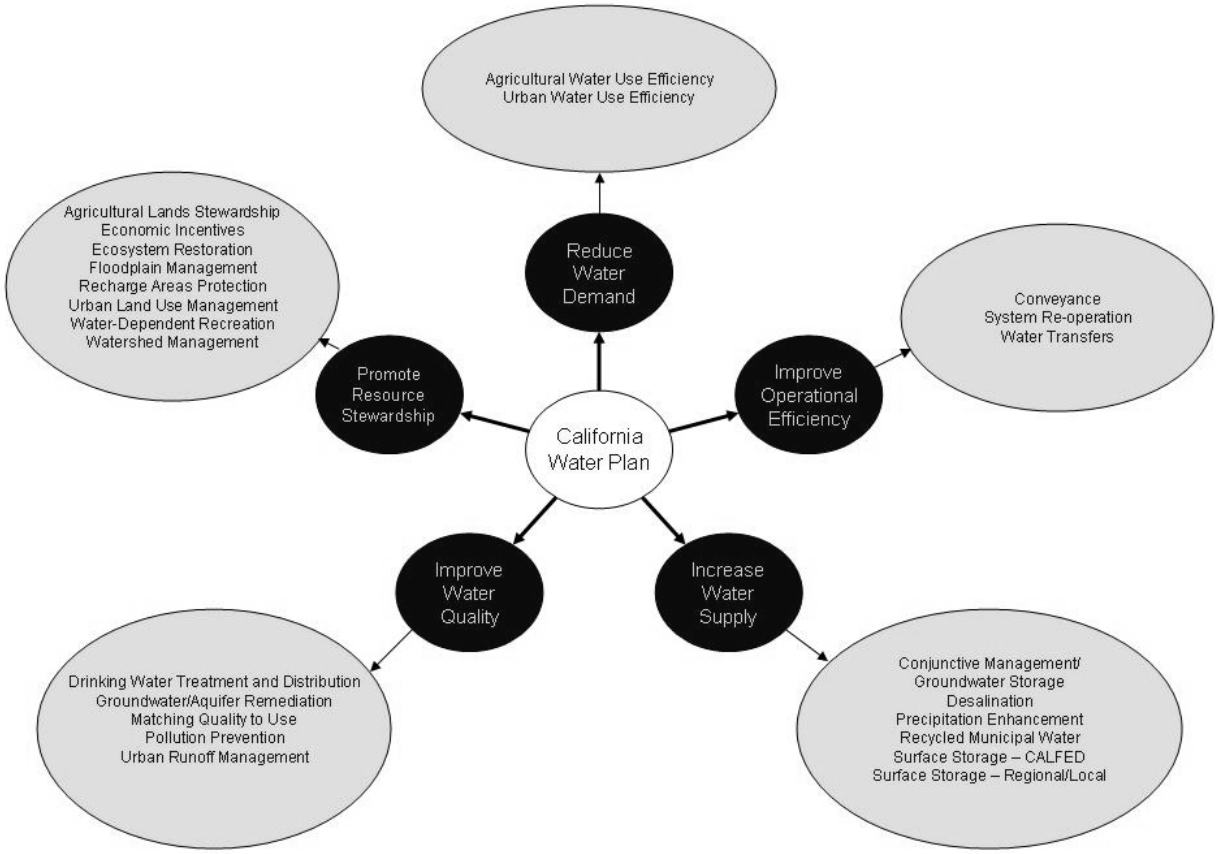


FIGURE 4.1-2
TWENTY FOUR WATER MANAGEMENT STRATEGIES OF THE CALIFORNIA WATER PLAN



The following water management strategies are projects, programs or policies that can be used to manage water and related resources in such a way that will expand local water portfolios and encourage efficient water allocation and use. The following descriptions are taken from the *California Water Plan.*

4.2.1 Reduce Water Demand

4.2.1.1 Agricultural Water Use Efficiency

Agricultural water use efficiency involves improvements in technologies and management of agricultural water that result in water supply, water quality, and environmental benefits. Efficiency improvements can include on-farm irrigation equipment, crop and farm water management, and water supplier distribution systems.

4.2.1.2 Urban Water Use Efficiency

Urban water use efficiency involves technological or behavioral improvements in indoor and outdoor residential, commercial, industrial, and institutional water use that lower demand, lower per capita water use, and result in benefits to water supply, water quality, and the environment.

4.2.2 Improve Operational Efficiency

4.2.2.1 Conveyance

Conveyance provides for the movement of water. Specific objectives of natural and managed water conveyance activities include flood management, consumptive and non-consumptive environmental uses, water quality improvement, recreation, operational flexibility, and urban and agricultural water deliveries. Infrastructure includes natural watercourses as well as constructed facilities like canals, pipelines and related structures including pumping plants, diversion structures, distribution systems, and fish screens. Groundwater aquifers are also used to convey water.

Installation of a conveyance pipeline in the City of Santa Clarita by Castaic Lake Water Agency

4.2.2.2 System Re-operation

System re-operation means changing existing operation and management procedures for such water facilities as dams and canals to meet multiple beneficial uses. System re-operation may improve the efficiency of existing uses, or it may increase the emphasis of one use over another. In some cases, physical modifications to the facilities may be needed to expand the re-operation capability.

4.2.2.3 Water Transfers

A water transfer is defined in the California Water Code as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer or exchange of water or water rights. A more general definition is that water transfers are a voluntary change in the way

water is usually distributed among water users in response to water scarcity. Transfers can be from one party with extra water in one year to another who is water-short that year.

4.2.3 Increase Water Supply

4.2.3.1 Conjunctive Management and Groundwater Storage

Conjunctive management is the coordinated operation of surface water storage and use, groundwater storage and use, and the necessary conveyance facilities. Conjunctive management allows surface water and groundwater to be managed in an efficient manner by taking advantage of the ability of surface storage to capture and temporarily store storm water and the ability of aquifers to serve as long-term storage.

4.2.3.2 Desalination – Brackish/Seawater

Desalination is a water treatment process for the removal of salt from water for beneficial use. Desalination is used on brackish (low-salinity) water as well as seawater. In California, the principal method for desalination is reverse osmosis. This process can be used to remove salt as well as specific contaminants in water such as trihalomethane precursors, volatile organic carbons, nitrates, and pathogens.

4.2.3.3 Precipitation Enhancement

Precipitation enhancement, commonly called “cloud seeding,” artificially stimulates clouds to produce more rainfall or snowfall than they would naturally. Cloud seeding injects special substances into the clouds that enable snowflakes and raindrops to form more easily.

4.2.3.4 Recycled Municipal Water

Water recycling, also known as reclamation or reuse, is an umbrella term encompassing the process of treating wastewater, storing, distributing, and using the recycled water. Recycled water is defined in the California Water Code to mean “water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.”

4.2.3.5 Surface Storage – CALFED

The CALFED *Record of Decision* (2000) identified five potential surface storage reservoirs that are being investigated by DWR, the US Bureau of Reclamation, and local water interests. Building one or more of the reservoirs would be part of CALFED’s long-term comprehensive plan to restore ecological health and improve water management of the Bay-Delta. The five (5) surface storage investigations are: Shasta Lake Water Resources Investigation, In-Delta Storage Project, Upper San Joaquin River Basin Storage Investigation, North-of-the-Delta Offstream Storage, and Los Vaqueros Reservoir Expansion.

4.2.3.6 Surface Storage – Regional/Local

Surface storage is the use of reservoirs to collect water for later release and use. Surface storage has played an important role in California where the pattern and timing of water use does not always match the natural runoff pattern. Most California water agencies rely on

surface storage as a part of their water systems. Surface reservoirs can be formed by building dams across active streams or by building off-stream reservoirs where the majority of the water is diverted into storage from a nearby water source.

4.2.4 Improve Water Quality

4.2.4.1 Drinking Water Treatment and Distribution

Drinking water treatment includes physical, biological, and chemical processes to make water suitable for potable use. Distribution includes the storage, pumping, and pipe systems to protect and deliver the water to customers.

4.2.4.2 Groundwater/Aquifer Remediation

Groundwater remediation involves extracting contaminated groundwater from the aquifer, treating it, and discharging it to a water course or using it for some purpose. It is also possible to inject the treated water back into the aquifer. Contaminated groundwater can result from a multitude of sources, both naturally occurring and anthropogenic. Examples of naturally occurring contaminants include heavy metals, high TDS, and high salinity from specific geologic formations or conditions. Groundwater can also be contaminated from anthropogenic sources with organic constituents, inorganic constituents, and radioactive constituents from many point and non-point sources. These anthropogenic sources include industrial sites, mining operations, leaking tanks and pipelines, landfills, impoundments, dairies, agricultural and storm runoff, and septic systems.

4.2.4.3 Matching Quality to Use

Matching water quality to water use is a management strategy that recognizes that not all water uses require the same quality water. One common measure of water quality is its suitability for an intended use, and a water quality constituent is often only considered a contaminant when that constituent adversely affects the intended use of the water. High quality water sources can be used for drinking and industrial purposes that benefit from higher quality water, and lesser quality water can be adequate for some uses, such as irrigation. Further, some new water supplies, such as recycled water, can be treated to a wide range of purities that can be matched to different uses.

4.2.4.4 Pollution Prevention

Pollution prevention can improve water quality for all beneficial uses by protecting water at its source, reducing the need and cost for other water management and treatment options. By preventing pollution throughout a watershed, water supplies can be used, and re-used, for a broader number and types of downstream water uses. Improving water quality by protecting source water is consistent with a watershed management approach to water resources problems.

4.2.4.5 Urban Runoff Management

Urban runoff management is a broad series of activities to manage both storm water and dry-weather runoff. Dry weather runoff occurs when, for example, excess landscape irrigation water flows to the storm drain. Urban runoff management is linked to several other resource strategies including pollution prevention, land use management, watershed management, water

use efficiency, recycled water, protecting recharge areas, and conjunctive management (combined use of surface and ground water systems to optimize resource use and minimize adverse effects of using a single source).

4.2.5 Promote Resource Stewardship

4.2.5.1 Agricultural Lands Stewardship

Agricultural lands stewardship broadly means conserving natural resources and protecting the environment by land managers whose stewardship practices conserve and improve land for food, fiber, watershed functions, soil, air, energy, plant and animal and other conservation purposes. It also protects open space and the traditional characteristics of rural communities. Further, it helps landowners maintain their farms and ranches rather than being forced to sell their land because of pressure from urban development.

4.2.5.2 Economic Incentives (Loans, Grants, Water Pricing)

Economic incentives are financial assistance and pricing policies intended to influence water management. For example, economic incentives can influence the amount of use, time of use, wastewater volume, and source of supply. Economic incentives include low-interest loans, grants, and water pricing rates. Free services, rebates, and the use of tax revenues to partially fund water services also have a direct effect on the prices paid by the water users. Governmental financial assistance can provide incentives for resource plans by regional and local agencies. Also, government financial assistance can help water agencies make subsidies available to their water users for a specific purpose.

4.2.5.3 Ecosystem Restoration

Ecosystem restoration can include changing the flows in streams and rivers, restoring fish and wildlife habitat, controlling waste discharge into streams, rivers, lakes or reservoirs, or removing barriers in streams and rivers so salmon and steelhead can spawn. Ecosystem restoration improves the condition of our modified natural landscapes and biotic communities to provide for the sustainability and for the use and enjoyment of these ecosystems by current and future generations.

Flooding in the Upper Santa Clara River Region

4.2.5.4 Floodplain Management

Floodplain management reduces risks to life and property and benefits natural resources. Floodplain management accepts periodic flooding and generally is a preferred alternative to keeping rivers in their channels and off floodplains. Seasonal inundation of floodplains provides essential habitat for hundreds of species of plants and animals, many of them dependent on periodic floods. There are also benefits to the economy, agriculture, and society to keeping rivers and their floodplains connected, including water quality improvements and groundwater recharge. Floodplain management also entails limiting the amount and type of development in a floodplain.

4.2.5.5 Recharge Areas Protection

Recharge area protection includes keeping groundwater recharge areas from being paved over or otherwise developed and guarding the recharge areas so they do not become contaminated. Protection of recharge areas, whether natural or man-made, is necessary if the quantity and quality of groundwater in the aquifer are to be maintained. Existing and potential recharge areas must be protected so that they remain functional and they are not contaminated with chemical or microbial constituents.

4.2.5.6 Urban Land Use Management

Effective urban land use management consists of planning for the housing and economic development needs of a growing population while providing for the efficient use of water and other resources. The way in which we use land – the type of use and the level of intensity – has a direct relationship to water supply and quality.

4.2.5.7 Water-Dependent Recreation

Water-dependent recreation includes a wide variety of outdoor activities that can be divided into two (2) categories. The first category includes fishing, boating, swimming, and rafting, which occur on lakes, reservoirs, and rivers. The second category includes recreation that is enhanced by water features but does not require actual use of the water, such as wildlife viewing, picnicking, camping, and hiking.

Recreation on Castaic Lake

4.2.5.8 Watershed Management

Watershed management is the process of evaluating, planning, managing, restoring, and organizing land and other resource use within an area of land that has a single common drainage point. Watershed management tries to provide sustainable human benefits, while maintaining a sustainable ecosystem. Watershed management assumes that a prerequisite for any project is the sustained ability for the watershed to maintain the functions and processes that support the native ecology of the watershed. This does not imply that a goal is to return to an undisturbed condition. Instead it implies an integration of human needs and environmental needs that allow the watershed to sustain ecological integrity over time while providing for sustainable community needs. It is recognized that watersheds are dynamic and the precise makeup of plants, animals, and other characteristics will change over time.

4.3 Water Management Strategies Adopted by Stakeholders

The following five broad categories of water management strategies are consistent with the *California Water Plan*, and were adopted by the Stakeholders in the process described in Section 3.1:

- Reduce Water Demand: Implement technological, legislative and behavioral changes that will reduce user demands for water.

- Improve Operational Efficiency: Maximize water system operational flexibility and efficiency, including energy efficiency.

- Increase Water Supply: Understand future regional demands and obtain necessary water supply sources.

- Improve Water Quality: Supply drinking water with appropriate quality; improve groundwater quality; attain water quality standards.

- Promote Resource Stewardship: Preserve and improve ecosystem health, improve flood management, preserve and enhance water dependent recreation.

As described in Section 3, a Stakeholder process was used to develop objectives for the IRWMP. The same Stakeholder process was used to develop strategies to meet the IRWMP objectives. While brainstorming issues, goals, and objectives for the Upper Santa Clara River Region, Stakeholders discussed and developed potential strategies to address these issues. A long "laundry list" of potential water management strategies was presented to the Stakeholder Group during the March 2007 Stakeholder meeting. A matrix matching strategies, objectives, and *California Water Plan* strategies was prepared for the May 2007 Stakeholder meeting and this matrix has been refined at subsequent meetings. Table 4.3-1 demonstrates the relationship of the Region's water management strategies with the *California Water Plan* strategies. Note that the table, due to its size, has been placed at the end of this section. There are several strategies in the matrix that are not described in detail herein; the list serves as a starting point for potential future strategies as this IRWMP evolves based on Stakeholder review and input. Strategies will be reviewed, enhanced, added or subtracted as the IRWMP progresses through time.

OBJECTIVES OF UPPER SANTA CLARA RIVER IRWMP

Reduce Water Demand: Implement technological, legislative and behavioral changes that will reduce user demands for water.

Improve Operational Efficiency: Maximize water system operational flexibility and efficiency, including energy efficiency.

Increase Water Supply: Understand future regional demands and obtain necessary water supply sources.

Improve Water Quality: Supply drinking water with appropriate quality; improve groundwater quality; and attain water quality standards.

Promote Resource Stewardship: Preserve and improve ecosystem health; improve flood management; and preserve and enhance water-dependent recreation.

4.3.1 Reduce Water Demand

Existing methods to reduce water demand in the Region include the various water conservation programs implemented in the Region by the retail water purveyors for both urban and agricultural users.

4.3.1.1 Agricultural Water Use Efficiency

Agricultural water use is diminishing in the Region as land uses change through time to generally more urban uses. The Region has no formal water use efficiency programs targeted specifically at agricultural users. However, certain users located within the Region have installed drip irrigation or utilize on-farm practices to maximize efficiency of water use.

4.3.1.2 Urban Water Use Efficiency

CLWA, the retail purveyors and LACWWDs are signatories to the "Memorandum of Understanding Regarding Urban Water Conservation in California" (MOU). The urban water conservation BMPs included in the MOU are intended to reduce California's long-term urban water demands. The BMPs are currently implemented by the signatories to the MOU on a voluntary basis. By signing the MOU, CLWA, LACWWDs and the purveyors became members of the California Urban Water Conservation Council (CUWCC) and report their progress on BMP implementation to the CUWCC.

LACWWDs signed on behalf of the various district service areas in 1996. CLWA signed the urban MOU in February 2001 on behalf of its wholesale service area and pledged to implement several BMPs (listed below) at a wholesale support level. NCWD signed the MOU in 2002 on behalf of its retail service area. VWC signed the MOU in 2006 on behalf of its own retail service area. CLWA and the purveyors coordinate wherever possible to maximize efficiency and ensure the cost effectiveness of their conservation programs.

Castaic Lake Water Agency's Conservatory Garden and Learning Center

In coordination with the purveyors, CLWA has been implementing the following BMPs (which pertain to wholesalers) for several years (some prior to signing the MOU in 2001):

- BMP 3: System Water Audits, Leak Detection and Repair
- BMP 7: Public Information Programs
- BMP 8: School Education Programs
- BMP 10: Wholesale Agency Programs
- BMP 11: Conservation Pricing
- BMP 12: Water Conservation Coordinator
- BMP 13: Water Waste Prohibition (implementation during last drought)

For example, as part of BMP 3, CLWA does a monthly review of metered sales within their wholesale system compared to metered supply to determine if there is any water loss within their system. Since 2001, CLWA has also instituted implementation of BMP 2 (Residential Plumbing Retrofits) and BMP 14 (Residential Ultra Low Flush Toilet Replacement Programs) on behalf of the purveyors. After signing the MOU, the purveyors have initiated implementation of the remaining BMPs that are specific to retail water suppliers:

- BMP 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers
- BMP 3: System Water Audits, Leak Detection and Repair
- BMP 4: Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections
- BMP 5: Large Landscape Conservation Programs and Incentives
- BMP 6: High-Efficiency Clothes Washing Machine Financial Incentive Programs
- BMP 9: Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts
- BMP 11: Conservation Pricing
- BMP 12: Conservation Coordinator
- BMP 13: Water waste Prohibition

Reports to the CUWCC on BMP implementation by CLWA and the purveyors were included in the 2005 UWMP. LACWWD Nos. 36 and 37 submit reports to the CUWCC separately. Additional savings are occurring Region-wide due to state interior plumbing code requirements that have been in effect since 1992, as well as due to changes in lot size and reduction in exterior square footage of new housing and commercial developments. These have begun to impact overall demand in the Region. The Region's water suppliers monitor water demand trends through time to assess those factors that are accounting for the reduction, and to attempt to quantify them.

As part of their water use efficiency programs and BMPs, many of the water agencies in the Region also have meter testing, repair, and replacement programs. Replacement of up to 2,800 outdated meters per year is included in CLWA's *Fiscal Year 2006/2007 Strategic Plan*. In addition VWC has a Meter Changeout Program. VWC tests and maintains meters as recommended by the American Water Works Association (AWWA) in the *Manual of Water Supply Practices, Water Meters – Selection, Installation, Testing, and Maintenance* (AWWA M6). VWC has determined that any meter older than 15 years in the system will be changed out on a priority basis. Approximately 1,500 meters a year are replaced in the VWC system. NCWD tests, replaces and/or repairs, as necessary, all residential and commercial meters 15 years or older. Larger landscape meters are tested on a more frequent basis, once every two years, and larger meters (3 inches or larger) are tested yearly or as needed.

Outside of the Valley, the only portion of the Region included in an urban water use efficiency program is LACWWD No. 37, by merit of LACWWDs being a signatory to the MOU.

4.3.2 Improve Operational Efficiency

A number of capital improvement projects and plans have been, and continue to be, conducted to improve operational efficiency in the Region. The major projects and plans are briefly discussed below.

4.3.2.1 Conveyance

Every three years, CLWA prepares a *Capital Improvement Plan* which outlines the necessary infrastructure improvements needed to maintain operational efficiency. These include modifications to pipelines or pump stations, as well as operations management systems (such as supervisory control and data acquisition [SCADA]). The *Capital Improvement Plan* outlines the costs for the recommended facilities.

4.3.2.2 System Re-operation

LACWWD No. 37 is currently planning a potential system modification to add the areas of Acton and Agua Dulce to its service area. This modification is discussed in the *Acton-Agua Dulce Conceptual Master Plan for Water Facilities* (2004) and is based on an assessment of current capacity and projected buildout water demands for Acton, Agua Dulce and LACWWD No. 37. The addition would improve operational efficiency in the two areas not currently being supplied. Among other infrastructure improvements, the expansion would require expansion of AVEK's treatment plant and supply pipeline and storage systems, as well as expansion of the Vincent Pump Station in LACWWD No. 37.

Water managers in the Region are constantly looking for ways to improve system operation efficiencies, with a particular emphasis on energy efficiency. Treatment plant and distribution system pumping schedules are constantly reviewed and assessed to obtain maximum operational efficiency. For example, NCWD participates in energy efficiency programs in partnership with Southern California Edison (SCE). They have conducted SCADA upgrades that allow NCWD to turn off pumps so that the pumps will not run at all times. They have made these upgrades at three locations: Four Bay Castaic, Well 12 Newhall, and Lost Canyon Booster Station Pinetree. SCE requests in advance for NCWD to cut the electricity load at least in half and NCWD responds by not operating pumps during the specified time periods. Initially, SCE estimated that this would occur up to six times a year; however, during the summer months, due to high demand for electricity, it may happen more often. SCE also tests pumps and motors for operational efficiency and if found to be inefficient, NCWD will replace the equipment and obtain a rebate from SCE. NCWD also practices time-of-day pumping in which pumping is conducted during off-peak hours. An example location where this program is conducted is within NCWD's Tesoro system. NCWDs Tesoro SCADA system is set so that the pumps fill the storage tanks only during off-peak hours.

CLWA is taking measures to increase treatment plant efficiency and reduce the waste of water. As part of the RVWTP Expansion, CLWA has proposed a new means of treating waste washwater whereby more water will be recovered and put back into the treatment process. Additionally, a pilot treatment plant is being installed that will allow the agency to model the treatment process and optimize treatment for, among other things, water efficiency and will result in improved plant performance at both the RVWTP and ESFP.

Another example is the Valencia WRP where power is generated using byproducts of the treatment process. At the Valencia WRP, a 500 kilowatt (kW) generator is driven by a reciprocating engine that runs on compressed digester gas. The electricity generated is returned to the Valencia WRP power grid, thus reducing the amount of electricity purchased for use at the WRP. In addition, the thermal energy generated by the engine is used to produce hot water, which is used to heat the WRP digesters.

4.3.3 Increase Water Supply

Several studies and assessments have been conducted in recent years in order to identify potential methods to increase water supply to the Region. A brief summary of these plans is provided below.

4.3.3.1 Conjunctive Management and Groundwater Storage

In 2003, CLWA produced a *Draft Water Supply Reliability Plan (Reliability Plan)*. The plan outlines primary elements that CLWA should include in its water supply mix to obtain maximum overall supply reliability enhancement. These elements include both conjunctive use and groundwater banking programs, as well as water acquisitions. The *Reliability Plan* also contains a recommended implementation plan and schedule.

The *Reliability Plan* recommended that CLWA obtain total water banking storage capacity of 50,000 AF, with pumpback capacity of 20,000 AFY, by 2005. For the long-term, CLWA should obtain a total of 183,000 AF of storage capacity, with total pumpback capacity of 70,000 AFY by 2050. In response to this *Reliability Plan*, CLWA has established conjunctive use management efforts through water banking and groundwater storage as discussed in Section 2.6.4. Existing water banks in which CLWA participates for the benefit of its service area include the Semitropic Water Storage District and Rosedale-Rio Bravo Water Storage District water banks.

AVEK is in the process of developing a groundwater banking program in its service area. This program has not yet been developed to a level that would provide detailed information about its capabilities or its availability to users within the Region.

4.3.3.2 Desalination

4.3.3.2.1 Groundwater/Brackish Water

The two sources of groundwater in the Region are water drawn from the Alluvial Aquifer and from the Saugus Formation. Neither of these supplies can be considered brackish in nature, and desalination is not required.

Water managers in the Region could partner with SWP contractors and provide financial assistance for the construction of regional groundwater desalination facilities, in exchange for SWP supplies. The desalinated water would be supplied to users in communities near the desalination plant, and a similar amount of SWP supplies would be exchanged and allocated to CLWA or AVEK (the two SWP contractors in the Region).

In addition, should an opportunity emerge with a local agency other than an SWP contractor, an exchange of SWP deliveries would most likely involve a third party, such as the Metropolitan Water District of Southern California (MWD). Most local groundwater desalination facilities

would be projects implemented by retailers of SWP contractors and, if an exchange program was implemented, would involve coordination and wheeling of water through the contractor's facilities to CLWA or AVEK (CLWA 2005).

4.3.3.2.2 Seawater

Because the Region is not in a coastal area, it is neither practical nor economically feasible for water managers in the Region to implement a seawater desalination program. However, similar to the brackish water and groundwater desalination opportunities described above, water managers in the Region could provide financial assistance to other SWP contractors in the construction of their seawater desalination facilities in exchange for SWP supplies.

Most of the existing and proposed seawater desalination facilities are or would be operated by agencies that are not SWP contractors. However, in these cases (as described above for groundwater/brackish water), an exchange for SWP deliveries would most likely involve a third party (SWP contractor), the local water agency constructing the desalination facility (retailer), and CLWA or AVEK (CLWA 2005). For example, the Bay Area Regional Desalination Partnership, made up of four agencies collaborating on a Regional Desalination Project in the San Francisco Bay Area, is working to develop desalination as a water supply for that region. This partnership, comprised of San Francisco Public Utilities Commission, Santa Clara Valley Water District, East Bay Municipal Utilities District, and Contra Costa Water District, is in the process of planning regional seawater/brackish water desalination facilities. CLWA could participate in this regional desalination project on an exchange basis (CLWA 2005), and would receive exchanged SWP Table A Amount from one of the partners who is an SWP contractor.

4.3.3.3 Precipitation Enhancement

At this time, no known precipitation enhancement efforts have occurred or are planned in the Region.

4.3.3.4 Recycled Municipal Water

CLWA prepared a *Draft Recycled Water Master Plan* in 2002, which updated a previous master plan completed in 1993. The 2002 *Recycled Water Master Plan* identifies the sources of recycled water in the CLWA service area, their potential constraints, and potential recycled water users. A recycled water model was prepared to size the recommended recycled water infrastructure system. Additionally, the 2002 *Recycled Water Master Plan* presents the regulatory and permitting requirements, potential funding opportunities, and an implementation plan for the proposed system. The Final EIR for the *Recycled Water Master Plan* was certified in March 2007, and the Notice of Determination was filed on March 29, 2007. To date, Phase 1A of the proposed recycled water system has been completed.

4.3.3.5 Water Transfers

As discussed in Section 2.6.5, CLWA has entered into an agreement with Buena Vista Water Storage District/Rosedale-Rio Bravo Water Storage District for a transfer of 11,000 AFY of firm water supply. The supply is based on existing long-standing Kern River water rights. This transfer is an example of a voluntary agreement among parties for an exchange of water. Some of the parties have rights to supplies in excess of their needs, and another party will be assisted in meeting its increasing demands. This transfer also allows for conjunctive use options, in that

water not needed in a given year can be banked in Rosedale-Rio Bravo Water Storage District until a later time when it may be needed. This flexibility provides several operational efficiencies as well as increasing water supply to the Region.

4.3.3.6 Surface Storage- CALFED

At this time, none of the CALFED surface storage facilities have been constructed. Two of the proposed facilities have been determined to be feasible and will be subjected to further analysis: Sites Reservoir in Glenn and Colusa Counties, and Temperance Flat Reservoir expansion in Fresno County. Future analysis would need to be undertaken to determine if the water agencies in the Region would be willing to financially participate in the construction and operations and maintenance of either of these surface storage options.

4.3.3.7 Surface Storage- Regional/Local

As part of its water supply contract with DWR, CLWA has access to a portion of the storage capacity of Castaic Lake. This Flexible Storage Account allows CLWA to utilize up to 4,684 AF of the storage in Castaic Lake. Any of this amount that CLWA borrows must be replaced by CLWA within five years of its withdrawal. CLWA manages this storage by keeping the account full in normal and wet years and then delivering that stored amount (or a portion of it) during dry periods. The account is refilled during the next year that adequate SWP supplies are available to CLWA to do so. CLWA has recently negotiated with Ventura County water agencies to obtain the use of their Flexible Storage Account. This allows CLWA access to another 1,376 AF of storage in Castaic Lake. CLWA access to this additional storage is available on a year-to-year basis for ten (10) years as of 2006. The total storage amount is 6,060 AF.

4.3.4 Improve Water Quality

4.3.4.1 Drinking Water Treatment and Distribution

CLWA recently completed a Chloramines Conversion Project. The project involved the system-wide conversion from chlorine disinfection methods to chloramines disinfection techniques. There are multiple benefits from using chloramines instead of chlorine for disinfection of water. Chloramines last longer in water, they are more effective at removing pathogens like bacteria and viruses, and they create fewer by-products (e.g., Trihalomethanes). CLWA converted to chloramines in order to meet drinking water standards as required by the US EPA. This project ensures that the higher water quality standards are met.

Castaic Lake Stores SWP Water for Treatment

CLWA operates two water treatment plants: the ESFP located in Castaic and the RVWTP located in the City of Santa Clarita. As of June 2007, an expansion of the RVWTP from 30 mgd to 60 mgd is currently underway and will be complete within a year. The RVWTP obtains its raw water supply from SWP water stored in Castaic Lake via a 201-inch diameter pipeline (the

Foothill Feeder) owned and operated by MWD, one 42-inch diameter pipeline connection to the Foothill Feeder and one 102-inch diameter pipeline (that conveys raw water to CLWA's Intake Pump Station [IPS]), and a 102-inch diameter raw water pipeline between the IPS and the RVWTP site. The increase in capacity of the RVWTP is taking place in response to current and new water quality standards, and is intended to improve reliability to meet existing customer demands and planned future demand. The 16,790 AFY of additional treated water would be able to serve approximately between 17,309 and 18,054 households, or between approximately 55,389 and 57,773 persons. Additionally, modifications to the existing ozone treatment system will be completed. As part of the expansion, a parallel connection to the existing 42-inch connection to the MWD 201-inch Foothill Feeder pipeline will be constructed (including a connection to a new MWD 48-inch valve) and modifications to the IPS to increase the capacity to 60 mgd will be completed. No new water supply is associated with this expansion (CLWA 2006).

The ESFP was expanded from 33.6 mgd to 56 mgd and the upgraded facility went online in August 2005. Originally built in 1980 and expanded in 1987, the ESFP treats SWP water transported to Castaic Lake. From there, the water is piped to the ESFP for treatment. The expansion project had several components: improvements to the existing raw water treatment system, including replacement of the existing raw water pumping plant with a 56 mgd capacity pump facility, and installation of a 54-inch bypass pipeline within the existing easement to improve the existing raw water gravity flow system; at the filtration plant, construction of a new structure containing new ozone facilities for primary disinfection and chemical system for secondary disinfection; pre-filtration improvements, including new contact clarifiers and other equipment; conversion of the filtration system to deep bed monomedium filters using anthracite filter media and related equipment upgrades; and modifications to the washwater recovery system including installations of a new treatment system within an existing structure. Some of the proposed modifications were needed to comply with changing regulations that regulate drinking water quality. The existing ESFP would have been out of compliance by 2004. Expansion of the water treatment plant provided a component of the CLWA water delivery system necessary to treat the water for a portion of planned growth in the Valley (CLWA 2002).

4.3.4.2 Groundwater/Aquifer Remediation

As discussed in Section 2.8.6, the detection of perchlorate in Valley groundwater supplies has raised concerns over the reliability of those supplies, in particular the Saugus Formation, where four wells have been removed from active service as a result of perchlorate. Planning and design for remediation of the perchlorate and restoration of the impacted well capacity are now complete. Under the current schedule for restoring contaminated water supply (wells), construction started in mid-2007 and treatment is anticipated by fall 2008. CLWA, the local retail water purveyors, DTSC, and US ACE will continue to work closely on the perchlorate contamination issue. While the remediation of the affected wells is being completed, non-impacted production facilities can be relied upon for the quantities of water projected to be available from the Alluvial Aquifer and Saugus Formation during the time necessary to restore perchlorate-impacted wells.

4.3.4.3 Matching Quality to Use

Not all water uses require the same quality of water or level of water treatment. Potable water should be reserved for those uses that require potable water standards (e.g., drinking water supplies), while other uses that do not require potable water (industrial, construction, landscape

and agricultural irrigation) can use recycled water. Various laws are in place to ensure water quality matches use, including Title 22, Chapter 4 of the California Code of Regulations (Title 22). Under Title 22, DPH has set bacteriological water quality standards on the basis of the expected degree of public contact with recycled water. Title 22 identifies several levels of recycled water based on level of treatment and disinfection, including: Disinfected Tertiary Recycled Water; Disinfected Secondary-23 Recycled Water; Disinfected Secondary-2.2 Recycled Water; and Undisinfected Secondary Recycled Water. Title 22 further identifies allowable uses for each of these different levels of recycled water based on the potential impacts to public health. Table 4.3-2 summarizes the allowable uses of water given various treatment levels.

Table 4.3-2 demonstrates that there are many potential uses for recycled water. The Saugus and Valencia WRPs provide primary, secondary and tertiary treatment. Primary treatment removes a large portion of wastewater solids using settling basins and flocculation (primary treated water is not used in California). Secondary treatment adds biological treatment and may or may not include disinfection. Tertiary treated recycled water involves coagulation, flocculation, clarification, filtration and disinfection steps. The Saugus and Valencia WRPs produce disinfected tertiary recycled water, suitable for the anticipated use of recycled water for landscape irrigation for users identified in the 2002 *Recycled Water Master Plan*.

Matching quality of water to use is not limited to recycled water. For example, water high in nitrate must be blended in order to make this water appropriate for drinking water. However, this same water, if managed properly, can be used for irrigation. Water high in nitrate is only recommended for certain types of crops and must be applied in combination with the right fertilizers. For some applications, nitrate in irrigation water reduces the need to apply fertilizers with nitrogen.

4.3.4.4 Pollution Prevention

Pollution prevention acts to limit discharges to water that negatively affect beneficial uses. The Los Angeles RWQCB seeks to avoid pollution by regulating discharges from various land uses, industrial uses, septic systems, leaking underground storage tanks, and by controlling dredging. Improving water quality/pollution prevention assists other water management strategies such as “Promote Resource Stewardship.”

Valencia Water Company Water Softening Demonstration Project

TABLE 4.3-2
ALLOWED USES OF RECYCLED WATER

Potential Use	Treatment Level: Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water
Use of Recycled Water for Irrigation				
Food crops where recycled water contacts the edible portion of the crop, including all root crops.	Allowed	Not allowed	Not allowed	Not allowed
Parks and playgrounds.	Allowed	Not allowed	Not allowed	Not allowed
School yards.	Allowed	Not allowed	Not allowed	Not allowed
Residential landscaping.	Allowed	Not allowed	Not allowed	Not allowed
Unrestricted access golf courses.	Allowed	Not allowed	Not allowed	Not allowed
Food crops where edible portion is produced above ground and not contacted by recycled water.	Allowed	Allowed	Not allowed	Not allowed
Cemeteries.	Allowed	Allowed	Allowed	Not allowed
Freeway landscaping.	Allowed	Allowed	Allowed	Not allowed
Restricted access golf courses.	Allowed	Allowed	Allowed	Not allowed
Ornamental nursery stock and sod farms.	Allowed	Allowed	Allowed	Not allowed
Use of Recycled Water for Irrigation				
Pasture for milk animals.	Allowed	Allowed	Allowed	Not allowed
Nonedible vegetation with access control to prevent use as a park, playground or school yard.	Allowed	Allowed	Allowed	Not allowed
Orchards with no contact between edible portion and recycled water.	Allowed	Allowed	Allowed	Allowed
Vineyards with no contact between edible portion and recycled water.	Allowed	Allowed	Allowed	Allowed
Non food-bearing trees, including Christmas trees not irrigated less than 14 days before harvest.	Allowed	Allowed	Allowed	Allowed
Fodder crops (e.g. alfalfa) and fiber crops (e.g. cotton).	Allowed	Allowed	Allowed	Allowed
Seed crops not eaten by humans.	Allowed	Allowed	Allowed	Allowed
Food crops that undergo commercial pathogen-destroying processing before consumption by humans.	Allowed	Allowed	Allowed	Allowed

Potential Use	Treatment Level: Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water
Ornamental nursery stock, sod farms not irrigated less than 14 days before harvest.	Allowed	Allowed	Allowed	Allowed
Use of Recycled Water for Impoundments				
Non-restricted recreational impoundments, with supplemental monitoring.	Allowed[a]	Not allowed	Not allowed	Not allowed
Restricted recreational impoundments and publicly accessible fish hatcheries.	Allowed	Allowed	Not allowed	Not allowed
Landscape impoundments without decorative fountains.	Allowed	Allowed	Allowed	Not allowed
Use of Recycled Water for Cooling				
Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or spraying that creates a mist.	Allowed[b]	Not allowed	Not allowed	Not allowed
Industrial or commercial cooling or air conditioning not involving a cooling tower, evaporative condenser, or spraying that creates a mist.	Allowed	Allowed	Allowed	Not allowed
Use of Recycled Water for Other Purposes				
Groundwater recharge	Allowed under special case-by-case permits by RWQCBs[c]	Groundwater recharge	Allowed under special case-by-case permits by RWQCBs[c]	Groundwater recharge
Flushing toilets and urinals	Allowed	Flushing toilets and urinals	Allowed	Flushing toilets and urinals
Priming drain traps	Allowed	Priming drain traps	Allowed	Priming drain traps
Industrial process water that may contact workers	Allowed	Industrial process water that may contact workers	Allowed	Industrial process water that may contact workers
Structural fire fighting	Allowed	Structural fire fighting	Allowed	Structural fire fighting
Decorative fountains	Allowed	Decorative fountains	Allowed	Decorative fountains
Use of Recycled Water for Other Purposes				
Commercial laundries	Allowed	Not allowed	Not allowed	Not allowed
Consolidation of backfill material around potable water pipelines.	Allowed	Not allowed	Not allowed	Not allowed

Potential Use	Treatment Level: Disinfected Tertiary Recycled Water	Disinfected Secondary-2.2 Recycled Water	Disinfected Secondary-23 Recycled Water	Undisinfected Secondary Recycled Water
Artificial snow making for commercial outdoor uses.	Allowed	Not allowed	Not allowed	Not allowed
Commercial car washes not done by hand & excluding the general public from washing process.	Allowed	Not allowed	Not allowed	Not allowed
Industrial boiler feed.	Allowed	Allowed	Allowed	Not allowed
Nonstructural fire fighting.	Allowed	Allowed	Allowed	Not allowed
Backfill consolidation around nonpotable piping.	Allowed	Allowed	Allowed	Not allowed
Soil compaction.	Allowed	Allowed	Allowed	Not allowed
Mixing concrete.	Allowed	Allowed	Allowed	Not allowed
Dust control on roads and streets.	Allowed	Allowed	Allowed	Not allowed
Cleaning roads, sidewalks and outdoor work areas.	Allowed	Allowed	Allowed	Not allowed
Flushing sanitary sewers.	Allowed	Allowed	Allowed	Allowed

Source*:* California Health Laws Related to Recycled Water, "The Purple Book" *Excerpts from the Health and Safety Code, Water Code, and Titles 22 and 17 of the California Code of Regulations. Last Update: June 2001*

Notes:

(a) With "conventional tertiary treatment." Additional monitoring for two years or more is necessary with direct filtration.

(b) Drift Eliminators and/or biocides are required if public or employees can be exposed to mist.

(c) Refer to Groundwater Recharge Guidelines, California Department of Health Services.

One program used by the Los Angeles RWQCB is the TMDL program. The Region currently has two TMDLs adopted by the Los Angeles RWQCB, one for nitrogen compounds (Reaches 7 and 8) and one for chlorides (Reaches 5 and 6). Table 4.3-3 identifies and describes the geographic locations of the reaches of the Upper Santa Clara River that lie within the Region as identified in the adopted Basin Plan (see also Figure 2.1-1).

TABLE 4.3-3
UPPER SANTA CLARA RIVER REACHES

Reach Number	Reach Name	Geographic Description
5 (part of Reach 5 is outside the Region, in Ventura County)	Blue Cut	Upstream of USGS Blue Cut Gauging Station to the West Pier Highway 99/Old Road Bridge
6	Highway 99	Upstream of Highway 99 to Bouquet Canyon Bridge
7	Bouquet Canyon	Upstream of Bouquet Canyon to Lang Gauging Station
8	Above Lang Gauging Station	Lang Gauging Station to headwaters

The nitrogen compounds TMDL was established due to the listing of various reaches of the Santa Clara River for Nitrate + Nitrite on the 303(d) list of impaired water bodies in 1998. The source analysis for the nitrogen compound TMDL found discharge of reclaimed water to be one

of the sources of nitrogen compounds in the river, along with agricultural runoff, storm water runoff, and groundwater discharge. Given these sources, wasteload allocations for nitrogen compounds were assigned to the various sources. The nitrogen compounds TMDL was included as a Los Angeles RWQCB *Basin Plan Amendment* in August 2003.

The chloride TMDL was established due to the listing of Reaches 5 and 6 of the Upper Santa Clara River for chloride on the 303(d) list of impaired water bodies in 1998. The chloride TMDL includes a number of special studies to provide scientific certainty over the appropriate wasteload allocations and objectives for chloride that are necessary to protect various beneficial uses, including salt-sensitive agriculture and endangered species.

4.3.4.5 Urban Runoff Management

The US EPA approved the SWRCB and nine RWQCBs for enforcement of the storm water regulations identified in the Clean Water Act. The SWRCB elected to issue one statewide General Construction Activity Storm Water Permit (General Permit) which applies to all construction activity (except those areas on Indian lands and the Lake Tahoe Hydrologic Unit). In the Region, the Los Angeles RWQCB enforces storm water regulations.

The General Permit requires the development and implementation of Storm Water Pollution Prevention Plans (SWPPP) emphasizing storm water BMPs. All dischargers must prepare, retain at the construction site, and implement a SWPPP. The SWPPP has two major objectives:

- To help identify the sources of sediment and other pollutants that affect the quality of storm water discharges.
- To describe and ensure the implementation of practices to reduce sediment and other pollutants in storm water discharges.

The SWPPP should include the following information:

- Site description addressing the elements and characteristics specific to the site
- Descriptions of BMPs for erosion and sediment controls
- BMPs for construction waste handling and disposal
- Implementation of approved local plans
- Proposed post-construction controls, including description of local post-construction erosion and sediment control requirements
- Non-storm water management

Prior to issuing a grading or building permit, the City of Santa Clarita requires that each entity applying for such demonstrate compliance with the General Construction Activity Storm Water Permit (where applicable) or by implementation of alternative grading and construction activity run-off control programs. In addition to regulating storm water runoff, the City of Santa Clarita regulates pollutants from industrial activities. The City of Santa Clarita requires that entities

engaged in industrial activities and subject to the General Industrial Activities Storm Water Permit demonstrate compliance with that permit prior to making any discharges to the sewer system. Owners of parking lots associated with industrial or commercial activities and with more than twenty-five parking spaces exposed to storm water are required to implement BMPs to reduce the discharge of pollutants. These requirements are a part of the City of Santa Clarita's role as a permitee under the Los Angeles County Municipal Storm Water National Pollutant Discharge Elimination System Permit (NPDES No. CAS004001) issued by the Los Angeles RWQCB. As a permitee, the City of Santa Clarita also has outreach and education efforts related to urban runoff, performs inspections for proper application of BMPs at industrial, commercial, and construction sites, performs street sweeping, maintains catch basins, and provides trash collection.

The City of Santa Clarita is one of 84 cities along with the LACFCD (the primary permitee) that are covered by the County Municipal Storm Water NPDES. The objective of this permit is to protect the beneficial uses of receiving waters in the County. To meet this objective, the permit requires that BMPs will be implemented to reduce the discharge of pollutants in storm water to the maximum extent practicable. Permitees are required to implement BMPs related to:

- Public Information and Participation Programs.
- Industrial/Commercial Facilities Control Program.
- Development Planning Program (Program to limit post-construction runoff from developments).
- Development Construction Program (program to limit runoff from construction activities).
- Public Agency Activities Program (program to limit storm water pollutant impacts from public agency activities).
- Illicit Connections and Illicit Discharges Elimination Program (program to prevent unauthorized discharges to the sewer system).

4.3.5 Promote Resource Stewardship

Existing practices employed in the Region as part of ongoing resource stewardship efforts include the following broad-based land use, watershed and floodplain management activities, policies and programs implemented by various entities in the Region for both urban and agricultural users.

Aerial View of the Upper Santa Clara River Watershed

Efforts include, but are not limited to: land use management plan development; land and habitat conservation plan development; land use designation for conservation; land acquisition for conservation; impact mitigation plan development; endangered species recovery plan development; restoration and enhancement plan development; Sensitive Resource Area designation; SEA planning (County); and the

work of private resources, conservation organizations, tasks forces, and concerned citizen groups, as summarized below (VCWPD and LACDPW 2005).

4.3.5.1 Agricultural Lands Stewardship

Agricultural lands stewardship is a critical component of planning for resource conservation and water use efficiency. Approximately 38,400 acres in the Upper Santa Clara River Watershed are zoned agricultural. Several well-established incentive programs to support agricultural land preservation are implemented throughout the Region. A Williamson Act Contract, prepared pursuant to the California Land Conservation Act of 1965, provides an approximately 25 to 75 percent property tax break to private landowners in exchange for a voluntary agreement to maintain ongoing agricultural use for a rolling 10-year period. The contract automatically renews at the end of 10 years unless a notice of non-renewal is filed prior.

Numerous federal programs administered by the Natural Resource Conservation Service (NRCS) provide support for protecting water resources and natural habitats while preserving agricultural and grazing lands. These Farm Bill programs, resulting from passage of the Farm Security and Rural Investment Act of 2002 and renewal of funding for its key conservation programs in 2007, provide farmers and ranchers incentives such as cost-share, land rentals, incentive payments, and technical assistance, to respond to the range of emerging natural resource challenges related to the management of their lands.

Local land use planning also serves as an important venue to promote agricultural land stewardship. Updates and modifications to policies further supporting and protecting existing and future agricultural use from urban encroachment and conversion are under consideration as part of the Los Angeles *Countywide General Plan* update and the Valley's *OVOV Area Plan* update. National and regional non-profit organizations are also involved in implementing resource conservation strategies that focus on agricultural land management. The Nature Conservancy provides one example. Currently, The Nature Conservancy is exploring possibilities to implement a program designed to encourage ecologically compatible and economically viable local farming operations to act as a buffer zone between the river and developed areas.

4.3.5.2 Economic Incentives

Economic incentives to promote resource stewardship include the provision of grants and other forms of financial assistance to land owners, water purveyors, and wastewater agencies, bonding and tax policies, as well as the implementation of pricing to promote efficient water use. Land acquisition for the purpose of protection and restoration of significant ecological areas is another important strategy that utilizes the financial market to help achieve stewardship goals.

In addition to the incentive programs discussed under the agricultural land stewardship section, other voluntary restoration programs offer financial incentives to landowners. US FWS "Partners for Fish & Wildlife" Program is one such program offered in the Region. The Partners for Fish & Wildlife Program provides funds and technical assistance to landowners, and supports the restoration and enhancement of wetlands, native grasslands, and other declining habitats, for the benefit of threatened and endangered species, migratory birds, and other wildlife. Supported regional activities include the removal of invasive non-native plants, such as arundo, and reintroduction of native plant species to riparian areas. Large land acquisition efforts are also underway by the Coastal Conservancy and The Nature Conservancy for

watercourse expansion, flood management activities, and the protection and restoration of habitat and wildlife corridors along the Upper Santa Clara River.

4.3.5.3 Ecosystem Restoration

Ecosystem restoration refers to the restoration of natural areas that have been altered as a result of anthropogenic pressures such as agriculture, urban development and pollution. In many ways, the purpose of ecosystem restoration is not only to improve the intrinsic value of the lands themselves, but to strengthen their ability to provide important ecosystem services such as groundwater recharge and flood protection.

Various restoration efforts are underway throughout the Region. The Nature Conservancy is facilitating restoration of southern steelhead habitat along the Santa Clara River through a variety of measures, including planting vegetation filter strips along urban and agricultural interfaces to filter contaminants, planting native vegetation along riverbanks to lessen erosion and to reduce sediment loading, and conducting exotic plant removal and native vegetation restoration pilot projects. The Nature Conservancy has acquired 40 acres in the Upper Santa Clara River Watershed with immediate plans to acquire an additional 350 acres (3 parcels total) in the floodplain (personal communication, EJ Remson 2007). In addition, the Sierra Club's Santa Clara River Greenway Campaign is underway to bring the entire 500-year floodplain of the Santa Clara River from the City of Fillmore to the community of Acton into public ownership and protection for improved water quality and quantity, enhancement of plant and wildlife species habitats, protection of open space attributes and aesthetics, increased river fluvial dynamics, and maintenance of agricultural resources.

The Friends of the Santa Clara River (Friends) is another non-profit conservation group with a focus on the protection, preservation and enhancement of the Region's riparian and watershed-dependent resources. In the Upper Santa Clara River Watershed, Friends works with The Nature Conservancy and Southcoast Wildlands on some of their acquisition efforts in the Soledad Canyon area. They also have a stream team that samples the river water once a month at two Upper Santa Clara River sites.

Other restoration efforts underway include implementation of the *ARCO Oil Spill Restoration Plan*, developed by the US FWS and the CDFG's Office of Spill Prevention and Response. This restoration plan resulted from an oil spill settlement that stipulated funds be used for habitat rehabilitation, re-vegetation and/or protection of areas within the Santa Clara River Watershed, and for wildlife projects that benefit endangered species.

In July 2007, voters in the City of Santa Clarita voted to form an open space preservation district. The annual cost to single family homeowners will be $25; condominium and townhouse owners will pay slightly less and those who own larger, non residential parcels will pay more. In future years, fees for the open space preservation district can increase by no more than $1 per year and only if approved by the City Council, following a public hearing. The open space preservation district is intended to purchase lands in and around the City and finish the City's greenbelt buffer (City of Santa Clarita 2007).

4.3.5.4 Floodplain Management

The floodplain is the low land adjacent to a natural watercourse which is subject to inundation during a given flood event. In terms of hydrology, the floodplain may be defined as the water

level attained in some particular stage of the river (VCWPD and LACDPW 2005). Floodplain management is an important component of comprehensive land use management, and has the potential to provide numerous benefits, including flood protection from property damage and loss of life, habitat for riverine and riparian species, water quality improvements, and groundwater recharge. The LACFCD is currently implementing many flood management programs throughout the Region.

As described in Section 2, the river is highly variable, with low flows for several years, followed by a period of high flows. In that portion where the river is in the Angeles National Forest/Soledad Canyon, the river is well defined and there are no flood control structures. Further downstream, within the City of Santa Clarita, a 2-mile reach of the river has been modified with rip-rap, soil cement, and concrete banks for flood control purposes.

4.3.5.5 Recharge Areas Protection

The availability of local groundwater supplies is derived in part from the sustainability of the groundwater resource, or its ability to recharge. Groundwater resources rely heavily on groundwater recharge areas such as natural drainage channels, floodways and floodplains that help to replenish underlying aquifers. Identification and management of recharge areas is one of 14 elements comprising CLWA's 2003 *Groundwater Management Plan*. Such activities are critical to ensuring that the Valley groundwater basin continues to readily recharge, as historical operating experience demonstrates it has in the past.

The Los Angeles RWQCB is charged with the responsibility of developing solutions which will restore water quality and protect beneficial water uses, including groundwater recharge. The Los Angeles RWQCB's implementation of pollution prevention programs such as the federal Nonpoint Source Pollution Program, and participation in the US EPA's Brownfields Cleanup and Redevelopment Agency Program, are significant components of recharge area protection. Regional arundo removal efforts and the removal of other invasive, water-intensive plants also contribute to the protection of groundwater recharge areas.

A significant improvement to recharge area protection in the Valley will be provided by the remediation of the former Whittaker-Bermite site, which contains soils contaminated with perchlorate and other contaminants.

4.3.5.6 Urban Land Use Management

Urban land use decisions generally occur at the local level, but these decisions can impact the ecological health of regional systems, including the hydrologic cycle and local water quality and supply. General plans throughout the Upper Santa Clara River Watershed are therefore important policy tools that can guide land use decision-making to simultaneously protect the community's economic interests and public and environmental health needs. The City of Santa Clarita's general planning process includes strategic planning efforts for land use and resource conservation. The Los Angeles *Countywide General Plan* and the *Santa Clarita Valley Area Plan (OVOV)* are currently undergoing update processes. As part of the OVOV process the City of Santa Clarita and the County are currently in the process of creating a single general plan for the Valley and its communities. In addition to policies established by local land use plans, existing local policies and ordinances will be further strengthened as part of ongoing efforts to encourage and, in some cases, mandate low impact development adjacent to affected waterways in the Region. For example, development setbacks and landscape guidelines for

fuel management zones are established by the applicable land use jurisdiction for new development adjacent to or within the immediate vicinity of a water body, and the identification and implementation of sensitive biological resource areas overlay zones are under consideration, such as the one described below.

Los Angeles County Department of Regional Planning has proposed (but not yet adopted) the creation of a SEA that encompasses the entire County reach of the Santa Clara River and that includes existing SEA Nos. 19, 23, and 61. The proposed SEA meets several designation criteria and supports the protection and preservation of many regional biological resources, including habitat for core populations of endangered species, migration corridors, diverse and abundant plant and wildlife species assemblages, regionally distinct biotic communities, and areas that have high value for preservation because they represent relatively undisturbed examples of natural biotic communities in the Region. Management recommendations for the proposed SEA include limiting new developments to outside the existing floodplain margins to obviate the necessity for further bank stabilization, stringent review of proposals for new or increased groundwater extraction to prevent overdrafting of the shallow aquifer supporting riparian habitat areas, and requiring agricultural activities to employ BMPs to avoid unnecessary impacts to habitats. This range of proposed management strategies above represents the variety of resource stewardship approaches discussed so far.

The Newhall Land and Farming Company (NLF) is currently planning for the development of Newhall Ranch, a new community that will be located on NLF land west of the Interstate-5 freeway. The site is comprised of 12,000 acres, of which approximately half will be developed and half will be preserved as open space. NLF will be required to get approvals from the US ACE, the CDFG, US FWS, and the County, which will seek to balance development with environmental protection.

4.3.5.7 Water-Dependent Recreation

Water-dependent recreation includes activities such as boating and fishing, which occur on lakes, reservoirs and rivers, and passive recreation such as camping and hiking that is enhanced by water features. Multiple lakes within the Upper Santa Clara River Watershed provide recreational opportunities of the first type to Region residents and seasonal visitors. Castaic Lake State Recreation Area, owned by DWR and managed by Los Angeles County Department of Parks and Recreation, offers boating, swimming and fishing opportunities. For anglers, Castaic Lake is known primarily for its largemouth bass fishing, but the lake also hosts a variety of additional game fish including trout and striped bass. Castaic Lake hosts team bass tournaments in the summer. Fall through spring, CDFG stocks Castaic Lake Lagoon with rainbow trout; Bouquet Creek, a tributary of the Santa Clara River, is stocked late spring through summer. In addition to fishing, Castaic Lake offers boating, waterskiing and jet skiing opportunities in approved areas.

The *Parks and Recreation Element* of City of Santa Clarita's *General Plan* has established the goal of utilizing the Santa Clara River as a central corridor for recreation. Policies proposed to achieve this goal included establishing the Santa Clara River as a major recreational focal point within the Valley, in part

City of Santa Clarita Equestrian and Bike Trail

through the development of a regional plan for the Santa Clara River. Because of the ephemeral nature of the river, water-dependent recreation in the Upper Watershed is severely limited and, throughout much of the year, non-existent. However, the County's backbone trail system runs along the river, improving river access and providing trails for walking, hiking and equestrian uses. The City of Santa Clarita has constructed a bike path system along major portions of the river and its tributaries within its jurisdictional limits. In addition, the City of Santa Clarita has plans for additional trails. See Figure 4.3-1 for a map of existing and proposed trails in the City of Santa Clarita. Given the ephemeral nature of the Upper Santa Clara River, these activities are enhanced by the presence of water on a seasonal basis.

4.3.5.8 Watershed Management

Watershed management is a holistic and politically inclusive approach to protecting water and other natural resources that focuses on land use and development within the boundaries of an identified watershed. Following a *Reconnaissance Phase Study* initiated in March 2002, the Los Angeles District of the US ACE determined that a Santa Clara River Watershed feasibility study was merited. This effort would cover the whole Watershed, and would assess the predevelopment conditions of the Watershed, the current condition, and future condition scenarios. The effort will involve extensive modeling of the Watershed, and will be designed as a tool for decision makers. For example, the study will include a comprehensive update of hydrologic, hydraulic, and sediment (yield and transport) models for a range of flow rates for existing conditions and future conditions within the Santa Clara River. The study will include generating new cross section data from new topographic maps for specific areas with existing urbanization and areas with the potential of urbanization in the near future within the Santa Clara River Watershed. One outcome of the study will be computer models that can simulate the existing and future land use changes upstream and provide data to forecast changes to the flood flows (10-, 20-, 100-year floods) and low flows (daily, 1-year, 2-year flows) in the Santa Clara River. However, due to a lack of funding, the Santa Clara River Watershed feasibility study is behind schedule. The study could be completed in early 2010.

4.4 Call for Projects

Projects are the specific means for implementing strategies and the way objectives are ultimately achieved. To identify the many potential projects in the Region and to assess the collective contribution of these projects towards meeting the IRWMP objectives, development of this IRWMP included a "Call for Projects" which gave stakeholders the opportunity to directly submit their projects and project concepts for consideration. Stakeholders were encouraged to submit projects at any stage of development. Avenues available for participating in the Call for Projects included the submission of projects on a standard project information form, either submitted by electronic mail, by facsimile, or directly on-line via the IRWMP website (www.scrwaterplan.org).

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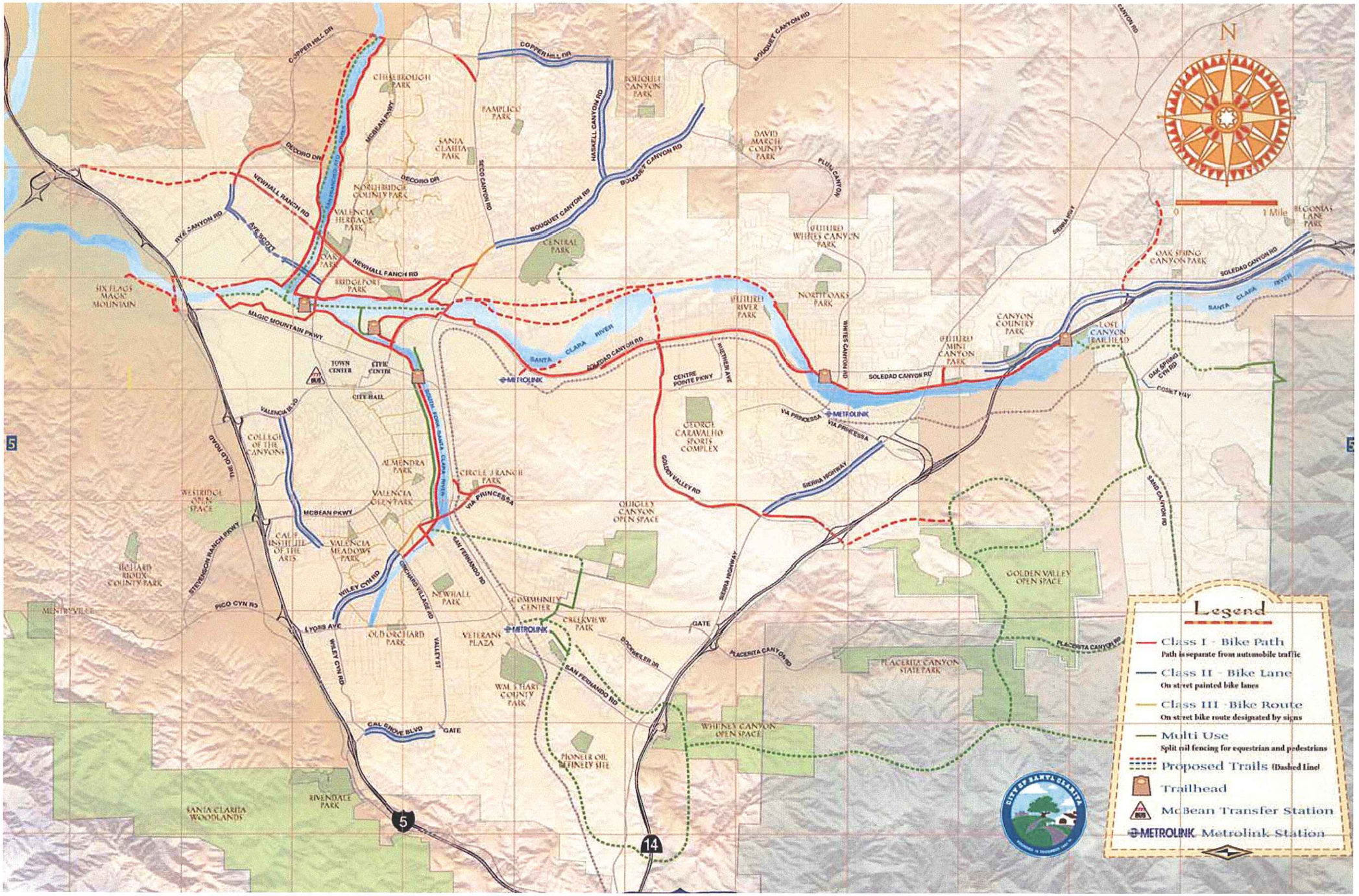

Figure 4.3-1
Upper Santa Clara River IRWMP
City of Santa Clarita Trail System

While many of the projects lack detailed supporting information, the Call for Projects provided a mechanism to engage Stakeholders in the process of sharing project information and discussing the issues related to the integration of projects. Many of the projects discussed in this section provide multiple benefits, spanning more than one strategy. Therefore, some assumptions were made with regard to which water management strategy a particular project would most benefit, to begin the initial organization of the projects. For example, a groundwater recharge project generally was assumed to provide water supply benefits, with a possible secondary benefit of addressing water quality needs. Section 5 will address this issue further by examining in greater detail how these projects can be integrated to provide multiple benefits.

The information provided herein represents the outcome of the initial step in a process of bringing individual projects into the collaborative process implied by this IRWMP. New projects are likely to be added to the database through time, and it is expected that Stakeholders will revise and update information on projects submitted.

Appendix C, Part 3, demonstrates the relationship between the projects received as part of the Call for Projects and the 24 *California Water Plan* water management strategies. In Appendix C, the projects are organized by project proponent (e.g., project sponsored by CLWA are given the names CLWA-1, CLWA-2, etc.).

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TABLE 4.3-1
UPPER SANTA CLARA RIVER REGION WATER MANAGEMENT STRATEGIES AND CALIFORNIA WATER PLAN RESOURCE MANAGEMENT STRATEGIES

	California Water Plan Strategies																								
	Agricultural Water Use Efficiency	Urban Water Use Efficiency	Conveyance	System Reoperation	Water Transfers	Conjunctive Management and Groundwater Storage	Desalination	Precipitation Enhancement	Recycled Municipal Water	Surface Storage – CALFED	Surface storage – Regional/Local	Drinking Water Treatment and Distribution	GW/Aquifer Remediation	Matching Water Quality to Water Use	Pollution Prevention	Urban Runoff Management	Agricultural Lands Stewardship	Economic Incentives	Ecosystem Restoration	Floodplain Management	Recharge Areas Protection	Urban Land Use Management	Water-Dependent Recreation	Watershed Management
REDUCE WATER DEMAND																									
Urban Water Use Efficiency Measures																									
BMP 1: Residential Survey Programs																									
BMP 2: Residential Plumbing Retrofit																									
BMP 3: System Water Audits																									
BMP 4: Metering w/Commodity Rates																									
BMP 5 Large Landscape Conservation																									
BMP 6: High Efficiency Clothes Washers																									
BMP 7: Public Information Program		•				•						•				•		•			•				
BMP 8: School Education Programs																									
BMP 9: Commercial Industrial Institutional																									
BMP 10: Wholesaler Agency Assistance Programs																									
BMP 11: Conservation Pricing																									
BMP 12: Conservation Coordinator																									
BMP 13: Water Waste Prohibitions																									
BMP 14: Residential Ultra-Low Flush Toilet Replacement Program																									
Agricultural Water-Use Efficiency Measures	•					•											•	•			•				
IMPROVE OPERATIONAL EFFICIENCY																									
Rehabilitation, Replacement, or Removal of Existing Facilities	•	•	•	•																					
Improved Operational Efficiency Measures	•	•																							
Intertie Projects			•	•	•																				
INCREASE WATER SUPPLY																									
Surface Reservoir or Storage Tank										•	•														
Surface Water Diversion				•																					
Groundwater Extraction Facilities						•																			
Aquifer Storage and Recovery						•							•												
Groundwater Management and Planning Policies						•							•		•						•				•
Groundwater Replenishment Including Spreading Grounds and Injection Wells Aquifer Recharge with Reclaimed Water Aquifer Recharge with Septic						•			•				•								•		•		•
Hydrologic Modeling and Monitoring			•	•						•	•					•				•					

TABLE 4.3-1
UPPER SANTA CLARA RIVER REGION WATER MANAGEMENT STRATEGIES AND CALIFORNIA WATER PLAN RESOURCE MANAGEMENT STRATEGIES (CONT.)

	California Water Plan Strategies																								
	Agricultural Water Use Efficiency	Urban Water Use Efficiency	Conveyance	System Reoperation	Water Transfers	Conjunctive Management and Groundwater Storage	Desalination	Precipitation Enhancement	Recycled Municipal Water	Surface Storage – CALFED	Surface Storage – Regional/Local	Drinking Water Treatment and Distribution	GW/Aquifer Remediation	Matching Water Quality to Water Use	Pollution Prevention	Urban Runoff Management	Agricultural Lands Stewardship	Economic Incentives	Ecosystem Restoration	Floodplain Management	Recharge Areas Protection	Urban Land Use Management	Water-Dependent Recreation	Watershed Management
Recycled Water for Irrigation or Other Beneficial Uses Surplus Recycled Water from Other Regions									•					•										
Increased Uses for Recycled Water through Policy Change and Education									•					•										
Imported Water	•	•	•	•	•	•				•	•	•												•
Watershed Planning																	•					•		•
Rainwater Collection Systems (Cisterns)		•				•										•								
Greywater Systems		•							•															
Water Banking, Exchange and Transfer Projects			•	•	•	•																		
Drought Contingency and Emergency Planning	•	•	•	•	•	•					•	•	•											•
Urban Water Management Planning		•																				•		
Removal of Invasive, Water-Thirsty Plants																			•	•	•			•
Understand Total Water Usage in Region	•	•				•															•			•
IMPROVE WATER QUALITY																								
Build Sewer Treatment Collection and Distribution Systems															•						•	•		
Rehabilitate or Upgrade Sewer Treatment Collection and Discharge Systems															•						•	•		
Relocate and Protect Sewer Treatment Collection and Discharge Systems - Remove from Vulnerable Locations															•						•	•		
TMDL Development and Implementation															•	•		•					•	
Pump and Treat Water for Quality Enhancement															•			•					•	
Remove or Prohibit On-Site Water Softening Devices															•									
Replacement of Problematic Septic Tank Systems with Sewer Hook-Ups															•						•	•		
Fertilizer, Herbicide, and Pesticide Application Reduction	•														•		•							
Low Level Storm Water Treatment															•	•				•				
Non-Point Source Pollution Control Landscape/Hardscape Retrofits															•	•						•		
Water Quality Monitoring (Requires Coordination Among Sampling Entities to be Effective)														•	•									•
Improve Water Quality Being Discharged									•			•		•	•	•					•	•		•
Brownfields Remediation													•	•	•	•		•			•	•		•

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Wellhead Recharge and Protection													•								•			
Emerging Contaminant Problems - Monitoring and Management									•			•	•	•	•	•								
Control and/or Enforce Prohibitions on Illegal Discharge of Controlled or Toxic Substances															•	•								
Leaking Underground Storage Tank Remediation						•							•		•									
Outreach and Education															•									
Biological Treatment of Water (e.g., Treatment Via Wetlands)																			•	•				
Improve Riparian Habitat																			•					
PRACTICE RESOURCE STEWARDSHIP																								
Levee Construction																				•				
Channel Improvement Projects																				•				
Detention Basins																				•				
Debris Basins																				•				
Ongoing Facility Maintenance																				•				
Removal of Hazards or Facilities from Floodways																				•				
Storm Monitoring and Modeling - Flows, Water Quality																				•				
Coordinated Hydrogeomorphic Modeling																			•	•	•			
Incentives for Landowners - Public/Private Partnerships																		•	•	•				•
Evaluate Process for Reconstruction Following Emergencies (Floods, Landslides)																								
Public Information Programs Regarding Flood Prevention																				•				
Land Acquisition for Watercourse Expansion/Flood Management																		•		•				
Protect And Enhance Native Ecosystem Diversity																			•					
Control, Remove, and Prevent Invasive Species																			•					
Protect Existing Habitats from Degradation																			•					
Urban Stream Restoration and Revitalization																			•	•		•		
Land Acquisition and/or Easements for Protection and Restoration of Habitat Areas Landscape Linkages/Wildlife Movement																		•	•					

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Protect and Restore Fish and Wildlife Migration Corridors and Landscape Linkages; Where Necessary Create Or Modify Structures to Facilitate Fish and Wildlife Movement, such as Fish Ladders, Road Undercrossings, etc.																			•					
Restore Natural Hydrograph and Sediment Transport in Local Watercourses																			•					
Mitigation Banking																			•					
Integrated Watershed GIS "Spatial Database"																								•
Identify and Collect Biological Resources Data for Comprehensive Database: 1) Ecosystem Function Analysis 2) Water Quantity and Quality Needs of Fish and Wildlife																			•					•
Provide for Long-Term Stewardship of Natural Resources, Especially Public Land: Staff, Funding, Organizational Structure (District or Conservancy) Monitoring and Enforcement																			•					•
Conservation Plans: 1) Evaluate Multiple Scale Habitat Needs of Aquatic and Riparian Dependent Species																			•					•
Active and Passive Recreation Areas Related to Water Resources																			•				•	
Enhance Appropriate Public Access																			•	•	•	•	•	•
Updates and Modifications to General Plan Policies																	•		•			•		
Watercourse Set-Back Ordinances or Policies																			•					•
Riparian Corridor Buffers																			•					
Floodplain Development Restrictions																				•				
Sensitive Biological Areas Overlay Zones																			•					
Flood Hazard Mapping																				•				
Require Evaluation of Footprint Impacts in Newly Developing Areas																			•					
Create Incentives (Tax Credits) for Landowners to Protect and Restore Habitats and Ecosystems on Their Property																		•	•					
Agricultural Lands Stewardship																	•							
Post-Fire Rehabilitation															•	•								
Landscape Guidelines for Fuel Modification/Defensible Space in New Development																						•		
Urban Landscape Management Planning																						•		