Yucaipa Valley Water District

12770 Second Street, Yucaipa, California 92399

2010 Urban Water Management Plan

Draft Document

Table of Contents

List of Tables

List of Figures

Section 1

Preparation of the 2010 Urban Water Management Plan

1.1 Purpose of an Urban Water Management Plan

An Urban Water Management Plan (UWMP) is prepared by a water purveyor to ensure the appropriate level of reliability in water service is sufficient to meet the needs of its various categories of customers over a 20-year planning horizon during normal, dry, and multiple dry years.

The California Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6: Urban Water Management Planning, Sections 10610 to 10656 is attached as Appendix A) is based upon the following declarations as set forth by the California Legislature:

(1) The waters of the state are limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service is sufficient to meet the needs of its various categories of customers during normal, dry and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water sources.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

In addition, the Water Conservation Bill of 2009 requires urban water suppliers to report baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use. Changes to California law require that, beginning in 2016, water suppliers comply with water conservation requirements established by the Water Conservation Bill of 2009 in order to be eligible for State water grants and loans.

The Yucaipa Valley Water District's 2010 Urban Water Management Plan has been prepared in compliance with the requirements of the California Urban Water Management Planning Act and the Water Conservation Bill of 2009.

1.2 Urban Water Management Plan Update Preparation

On July 16, 2007, the Yucaipa Valley Water District received notification from the Department of Water Resources that the 2005 Urban Water Management Plan was complete. This Plan is an update of the previously approved Plan with additional documentation required by the Department of Water Resources.

The 2010 Plan describes and evaluates the District's water supply sources, the efficient uses of that water supply, demand management measures with an implementation strategy and schedule, and other relevant information and programs. The 2010 UWMP is organized as follows:

- **Section 1 - Preparation of the 2010 Urban Water Management Plan -** This section describes the coordination between various agencies, as well as the adoption, submittal and implementation of the Plan.
- **Section 2 - Overview of the Yucaipa Valley Water District -** This section describes the service area and the population of the District.
- **Section 3 - Water System Demands -** This section provides baselines and targets for the District and water demand projections.
- **Section 4 - Water Sources and Supplies -** This section includes a description of water sources, groundwater, imported water, recycled water and water transfer opportunities
- **Section 5 - Water Supply Reliability Planning and Water Shortage Contingency Plan -** This section describes the steps the District has taken to provide a long-term, robust and reliable water supply for our customers.
- **Section 6 - Water Demand Management Measures -** This section provides a comprehensive description of the water conservation programs that are currently implemented and those that are planned to be implemented.
- **Section 7 - Climate Change -** This section provides information about potential climate change impacts on water supplies.

Specific information required by the California Urban Water Management Planning Act is cited in the Plan in italic font at the start of each relevant section. Following the reference citation, the text of the Plan responding to those requirements is provided.

1.3 Urban Water Management Plan Coordination

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable (California Water Code Section 10620(d)(2)).

The Yucaipa Valley Water District actively participated in the preparation of the Regional Urban Water Management Plans by our water wholesale agencies - the San Gorgonio Pass Water Agency and the San Bernardino Valley Municipal Water District.

Additionally, the Yucaipa Valley Water District had an opportunity to review other local Urban Water Management Plans as part of the preparation of the regional planning documents and the District also hosted a review meeting with other local water retailers.

Table 1-1 - Coordination with Appropriate Agencies

Coordinating Agencies	Participated in preparing the UWMP	Was sent a copy of the draft UWMP	Commented on the draft UWMP	Attended public meetings	Was sent a notice of intention to adopt	Was sent a final copy of the UWMP
San Bernardino Valley Municipal Water District	X	X				
San Gorgonio Pass Water Agency	X	X				
Beaumont-Cherry Valley Water District		X				
East Valley Water District		X				
South Mesa Water Company		X				
Western Heights Water Company		X				
City of Banning		X				
City of Beaumont		X				
City of Calimesa		X				
City of Redlands		X				
City of San Bernardino		X				
City of Yucaipa		X				
California Regional Water Quality Control Board, Santa Ana Region		X				
California Department of Public Health		X				
County of Riverside		X				
County of San Bernardino		X				

Table 1-1 - Coordination with Appropriate Agencies

Coordinating Agencies	Participated in preparing the UWMP	Was sent a copy of the draft UWMP	Commented on the draft UWMP	Attended public meetings	Was sent a notice of intention to adopt	Was sent a final copy of the UWMP
Riverside Local Agency Formation Commission (LAFCO)		X				
San Bernardino Local Agency Formation Commission (LAFCO)		X				
Yucaipa-Calimesa Joint Unified School District		X				
Crafton Hills College		X				
Inland Empire Resource Conservation District		X				
United States Forest Service		X				

> *Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision (California Water Code Section 10621(b)).*

On February 10th, 2011, the District sent notices to the agencies listed above.

> *The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within it provides water supplies no later than 60 days after the submission of its urban water management plan (California Water Code Section 10635(b)).*

Following the final preparation of the Plan, the District will be sending copies of the final plan to the following entities:

- City of Calimesa
- City of Yucaipa
- County of Riverside
- County of San Bernardino

> *Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan (California Water Code Section 10642).*

As provided in Table 1-1 above, the Yucaipa Valley Water District has reached out to other groups within our service area to ensure our Plan is complete and consistent with available information. These additional groups include:

- Crafton Hills College
- Yucaipa - Calimesa Joint Unified School District

- Inland Empire Resource Conservation District
- United States Forest Service

Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area (California Water Code Section 10642).

The District has made data and portions of the Plan available to the imported water wholesale agencies -- the San Gorgonio Pass Water Agency and the San Bernardino Valley Municipal Water District to maximize our coordination. Prior to adoption of the Plan, the document was available on the District website (www.yvwd.dst.ca.us) and at the District office. A copy of the public notice is defined below.

NOTICE OF PUBLIC HEARING
YUCAIPA VALLEY WATER DISTRICT
2010 URBAN WATER MANAGEMENT PLAN AND THE
2010 SAN BERNARDINO VALLEY REGIONAL URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that on June 15th, 2011 at 6:00 p.m., in the meeting room of the Board of Directors of the Yucaipa Valley Water District at 12770 Second Street, Yucaipa, California 92399, the Board of Directors will conduct a public hearing pursuant to California Water Code sections 10642 and 10608.26 to consider and receive comments and input on the *2010 Yucaipa Valley Water District Urban Water Management Plan and the 2010 San Bernardino Valley Regional Urban Water Management Plan*, to allow community input regarding the Yucaipa Valley Water District implementation plan for complying with Part 2.55 of the Water Code, to consider the potential economic impacts of the implementation plan, and to adopt a method pursuant to Water Code section 10608.20(b) for determining the Yucaipa Valley Water District's urban water use targets.

A copy of the *Draft 2010 Yucaipa Valley Water District Urban Water Management Plan* is currently available for public review. The *San Bernardino Valley Regional Urban Water Management Plan* will be available for public review on or before June 1, 2011. Both documents will be available Monday through Friday, during normal business hours at the Yucaipa Valley Water District's Administrative Office located at 12770 Second Street, Yucaipa, California 92399. In addition, an electronic version of the *Draft Yucaipa Valley Water District Urban Water Management Plan and the San Bernardino Valley Regional Urban Water Management Plan* will be accessible at the District website at www.yvwd.dst.ca.us. In summary, the *2010 Yucaipa Valley Water District Urban Water Management Plan and 2010 San Bernardino Valley*

Regional Urban Water Management Plan has been developed for implementation in accordance with the requirements of the California Urban Water Management Planning Act, Water Code sections 10610 through 10657, and the Water Conservation Act of 2009, Water Code sections 10608 through 10608.64. Public input from diverse social, cultural and economic elements of the population is encouraged and will be considered as part of the urban water management planning process. Input from and coordination with the Counties of San Bernardino and Riverside, cities within which the Yucaipa Valley Water District provides water supplies and other public agencies is also encouraged and will be considered. (Water Code §§ 10620(d)(2); 10621(b); 10642.) Any written comments regarding the *Draft 2010 Yucaipa Valley Water District Urban Water Management Plan and the 2010 San Bernardino Valley Regional Urban Water Management Plan* should be submitted by the close of business on June 8th, 2011 to the address set forth above, attention Jennifer Ares. Public comments can also be made at the public hearing at the time and place first set forth above. Upon conclusion of the public hearing, the Board of Directors of the Yucaipa Valley Water District may revise, change, modify, and/or adopt the *2010 Yucaipa Valley Water District Urban Water Management Plan and the San Bernardino Valley Regional Urban Water Management Plan.* Questions regarding the public hearing or the 2010 Urban Water Management Plan's should be directed to Jennifer Ares at (909)-790-3301. If you are disabled in any way and need accommodation to participate in the public hearing, please call Chelsie Fogus at (909)-797-5118 for assistance at least two working days prior to the hearing so the necessary arrangements can be made.

1.4 Urban Water Management Plan Adoption, Submittal and Implementation

The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with California Water Code Section 10640) (California Water Code Section 10621(c)).

Following the adoption of the Plan, if there are changes needed, the District will be conducting another public hearing to provide an opportunity for additional input from our stakeholders.

After the hearing, the plan shall be adopted as prepared or as modified after the hearing (California Water Code Section 10642) and an urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan (California Water Code Section 10643).

The District has adopted this Urban Water Management Plan as Resolution No. _____. A copy of this resolution is included as Appendix E. The implementation of this Plan will be largely dependent on growth estimates, water supply assumptions and water demand projections. While the variability of these factors, and others, will make this Plan a "living document" reflecting economic issues, political changes and societal pressures, the District intends to follow the implementation planning within this document at the time of its preparation.

An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies

> *a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption (California Water Code Section 10644(a)).*

Within 30 days after the adoption of this Plan, the District will submit copies to the following agencies:

- California Department of Water Resources;
- California State Library;
- City of Calimesa;
- City of Yucaipa;
- County of Riverside; and the
- County of San Bernardino.

> *Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours. (California Water Code Section 10645).*

Following the adoption of the Plan, the District will make a copy of the Urban Water Management Plan available for review on our website and at the District office.

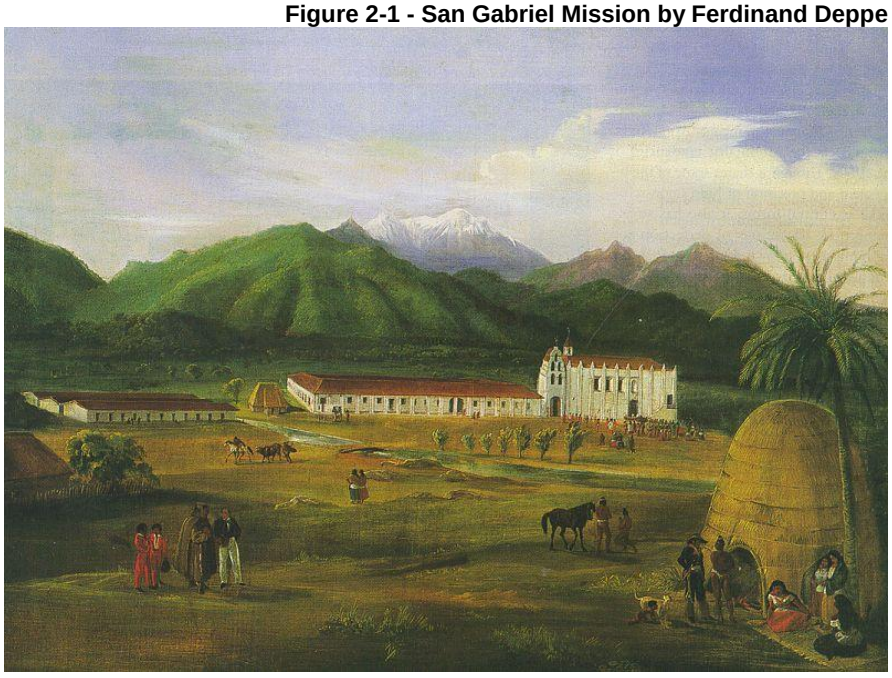
Section 2

Overview of the Yucaipa Valley Water District

2.1 A Brief History of the Yucaipa Valley

At the time of the earliest European contact, the Yucaipa Valley was inhabited by a tribe of Indians called "Serrano" ("mountaineer") by the Spaniards who first encountered them in the 18th century. This is not the name the Indians held for themselves; their precise name is not known, due to the many translations that exist today. Yucaipaiem, Yucaipe, and Yucaipat are among the names associated with the tribe. All of these names refer to "wet lands" which suitably characterized the Yucaipa Valley at the time. An abundance of water from higher elevations contributed to many natural streams and springs, combined with a mild climate and ample food resources, endowed the Yucaipa Valley with the elements necessary for the survival of this nomadic tribe.

Figure 2-1 - San Gabriel Mission by Ferdinand Deppe



With the establishment of the San Gabriel Mission (located in Los Angeles) in 1771, European settlement of the area began. In 1819, the San Bernardino de Sena Estancia was constructed as the influence of the Spanish missions moved inland towards the Yucaipa Valley. Spanish missionaries introduced the principle of irrigation with the first irrigation ditch -- the Mill Creek Zanja -- built in 1819 by the Indians. This water improvement allowed for increased farming and cattle raising in the area and opened the way for increased settlements.

The Mission period ended with the Act of Secularization in 1833, which began the Rancho period and involved the granting of large tracts of land to Mexican officials in exchange for services rendered during the Mexican revolution. This initiated a period of the Ranchos, during which time grazing and agricultural development continued to grow. Irrigation efforts also expanded, bringing water from Yucaipa's year-round streams and springs to drier sites in the vicinity.

Yucaipa's agricultural period continued to expand and thrive through its transition from Mexican to American ownership. By the twentieth century, farming interests included the cultivation of

peaches, plums, and other orchard fruits. Water pipelines transported water from Potato Canyon (in the Oak Glen area) to what is now western Yucaipa.

As development in Yucaipa, Redlands and surrounding communities expanded, the provision of water became a more critical issue. Disagreements began to occur, concerning the exportation of water from the area. This issue erupted into a lawsuit in 1909, the outcome of which had two effects: (1) Redlands' South Mountain Water Company was limited to the amount of water it could extract from Potato Canyon; and (2) the Yucaipa Land and Water Company conceded to Redlands limited rights to extract water from certain sites in Yucaipa. At this time, approximately 95% of the area's water supply was used for irrigation purposes.

Other actions in the early 1900s included the formation of several mutual water companies, some still in operation today. By the 1950s, post-World War II development pressures brought increased urbanization to the Yucaipa area. Agricultural production decreased from the farming and ranching activities of the prior decades.

From the 1960s to the present urbanization trends have increased throughout the San Bernardino and Riverside areas, earning the nickname "Inland Empire" for the entire region. Yucaipa, as part of the Inland Empire, has historically experienced similar growth pressures. However, limited water supplies and water quality regulations imposed on the septic systems in the 1980s by the Santa Ana Regional Water Quality Control Board significantly reduced the growth of the Yucaipa Valley as compared to other Inland Empire communities.

Documents cited and additional resources to explore:

- *Yucaipa Valley, California: a saga of ordinary people with extra-ordinary dreams, Morse G. Archer, 1976.*
- *Between the Coast and the Desert, Archaeological Data Recovery at the Yukaipa't Site, CA-SBR-1000, Yucaipa, California, Donn R. Grenda, 1998.*

2.2 The Formation of the Yucaipa Valley Water District

While the Yucaipa Valley Water District has a long lineage and history of water operations in the Yucaipa Valley, the Yucaipa Valley Water District was formed as part of a reorganization, pursuant to the Reorganization Act of 1965, being Division I of Title 6 of the Government Code of the State of California. This reorganization consisted of the dissolution of the Calimesa Water Company and formation of Improvement District No. 1 of the District as successor-in-interest thereto, and the dissolution of Improvement District “A” of the San Bernardino Valley Municipal Water District and the formation of Improvement District “A” of the District as successor-in-interest thereto. On September 14, 1971, the Secretary of State of the State of California certified and declared the formation of the District.

The District operates under the County Water District Law, being Division 12 of the State of California Water Code. Although the immediate function of the District at the time was to provide water service, the Yucaipa Valley Water District currently provides a variety of services to residential, commercial and industrial customers. These services include:

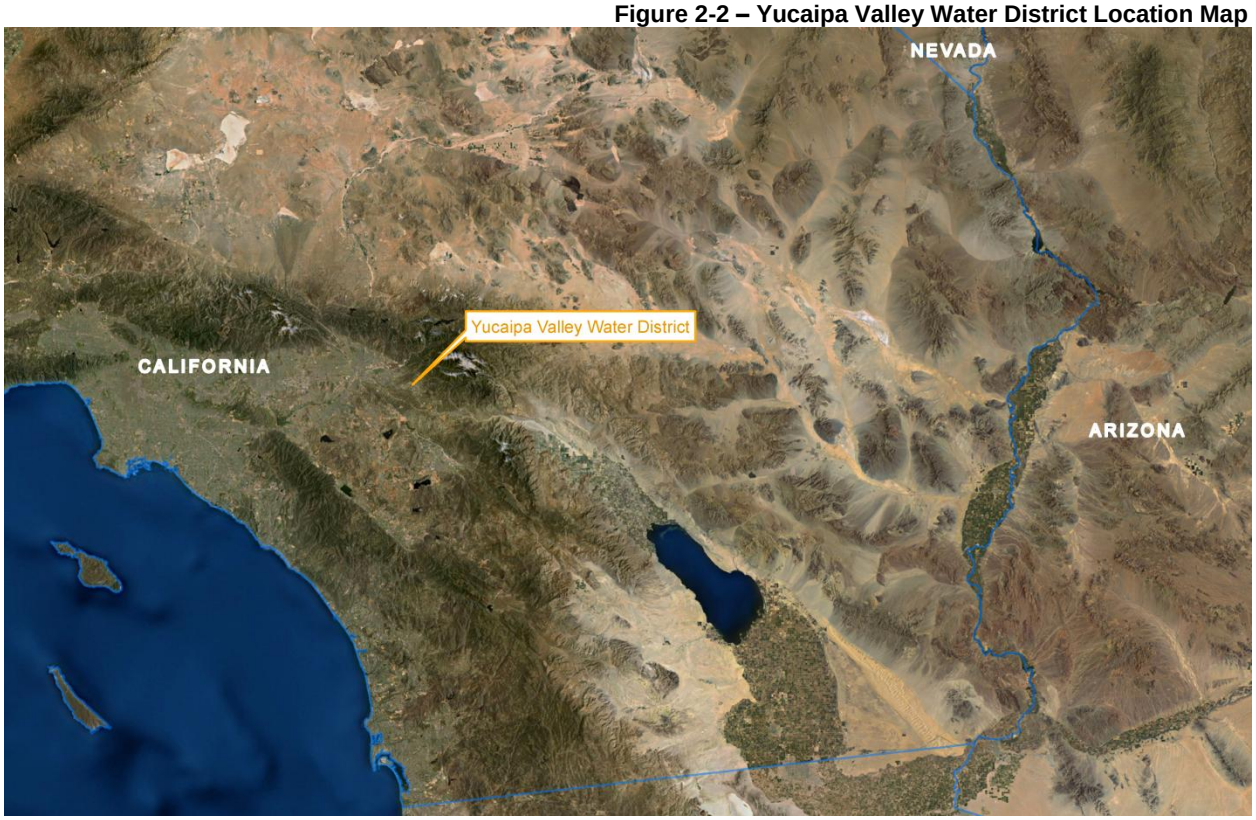
- Potable Water Service;
- Drinking Water Treatment;
- Recycled Water Service;
- Sewer Collection;
- Sewer Treatment; and
- Salinity Elimination.

2.3 The Yucaipa Valley Water District Service Area

Describe the service area of the supplier (California Water Code Section 10631(a)).

As shown below in Figure 2-2, Yucaipa Valley Water District is located in the upper portion of the Santa Ana Watershed approximately 40 miles west of Palm Springs, 70 miles east of Los Angeles, and 120 miles north of San Diego.

Figure 2-2 – Yucaipa Valley Water District Location Map



The Yucaipa Valley Water District is located in a high elevation valley at the base of the San Bernardino Mountain Range. The District's primary service area ranges in elevation from a low elevation of 2,044 feet above sea level to a high elevation of 5,184 feet above sea level. The range in elevation of 3,140 feet within the District's service area requires the District to provide water service from 18 separate pressure zones.

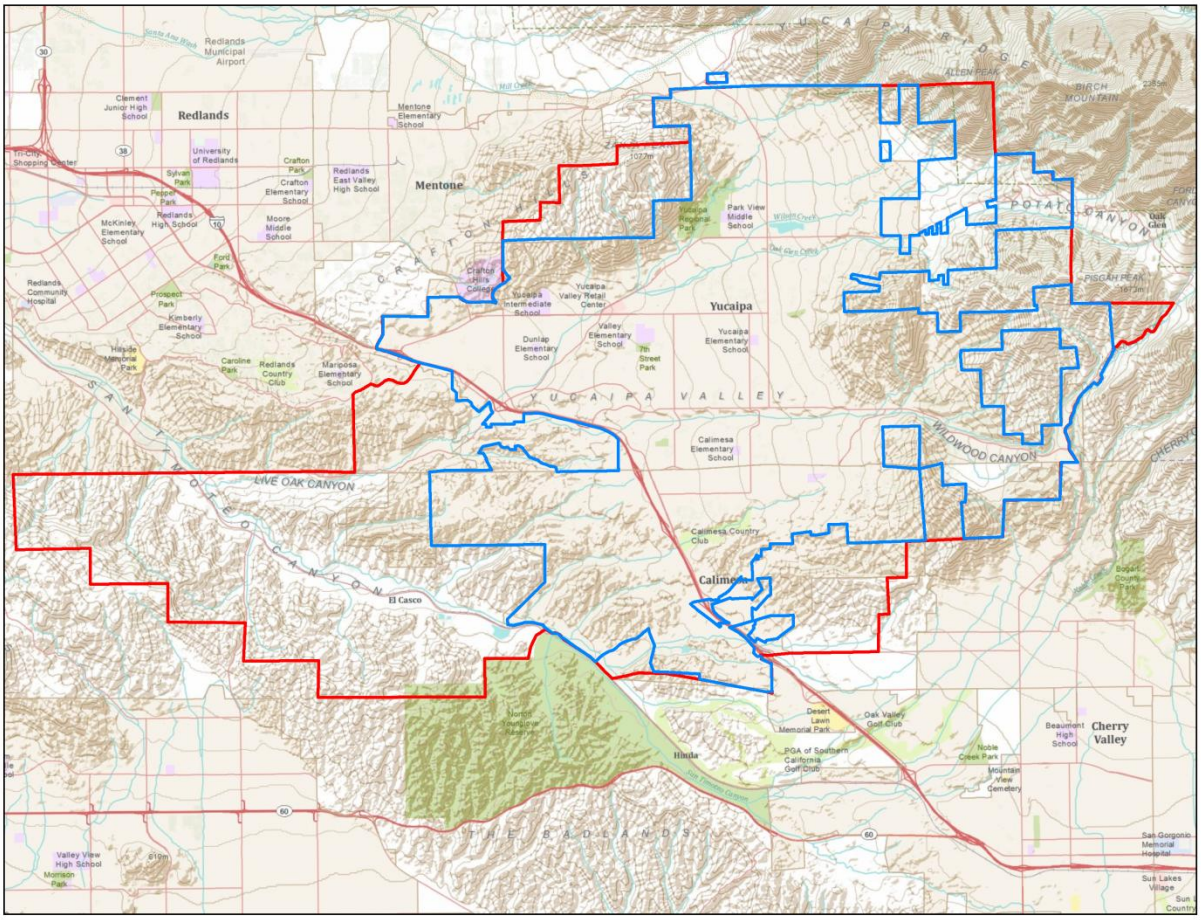
However, the future service area of the Yucaipa Valley Water District is more accurately depicted by the District's sphere of influence which ranges in elevation from 1,555 feet above sea level to 5,455 feet above sea level. This elevation difference of 3,900 feet produces a wide variety of climatic differences and various natural life zones throughout the area.

Table 2-1 Boundary Summary for Yucaipa Valley Water District

	Yucaipa Valley Water District Boundary Comparison	
	Sphere of Influence	Service Area
Minimum Elevation	1,555 feet above sea level	2,044 feet above sea level
Maximum Elevation	5,455 feet above sea level	5,184 feet above sea level
Elevation Range	3,900 feet	3,140 feet
Land Area	68 square miles (43,525 acres)	40 square miles (25,742 acres)

The District serves the residents of the City of Calimesa and the City of Yucaipa. Neighboring cities include the City of Redlands and the City of Beaumont.

Figure 2-3 – Yucaipa Valley Water District Service Area Boundary and Sphere of Influence Boundary



The diagram above illustrates the difference between the Yucaipa Valley Water District's current service area boundary (blue) and the current sphere of influence boundary (red). For the purpose of this report, the projected water demands and supply sources will be based on the sphere of influence as provided above (red boundary). This boundary most appropriately represents the ultimate planning area of the Yucaipa Valley Water District.

2.3.1 Drainage Patterns within the Yucaipa Valley Water District

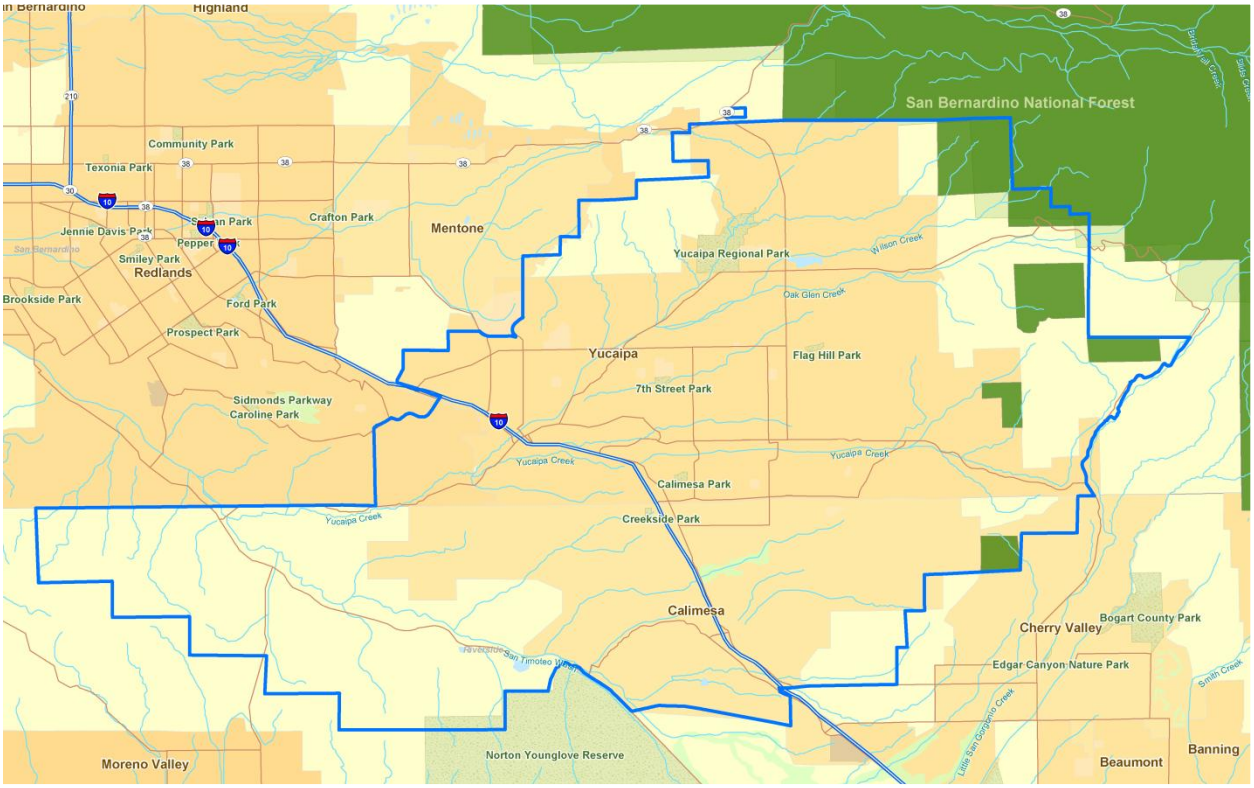
The watershed of the Yucaipa Valley extends from the crest of the Crafton Hills in the northwest, to the crest of the Yucaipa Ridge of the San Bernardino Mountains to the northeast, and the Yucaipa Hills in the southeast to the Badlands of San Timoteo Canyon to the southwest. Drainage in the area is by many small ephemeral creeks including: Yucaipa Creek, Oak Glen Creek, Wilson Creek, Birch Creek, and San Timoteo Creek. These creeks all begin in the upland areas to the northeast and drain down to the southwest through Live Oak Canyon to San Timoteo Creek which is a tributary of the Santa Ana River.

Stream gauge data and observations by District staff reveal that the creeks are generally dry during most of the year except along their upland reaches where small, sustained year-round flows may occur. Irregular flows do occur occasionally along the entire reach of the creeks during both high intensity summer cloudbursts and long duration seasonal winter storms. In both cases, the stream flows generated from these conditions tend to be very flashy, with water levels changing rapidly over time and large amounts of unconsolidated sediments being scoured from the upper reaches and washed downstream. The largest volume of these flow events occur during the winter storm season from November through April.

The surface area within the Yucaipa Valley Water District drains to San Timoteo Creek in the lower southwest portion of the District planning area. Figure 2-3 shows the major drainage courses within the planning area as identified in the General Plan of the City of Yucaipa and the City of Calimesa.

The main tributaries in the sphere of influence of the Yucaipa Valley Water District are considered relatively small by comparison to the Santa Ana River and Mill Creek directly to the north of the District. Drainage courses in the boundary of the Yucaipa Valley Water District include Wilson Creek, Oak Glen Creek, Yucaipa Creek, and San Timoteo Wash.

Figure 2-4 - Drainage Areas within the Yucaipa Valley Water District Service Area



2.3.2 Hydrogeology of the Yucaipa Valley

The Yucaipa Valley is a sediment-filled depression created by differential uplift and erosion of crystalline rock masses along complex fault traces. The basin is one of several which are located within a wedge shaped portion of the earth's crust called the San Bernardino Valley block, which is bounded by two major northwest trending faults, the San Andreas and the San Jacinto. This area is located within the Transverse Range Physiographic Province of California and is bordered on the east by the San Bernardino Mountains.

The geological structure of the area includes the essentially non-water-bearing crystalline basement rock, which underlies and surrounds the basin, and three unconsolidated units of water-bearing sediments comprising the groundwater basin; the San Timoteo Formation, the Older Alluvium, and the Younger Holocene Alluvium.

The geology of the Yucaipa Valley provides structural control of the groundwater flow in the area. Most of the structural groundwater control is provided by the San Andreas and Banning faults. These faults form the northern and southern boundaries of the groundwater basin, respectively, by way of their effectiveness as barriers to uniform groundwater flow.

The San Andreas Fault lies within a pronounced trough along the western margin of the San Bernardino Mountains. Movement along it is both right lateral and down to the south, with vertical displacements on the order of at least 300 feet being observed in drilled wells. This strike slip fault defines the northern boundary of the groundwater basin where it creates a fault contact between crystalline basement rock to the north and unconsolidated sediments to the south. This contact consists of a zone of clay materials and sheared rock, which impedes the flow of groundwater across it.

The Banning fault enters the area approximately one mile south of Interstate 10 near Live Oak Canyon and transverses easterly through the community of Calimesa. It forms the southern boundary of the groundwater basin. Primary movement along the fault has been right lateral slip, although vertical displacements of up to 250 feet on the south side have been noted in drilled holes to the east.

Between the major bounding fault systems are several minor inter-basin faults and inferred barriers. Most of these features are aligned along the northeasterly line and formed in response to differential movements along the San Andreas and Banning faults. These include the Chicken Hill fault, Yucaipa barrier, Casa Blanca barrier and Gateway barrier. In addition to these are the Oak Glen fault and South Mesa barrier which are aligned in a northwesterly direction.

Due to the complex array of faults and barriers within the Yucaipa Valley, the area has been primarily characterized into seven subbasins, which are:

- Triple Falls Creek;
- Oak Glen;
- Gateway;
- Crafton;
- Wilson Creek;
- Western Heights; and
- Calimesa.

The geology of the Yucaipa Valley is extremely complex, yet well documented. The following geologic map of the Yucaipa 7.5' quadrangle (version 1.0) dated 2003 illustrates the complexity of the area situated within a right-step-over zone between the San Jacinto and San Andreas Fault zones. The USGS describes the quadrangle as being traversed by several faults of the San Andreas system, including (from oldest to youngest) the Banning Fault and the Wilson Creek, Mission Creek, Mill Creek, and San Bernardino Strands of the San Andreas Fault.[1]

The USGS identifies the complications within the San Andreas Fault system over the last several hundred thousand years have created a landscape setting in which Quaternary surficial materials of the Yucaipa quadrangle have accumulated. Crustal extension throughout the San Bernardino Basin region led to uplift of the Crafton Hills block and down-dropping of the Yucaipa Valley region on faults of the Crafton Hills and Chicken Hill complex. Subsequent middle and late Quaternary stream flows deposited several generations of axial-valley and alluvial-fan sediment in the down-dropped lowlands. These deposits and the older San Timoteo beds they overlie record the history of Quaternary fault movements, and form reservoirs for ground water in the Yucaipa quadrangle.

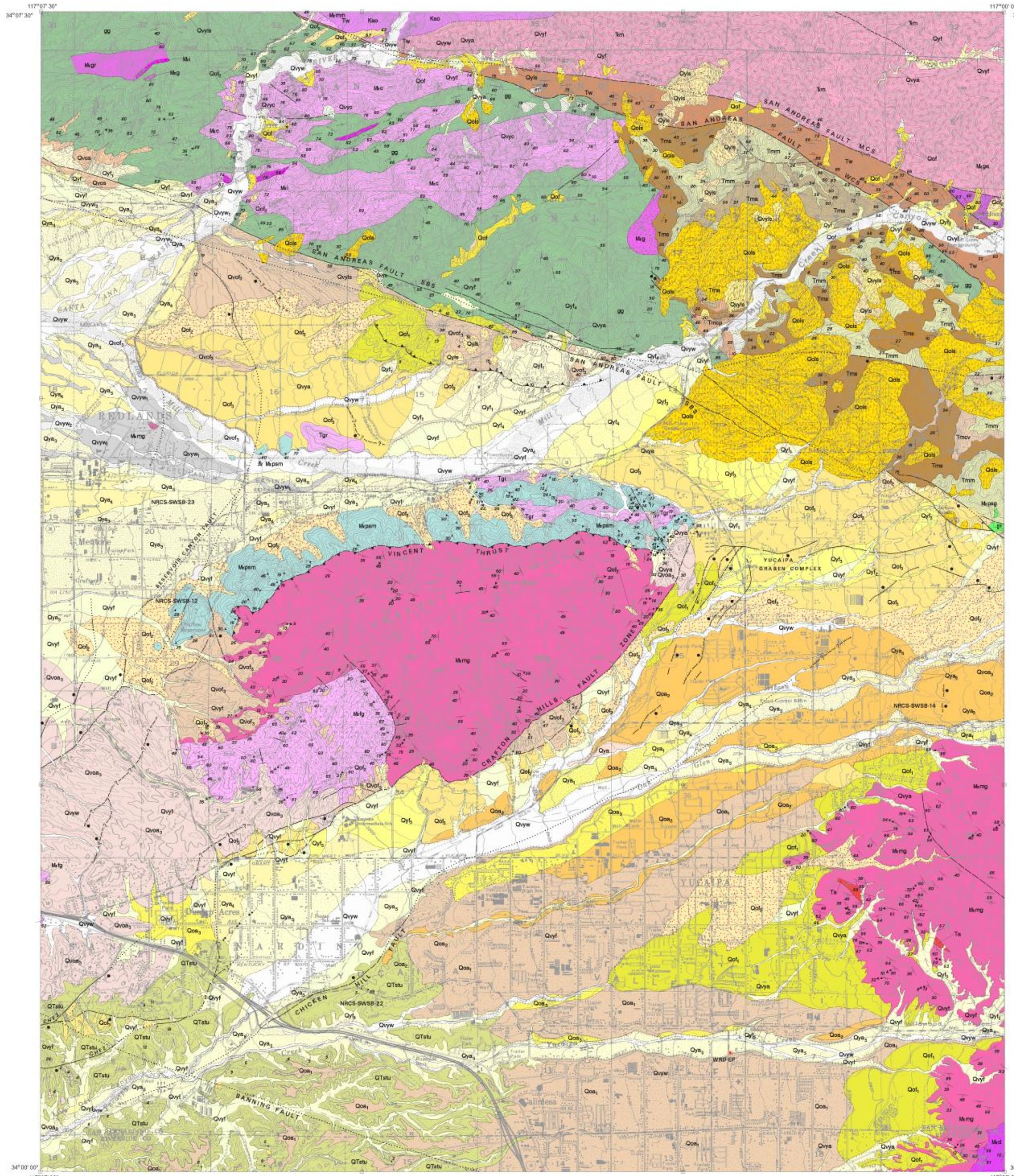
The historical geology of the area has required the District to adopt a multifaceted approach to solving our water supply issues in order to maximize the use of our limited groundwater basins. The following map can be downloaded for more information from http://geo-nsdi.er.usgs.gov/metadata/open-file/03-301/metadata.faq.html.[2]

[1] USGS Geoscience Data Catalog geologic map and digital database of the Yucaipa 7.5' quadrangle, San Bernardino and Riverside Counties, California.
[2] Matti, Jonathan C. , Morton, Douglas C. , Cox, Brett F. , Carson, Scott E. , and Yetter, Thomas J. , 2003, Geologic map and digital database of the Yucaipa 7.5' quadrangle, San Bernardino and Riverside Counties, California: United States Geological Survey Open-File Report 03-301, U.S. Geological Survey, Menlo Park, California.

USGS science for a changing world U.S. DEPARTMENT OF THE INTERIOR U.S. GEOLOGICAL SURVEY

Prepared in cooperation with
SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT
U.S. FOREST SERVICE (San Bernardino National Forest), and
CALIFORNIA GEOLOGICAL SURVEY

OPEN-FILE REPORT 03-301



Base from U.S. Geological Survey Yucaipa, 1967, photorevised 1980

Polyconic projection

SCALE 1:24,000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET

CALIF AREA OF MAP

Geologic features that are located with an accuracy and precision of + or - 15 m meet the geologic-map accuracy standard

Geology mapped by J.C. Matti, 1979-1986, 1991; D.M. Morton, 1977; B.F. Cox, 1978-1980; S.E. Carson, 1979, 1980; T.J. Yetter, 1979

Geology of urbanized areas mapped from 1938 and 1952-vintage aerial photographs; in many places, human modifications obscure depicted geology

Updates and revises a previous geologic map of the Yucaipa 7.5' quadrangle (Matti and others, 1992a)

GEOLOGIC MAP OF THE YUCAIPA 7.5' QUADRANGLE, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA

Version 1.0

Geology by

Jonathan C. Matti,[1] Douglas M. Morton,[2] Brett F. Cox,[3] Scott E. Carson,[3] and Thomas J. Yetter[3]

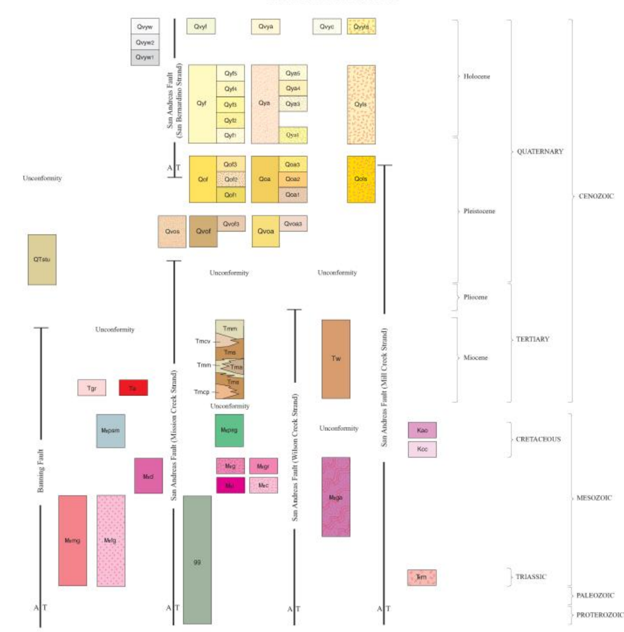
Digital preparation by

Pamela M. Cossette,[4] Bradley Jones,[1] Melinda C. Wright,[2] Steven A. Kennedy,[1] Michael L. Dawson,[2] and Rachel M. Hauser[2]

2003

[1]U.S. Geological Survey Tucson, Arizona [2]U.S. Geological Survey Riverside, California [3]U.S. Geological Survey Menlo Park, California [4]U.S. Geological Survey Spokane, Washington

CORRELATION OF MAP UNITS



This Correlation of Map Units has two features that clarify relations among geologic-map units in the Yucaipa 7.5' quadrangle: (1) To clarify stratigraphic relations among Quaternary surficial units, parent categories for alluvial subunits are shown even though the parent category may not occur in the quadrangle (e.g., the Qoa parent for subunits Qoa2 and Qoa3). The accompanying summary pamphlet provides a discussion of the classification and correlation of surficial deposits in the Yucaipa quadrangle. (2) To clarify relations among major crystalline and sedimentary map units and strands of the San Andreas Fault system that bound them, the correlation chart uses thick vertical lines to show the position of the fault strands (e.g., the Mission Creek Strand of the San Andreas separates map units gg and Mmg). For each fault, short horizontal bars indicate the capping age at which major right-lateral strike-slip displacement ended; for the modern traces of the San Andreas Fault (San Bernardino Strand), the short bar marks the inception of faulting (from Matti and Morton, 1993). See index map for regional distribution of faults; the accompanying pamphlet on the geologic setting of the Yucaipa quadrangle discusses the faults, their history, and their role in juxtaposing major basement terranes. A, fault movement away from the observer; T, fault movement toward the observer

DESCRIPTION OF MAP UNITS

VERY YOUNG SURFICIAL DEPOSITS—Sediment recently transported and deposited in channels and washes, on surfaces of alluvial fans and alluvial valleys, and on hillslopes. Soil-profile development is non-existant to minimal. Includes:

Qvyw **Very young wash deposits, active (latest Holocene)**—Unconsolidated sand and gravel deposits in active washes

Qvyw2 **Very young wash deposits, Unit 2 (latest Holocene)**—Unconsolidated sandy cobble-boulder gravel that probably is entrained by active stream flows only intermittently

Qvyw1 **Very young wash deposits, Unit 1 (latest Holocene)**—Unconsolidated cobble-boulder gravel that probably is abandoned by active stream flows

Qvyf **Very young alluvial-fan deposits (latest Holocene)**—Unconsolidated to slightly consolidated sand and sandy gravel deposits that form active parts of alluvial fans

Qvya **Very young axial-valley deposits (latest Holocene)**—Unconsolidated sandy to cobbly alluvium of through-going stream valleys

Qvyc **Very young colluvial deposits (latest Holocene)**—Unconsolidated and incoherent soil material and (or) rock fragments deposited on slopes and at base of slopes

Qvyls **Very young landslide deposits (latest Holocene)**—Slope-movement deposits of soil and rubble and (or) displaced bedrock blocks

YOUNG SURFICIAL DEPOSITS—Sedimentary units that are slightly to moderately consolidated and slightly to moderately dissected. Alluvial-fan deposits (Qyf series) typically have high coarse:fine ratios; axial-valley deposits (Qya series) typically have low coarse:fine ratios. Upper surfaces commonly capped by slight to moderately developed pedogenic-soil profiles (A/AC to A/AC/Bcambic profiles with oxidized C horizon). Includes:

Qyf **Young alluvial-fan deposits (Holocene and latest Pleistocene)**—Slightly to moderately consolidated sand and gravel. Units distinguished from each other on the basis of soil-profile development and relative position in local terrace-riser succession. Includes:

Qyf5 **Young alluvial-fan deposits, Unit 5 (latest Holocene)**

Qyf4 **Young alluvial-fan deposits, Unit 4 (late Holocene)**

Qyf3 **Young alluvial-fan deposits, Unit 3 (middle Holocene)**

Qyf2 **Young alluvial-fan deposits, Unit 2 (early Holocene)**

Qyf1 **Young alluvial-fan deposits, Unit 1 (early Holocene and latest Pleistocene)**

Qya **Young axial-valley deposits (Holocene and latest Pleistocene)**—Slightly to moderately consolidated silt, sand, and gravel. Units distinguished from each other on the basis of soil-profile development and relative position in local terrace-riser succession. Includes:

Qya5 **Young axial-valley deposits, Unit 5 (latest Holocene)**

Qya4 **Young axial-valley deposits, Unit 4 (late Holocene)**

Qya3 **Young axial-valley deposits, Unit 3 (middle Holocene)**

Qya1 **Young axial-valley deposits, Unit 1 (early Holocene and latest Pleistocene)**

Qyls **Young landslide deposits (Holocene and latest Pleistocene)**—Slightly dissected slope-movement deposits. Locally may include old landslide material

OLD SURFICIAL DEPOSITS—Sedimentary units that are moderately consolidated and slightly to moderately dissected. Alluvial-fan deposits (Qof series) typically are gravelly, but include sand and silt; axial-valley deposits (Qoa series) are dominated by sand with minor gravel. Upper surfaces commonly capped by moderately to well-developed pedogenic soils (A/AB/B/C profiles with Bt horizons as much as 1 to 2 m thick and maximum hues typically in the range of 10YR 5/4 and 6/4 [yellowish brown and light yellowish brown] through 7.5YR 6/4 to 4/4 [light brown to dark brown] but reaching 5YR 5/6 [yellowish red]). Includes:

Qof **Old alluvial-fan deposits (late to middle Pleistocene)**—Moderately to well consolidated silt, sand, and gravel. Units distinguished from each other on the basis of soil-profile development and relative position in local terrace-riser succession. Includes:

Qof3 **Old alluvial-fan deposits, Unit 3 (late to middle Pleistocene)**

Qof2 **Old alluvial-fan deposits, Unit 2 (late to middle Pleistocene)**

Qof1 **Old alluvial-fan deposits, Unit 1 (late to middle Pleistocene)**

Old axial-valley deposits (late to middle Pleistocene)—Moderately to well consolidated silt, sand, and gravel. Units distinguished from each other on the basis of soil-profile development and relative position in local terrace-riser succession. Includes:

Qoa3 **Old axial-valley deposits, Unit 3 (late to middle Pleistocene)**

Qoa2 **Old axial-valley deposits, Unit 2 (late to middle Pleistocene)**

Qoa1 **Old axial-valley deposits, Unit 1 (late to middle Pleistocene)**

Qols **Old landslide deposits (late to middle Pleistocene)**—Moderately dissected slope-movement deposits. Probably inactive under current climatic and tectonic conditions

VERY OLD SURFICIAL DEPOSITS—Sedimentary units that are moderately to well consolidated to indurated, and moderately to well dissected. Alluvial-fan deposits (Qvof series) typically are gravelly, but include sand and silt; axial-valley deposits (Qvoa series) are dominated by sand with minor gravel. Upper surfaces are capped by moderate to well developed pedogenic soils (A/AB/B/C_{ox} profiles with Bt horizons as much as 2 to 3 m thick and maximum hues in the range of 7.5YR 6/4 to 4/4 [light brown to dark brown] and 2.5YR 5/6 [red]). Includes:

Qvos **Very old surficial deposits, undifferentiated (middle to early Pleistocene)**—Well dissected, slightly to moderately consolidated alluvium

Very old alluvial-fan deposits (middle to early Pleistocene)—Moderately to well consolidated silt, sand, and gravel. Units distinguished from each other on the basis of soil-profile development and relative position in local terrace-riser succession. Includes:

Qvof3 **Very old alluvial-fan deposits, Unit 3 (middle to early Pleistocene)**

Very old axial-valley deposits (middle to early Pleistocene)—Moderately to well consolidated silt, sand, and gravel. Units distinguished from each other on the basis of soil-profile development and relative position in local terrace-riser succession. Map units include:

Qvoa3 **Very old axial-valley deposits, Unit 3 (middle to early Pleistocene)**

CENOZOIC AND MESOZOIC ROCKS WEST OF SAN ANDREAS FAULT

QTstu **San Timoteo beds of Frick (1921), upper member (Pleistocene and Pliocene)**—Nonmarine sandstone and conglomerate. Forms upper part of thick sedimentary sequence Frick (1921, p. 314) referred to as Tertiary Deposits of the San Timoteo Badlands—specifically his "San Timoteo beds" or "Upper San Timoteo Deposition" (Frick, 1921, p. 283, 317)

Tgr **Granodiorite (Tertiary)**—Granodioritic quartz porphyry occurring as sills and small bodies intrusive into Pelona Schist

Ta **Andesite to dacite (Tertiary)**

Mpsm **Pelona Schist, muscovite schist unit (Mesozoic protolith)**

Mmg **Mylonitic and cataclastic granitoid rock (Mesozoic)**

Mfg **Foliated granitoid rock (Mesozoic)**

Md **Diorite (Mesozoic)**

CENOZOIC AND MESOZOIC ROCKS BETWEEN MISSION CREEK AND WILSON CREEK STRANDS OF SAN ANDREAS FAULT

Mill Creek Formation of Gibson (1971) (Miocene)—Nonmarine claystone, mudstone, sandstone, and conglomerate. Includes five informal subunits based on overall lithologic character, including from youngest to oldest:

Tmm **Mill Creek Formation of Gibson (1971), mudrock unit (Miocene)**—Stratigraphic interval where mudrock predominates over sandstone

Tmcv **Mill Creek Formation of Gibson (1971), volcanic-clast-bearing unit (Miocene)**—Sandstone and conglomeratic sandstone

Tms **Mill Creek Formation of Gibson (1971), sandstone unit (Miocene)**—Stratigraphic interval where sandstone predominates over mudrock

Tma **Mill Creek Formation of Gibson (1971), arkose unit (Miocene)**—Stratigraphic interval dominated by feldspar-rich arkosic sandstone

Tmcp **Mill Creek Formation of Gibson (1971), Pelona Schist-bearing conglomerate unit (Miocene)**

gg **Gneissose granitoid rock and gneiss (Mesozoic and older)**—Compositionally and texturally heterogeneous igneous and plutonic complex

Mg **Granitoid rock (Mesozoic)**

Mgr **Mesocratic granitoid rock (Mesozoic)**

Mi **Inclusion-rich granitoid rock (Mesozoic)**

Mc **Diorite of Cram Peak (Mesozoic)**

Mpsg **Pelona Schist, greenstone unit (Mesozoic protolith)**

CENOZOIC AND MESOZOIC ROCKS BETWEEN MILL CREEK AND WILSON CREEK STRANDS, SAN ANDREAS FAULT

Tw **Formation of Warm Springs Canyon (Miocene?)**—Nonmarine sandstone and conglomerate mapped by Morton and Miller (1975, figs. 1c-1g) along southwest margin of San Bernardino Mountains

Mga **Orthogneiss of Alger Creek (Mesozoic?)**

ROCKS EAST OF SAN ANDREAS FAULT

Kao **Granodiorite of Angeles Oaks (Cretaceous)**

Kcc **Monzogranite of City Creek (Cretaceous)**

Tim **Porphyritic monzogranite (Triassic)**

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Contact—Separates geologic-map units. Solid where meets map-accuracy standard; dashed where may not meet map-accuracy standard; dotted where concealed

Contact—Separates terraced alluvial units where younger alluvial unit is incised into older alluvial unit; hachures at base of slope, point toward topographically lower surface. Solid where meets map-accuracy standard; dashed where may not meet map-accuracy standard

Landslide crown scarp—Demarcates pull-away zone at head of landslide mass; may not meet map-accuracy standard. May form geologic contact between landslide mass and bedrock, or may separate discrete landslide masses. Hachures point downslope

Fault—Solid where meets map-accuracy standard; dashed where may not meet map-accuracy standard. Dotted where concealed by mapped covering unit; queried where existence uncertain. Hachures indicate scarp, with hachures on down-dropped block. Paired arrows indicate relative movement; single arrow indicates direction and amount of fault-plane dip. Bar and ball on down-thrown block

Thrust fault—Solid where meets map-accuracy standard; dashed where may not meet map-accuracy standard. Dotted where concealed by mapped covering unit; queried where existence uncertain. Sawteeth on upper plate; hachures at base of slope on downthrown block of fault scarp

Fault-name abbreviations

Crafton Hills Fault Zone—CHFZ

San Andreas Fault—MCS, Mill Creek Strand; MiCS, Mission Creek Strand; SBS, San Bernardino Strand; WCS, Wilson Creek Strand

San Timoteo Canyon Fault Zone—STCFZ

Ground fissure (as mapped by Burnham, 1952)

Strike and dip of sedimentary layeringStrike and dip of sedimentary layering

Inclined

Vertical

Overturned

Binocular determination

Compiled

Strike and dip of foliation of mineral grains, inclusions, or schlieren in igneous rocks

Inclined

Vertical

Mineral foliation and (or) gneissose layering in metamorphic rocks

Inclined

Vertical

Strike and dip of foliation and gneissose compositional layering (origin not determined) in metamorphic and igneous complex (unit gg)

Inclined

Vertical

Mineral foliation and (or) gneissose layering in cataclastic and (or) mylonitic rocks

Inclined

Vertical

Azimuth and plunge of lineations

Streaking of crushed mineral grains

Alignment of elongate crystals

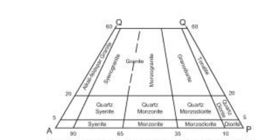
Rodding and ridging

Minor-fold axis

	Induration State	Field Criterion	Relative Density (D_r)[1]
Unconsolidated Sediment	Very slightly consolidated	Easily indented with fingers	0.00—0.20
	Slightly consolidated	Somewhat less easily indented with fingers; easily shoveled	0.20—0.40
	Moderately consolidated	Shoveled with difficulty	0.40—0.70
Consolidated Rock	Well consolidated	Requires pick to loosen for shoveling	0.70—0.90
	Lithified	Requires blasting or heavy equipment to	0.90—1.00
	Indurated	Rings to the blow of a hammer	1.00

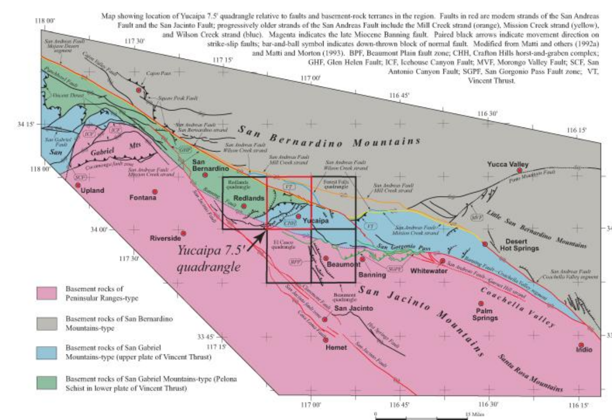
Criteria for distinguishing and classifying various categories of unconsolidated sediment and consolidated rock (modified from Bowles, 1984, Table 5-2)

[1]As translated by Bowles (1984, p. 151-152), relative density is an engineering parameter that relates void space determined in the laboratory to a ratio involving index values of minimum and maximum void space for specified materials under specified conditions. Void space in turn is related to in situ dry unit weight. Also see the Glossary of Geology definition of relative density in Section 3.1.



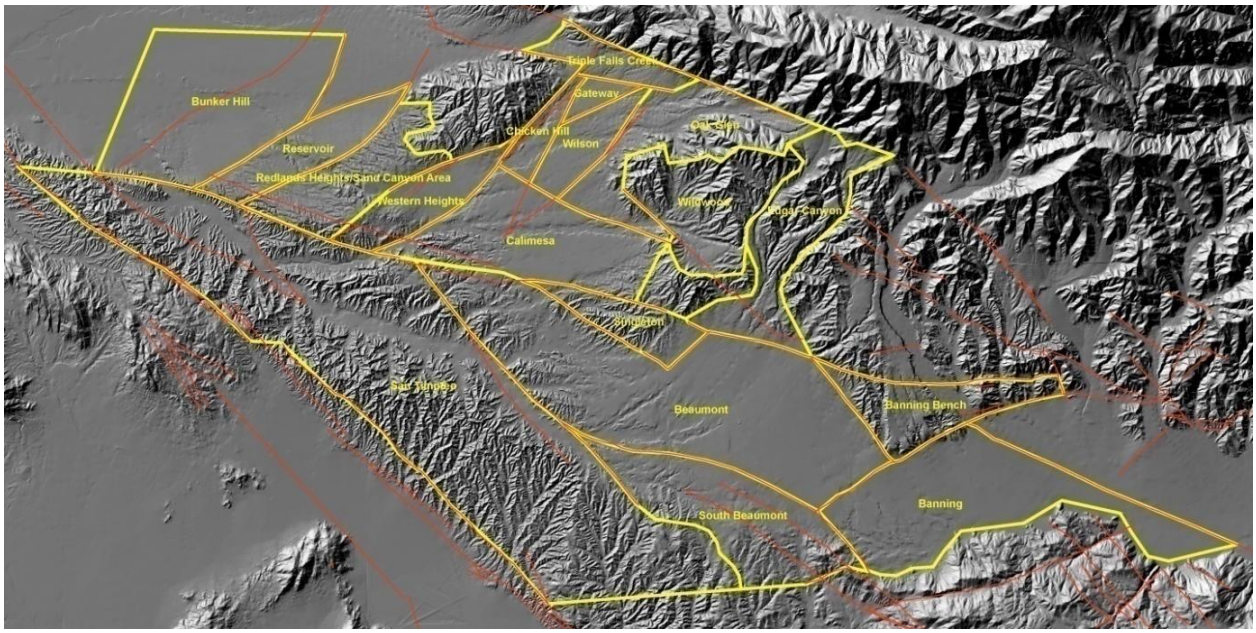
Classification of plutonic rock types (from IUGS, 1973, and Streckeisen, 1976). A, alkali feldspar; P, plagioclase feldspar; Q, quartz.

Map showing location of Yucaipa 7.5' quadrangle relative to faults and basement-rock terranes in the region. Faults in red are modern strands of the San Andreas Fault and the San Jacinto Fault; progressively older strands of the San Andreas Fault include the Mill Creek strand (orange), Mission Creek strand (yellow), and Wilson Creek strand (blue). Magenta indicates the late Miocene Banning fault. Paired black arrows indicate movement direction on strike-slip faults; bar-and-ball symbol indicates down-thrown block of normal fault. Modified from Matti and others (1992a) and Matti and Morton (1993). BPF, Beaumont Plain fault zone; CHH, Crafton Hills horst-and-graben complex; GHF, Glen Helen Fault; ICF, Icehouse Canyon Fault; MVF, Morongo Valley Fault; SCF, San Antonio Canyon Fault; SGPF, San Gorgonio Pass Fault zone; VT, Vincent Thrust.



The extensive faults and active geology of the Yucaipa Valley creates a unique configuration of groundwater basins with hydrogeologic conditions that are fairly distinct for each subbasin within the region. Studies conducted by the USGS (Moreland, 1970) and David Keith Todd (Todd, 1988) have estimated the safe yield of the collective subbasins at 7,100 and 7,900 acre-feet/year, respectively. Both studies represent the best available estimate of the safe yield for the collective Yucaipa basins.

Figure 2-6 – Fault Boundaries within the Upper Santa Ana Watershed



Source: The Perennial Yield of the Yucaipa Groundwater Basin, December 1988, David Keith Todd Consulting Engineers, Inc., Berkeley, California.

Historic extractions from this basin since 1949 have fluctuated between 10,000 and 12,000 acre-feet/year as reported in these studies. In general, water levels in the majority of the subbasins experienced a steady decline between the mid 1940's and 1970's. In the late 1970's, the water levels began to level off but continued to decline.

Historical records indicate that only very small amounts of local runoff have been retained in the Wilson spreading facilities since the basins have been historically used for flood control purposes. Information adapted from the 1988 Todd report indicates that during the 1934-64 period annual diversions for retention into these basins ranged from less than 10 to over 1,200 acre-feet/year, with an average of about 250 acre-feet/year.

The amount of water recharged in these basins is very small when compared to their spreading capacity and the amount of water available for recharge. The Wilson spreading basins have a recharge area of approximately 12 acres. Infiltration test conducted by Moreland (1970) indicate that the infiltration capacity of these basins is approximately 1.5 feet per day. Similar infiltration rates were calculated in the Reclaimed Water Master Plan (MacDonald Stephens, 1992) by reviewing daily inflow records of imported water from Mill Creek over a 35 day period to determine the long term infiltration rates. The results of that observation indicate an infiltration rate of 0.7 cfs per acre, which is equivalent to 1.4 feet per day.

2.3.3 Groundwater Management Zones

On January 22, 2004, the Santa Ana Regional Water Quality Control Board adopted Resolution R8-2004-0001, which amended the water quality control plan for the Santa Ana Watershed. This basin plan document established groundwater management zones to ensure historical water quality is maintained, pursuant to the State of California antidegradation policy (SWRCB Resolution No. 68-16).

For Yucaipa Valley Water District and two other entities, less stringent "maximum benefit" objectives were established based on demonstrations by the agencies that antidegradation requirements were satisfied. Specifically, the Yucaipa Valley Water District demonstrated that beneficial uses would continue to be protected and showed that water quality consistent with maximum benefit to the people of the State of California would be maintained. Other factors, such as economics, the need to use recycled water, and the need to develop housing in the area were also taken into account in establishing the objectives.

The demonstration of "maximum benefit" by the Yucaipa Valley Water District is contingent on the implementation of specific projects and programs. Provided that the commitments are met, then the Yucaipa Valley Water District has demonstrated maximum benefit, and the "maximum benefit" objectives included for these waters apply for the purposes of regulating projects. However, if the Regional Board finds that these commitments are not being met and that "maximum benefit" is thus not demonstrated, then the "antidegradation" objectives for these waters will apply.

Figure 2-7- San Timoteo Watershed Management Zone Boundaries

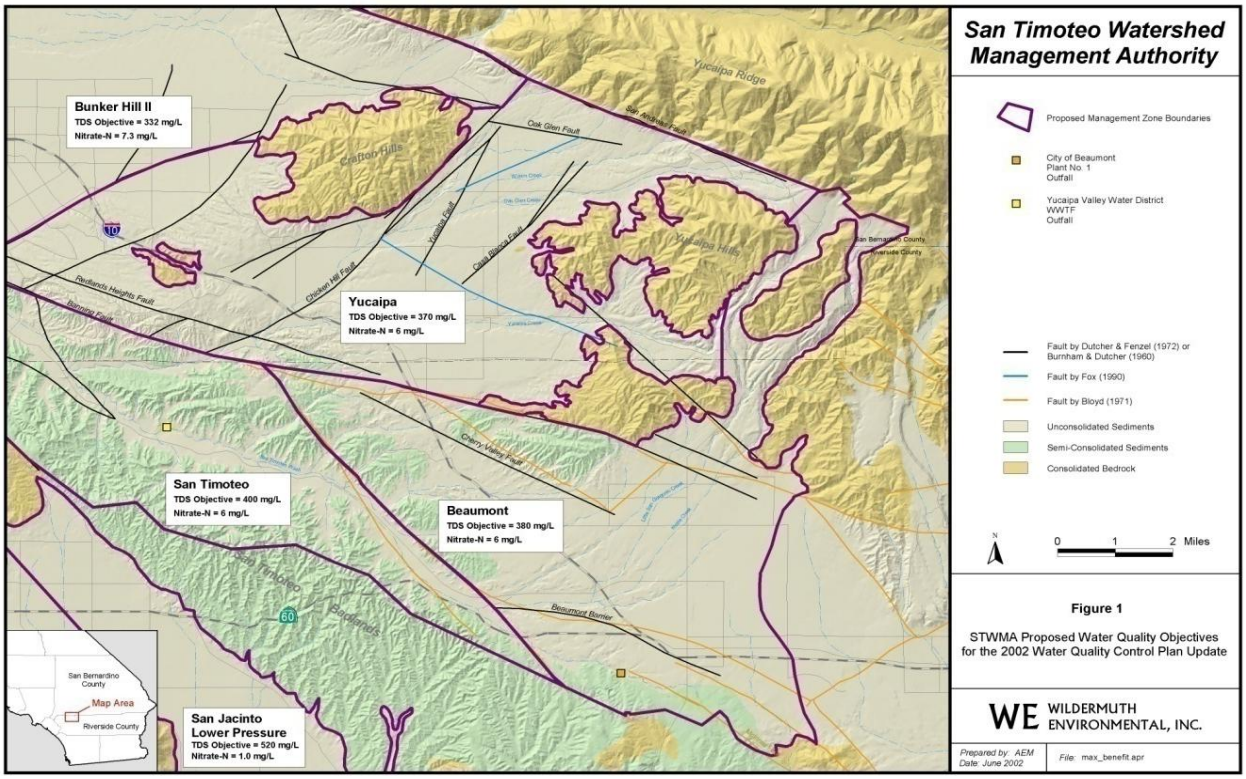
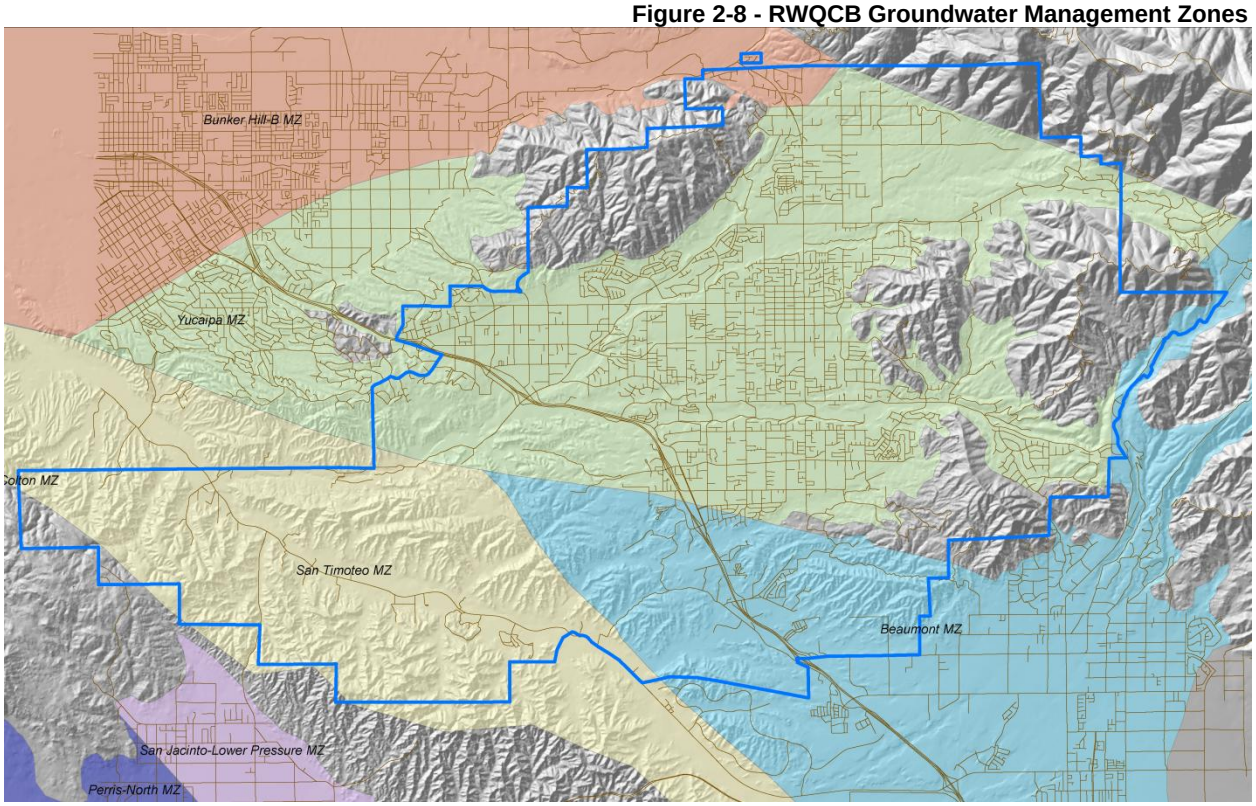


Figure 2-8 - RWQCB Groundwater Management Zones

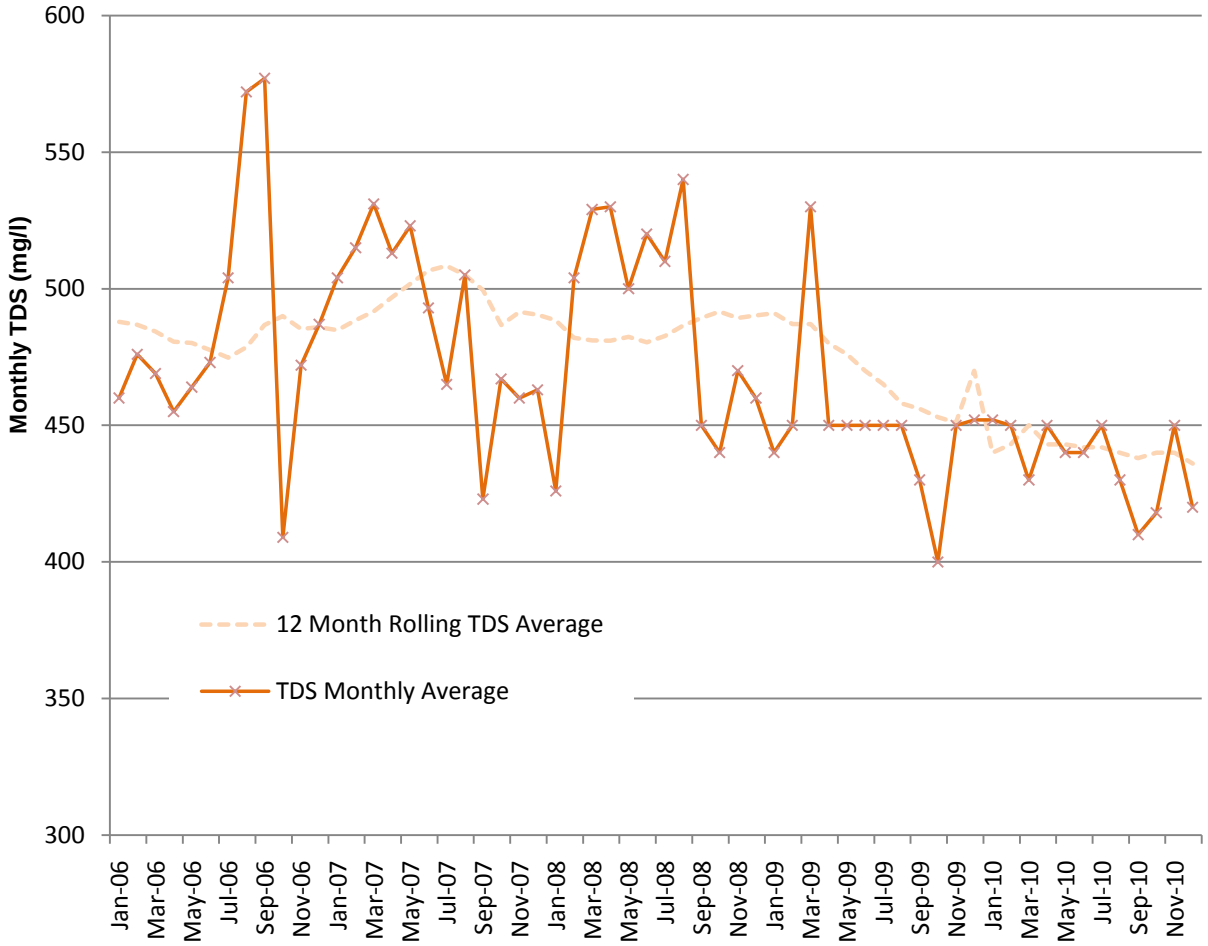


Federal law requires states to establish water quality standards for all water bodies within the state's jurisdiction. A water quality standard is comprised of three parts: 1) the beneficial uses that apply to the water body; 2) the water quality criteria needed to protect those uses; and 3) an antidegradation policy to protect water quality that is already better than the applicable criteria. The Porter-Cologne Water Quality Control Act (Division 7, "Water Quality", of the California Water Code) establishes similar requirements in state law.

In California, Regional Water Quality Control Boards enact water quality standards through a formal basin planning process that sets groundwater quality objectives. Each Regional Board publishes a Basin Plan that identifies individual water bodies within its jurisdiction, designates the beneficial uses that apply to each water body and specifies the water quality criteria (or objectives) for those water bodies. Although the federal Clean Water Act applies only to surface waters, the Porter-Cologne Act applies to both the ground and surface waters of California.

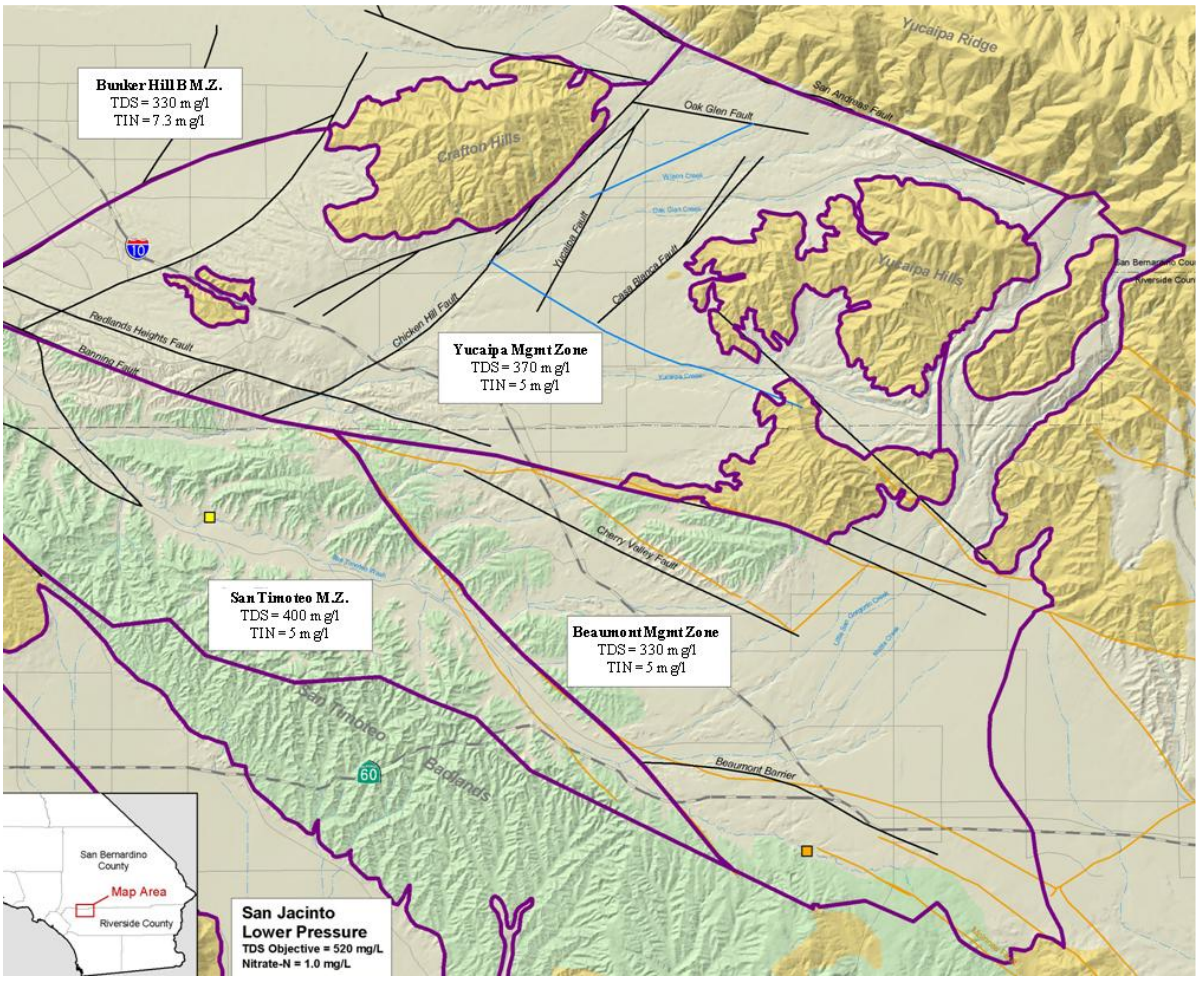
Of particular concern to the Yucaipa Valley Water District are the limitations set for total dissolved solids or typical salt (salinity) constituents in the recycled water supply. Below is a diagram of the recycled water total dissolved solids concentrations from the Wochholz Regional Water Recycling Facility.

Figure 2-9 Wochholz Regional Water Recycling Facility TDS Concentrations



The monthly value of total dissolved solids in the recycled water supply is 450 mg/l with a twelve-month average of 437 mg/l. To utilize the recycled water in the upper portion of the Santa Ana Watershed, the quality of the recycled water needs to meet an average quality of 330 mg/l for the Beaumont Management Zone; 370 mg/l for the Yucaipa Management Zone; or 400 mg/l for the San Timoteo Management Zone. In all cases, the amount of salt, or total dissolved solids of the recycled water, is more than the water quality objective set by the Regional Water Quality Control Board. These water quality objectives severely constrain the District from utilizing our recycled water without additional water treatment.

Figure 2-10 – San Timoteo Watershed TDS and TIN Water Quality Objectives



While these stringent objectives will result in additional costs for the District and our customers, these standards are actually relaxed based on a demonstration that less restrictive water quality objectives provide a benefit to the people of California. The most protective water quality objectives are established as the "antidegradation" values and will be triggered if certain commitments are not fully achieved.

Table 2-2- Total Dissolved Solids (Salinity Objectives) Impacting Yucaipa Valley Water District

Groundwater Management Zone	Maximum Benefit Objective	Antidegradation Objective
San Timoteo	400 mg/l	300 mg/l
Yucaipa	370 mg/l	320 mg/l
Beaumont	330 mg/l	230 mg/l

The commitments made by the District in order to maintain the Maximum Benefit Objectives include the following provisions as contained within our waste discharge permit adopted on February 2, 2007 by the Regional Water Quality Control Board (WDR Permit CA 0105619).

Table 2-3 – Yucaipa Valley Water District Maximum Benefit Objectives

Description of Commitment	Compliance Date – as soon as possible, but no later than
1. Surface Water Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Quarterly data report submittal d. Annual data report submittal	a. January 23, 2005 b. Within 30 days from Regional Board approval of monitoring plan c. April 15, July 15, October 15, January 15 d. February 15th
2. Groundwater Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Annual data report submittal	a. January 23, 2005 b. Within 30 days from Regional Board approval of monitoring plan c. February 15th
3. Desalter(s) and Brine Disposal Facilities a. Submit plan and schedule for construction of desalter(s) and brine disposal facilities. Facilities are to be operational as soon as possible but no later than 7 years from date of Regional Board approval of plan/schedule. b. Implement the plan and schedule	a. Within 6 months of either of the following: i. When YVWD's effluent 5-year running average TDS exceeds 530 mg/L; and/or ii. When volume weighted average concentration in the Yucaipa Management Zone of TDS exceeds 360 mg/L b. Within 30 days from Regional Board approval of plan
4. Non-potable water supply Implement non-potable water supply system to serve water for irrigation purposes. The non Potable supply shall comply with a 10-year running average TDS concentration of 370 mg/L or less.	December 23, 2014
5. Recycled water recharge The recharge of recycled water in the Yucaipa or San Timoteo Management Zones shall be limited to the amount that can be blended with other recharge sources to achieve a 5-year running average equal to or less than the "maximum-benefit" objectives for TDS and nitrate-nitrogen for the relevant Management Zones. a. Submit baseline report of amount locations, and TDS and nitrogen quality of storm water/imported water recharge. b. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of YVWD enhanced recharge facilities.	Compliance must be achieved by end of 5th year after initiation of recycled water use/recharge operations. a. Prior to initiation of construction of basins/other facilities to support enhanced storm water/imported water recharge. b. Annually, by January 15th, after initiation construction of facilities/implementation of programs to support enhanced recharge.
6. Ambient groundwater quality	July 1, 2005 and every 3 years thereafter

determination	
7. Replace denitrification facilities (necessary to comply with TIN wasteload allocation specified in Table 5-5)	New facilities shall be operational no later than December 23, 2007
8. YVWD recycled water quality improvement plan and schedule a. Submit plan and schedule b. Implement Plan and schedule	 a. 60 days after the TDS 12-month running average effluent quality equals or exceeds530 mg/L for 3 consecutive months and/or the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once replacement denitrification facilities are in place. b. Upon approval by Regional Board
9. Remove/reduce the discharge of YVWD effluent from the unlined portion of San Timoteo Creek a. Submit proposed plan/schedule b. Implement plan/schedule	 a. June 23, 2005 b. Upon Regional Board approval
10. Construct the Western Regional Interceptor for Dunlap Acres a. Submit proposed construction plan and schedule. The schedule shall assure the completion of construction as soon as possible but no later than January 1, 2010. b. Implement plan and schedule	 a. June 23, 2005 b. Upon Regional Board approval

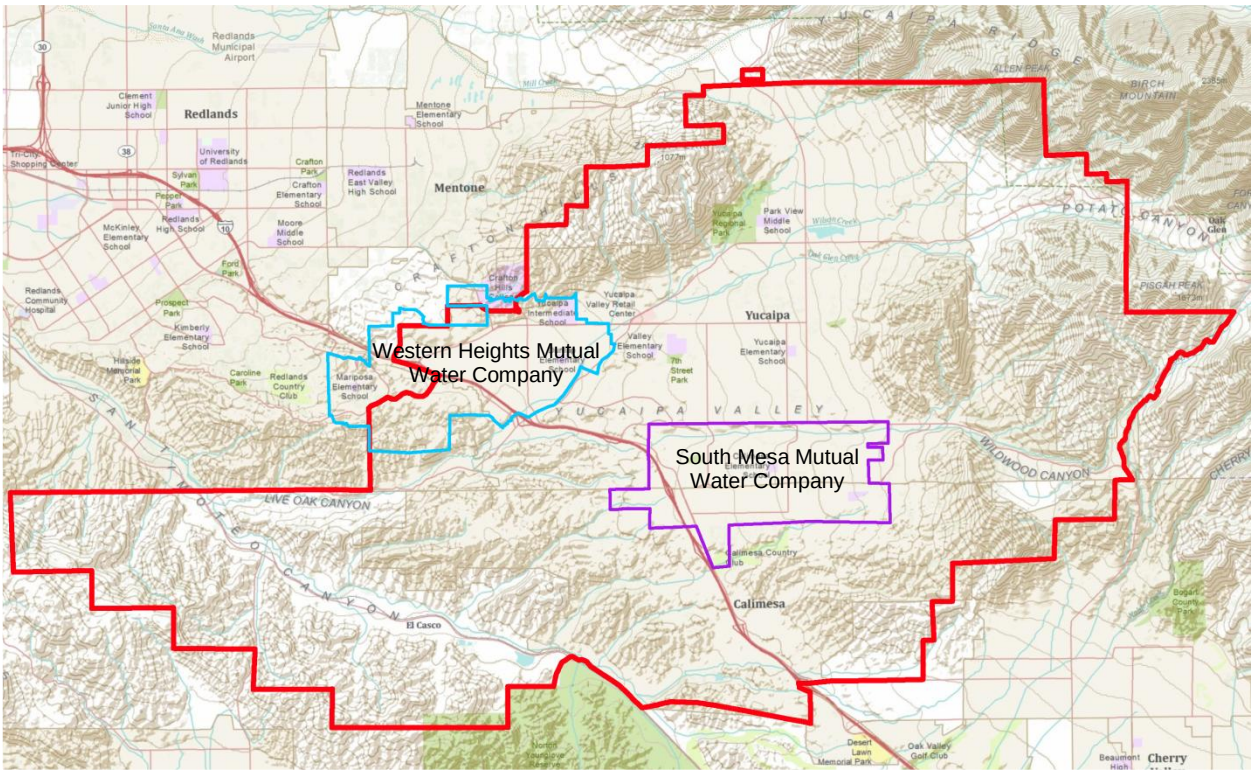
The District continues to meet the commitments, however in November 2010, the District learned of the lack of assimilative capacity in the San Timoteo Management Zone which now requires the immediate implementation of reduced total dissolved solids to a five-year average of 400 mg/l in order not to trigger the even more restrictive and costly antidegradation objectives.

2.3.4 Mutual Water Company Service Areas

The service area of the Yucaipa Valley Water District includes two mutual water companies the Western Heights Water Company and the South Mesa Water Company. The service area of the Western Heights Mutual Water Company is 4.53 square miles (2,902 acres) and the service area of the South Mesa Mutual Water Company is 4.00 square miles (2,561 acres).

The history of water companies in the Yucaipa Valley begins with the incorporation of the South Mountain Water Company on May 26, 1899. This company was formed to transport water from Oak Glen to the City of Redlands. On November 17, 1899 the Yucaipa Land and Water Company was incorporated to provide water directly to the Yucaipa Valley. Additional water companies formed in the Yucaipa Valley with the formation of the Redlands and Yucaipa Land Company in 1909 and the Redlands and Yucaipa Water Company in 1910.

Figure 2-11 - Mutual Water Companies within the Sphere of Influence of the Yucaipa Valley Water District



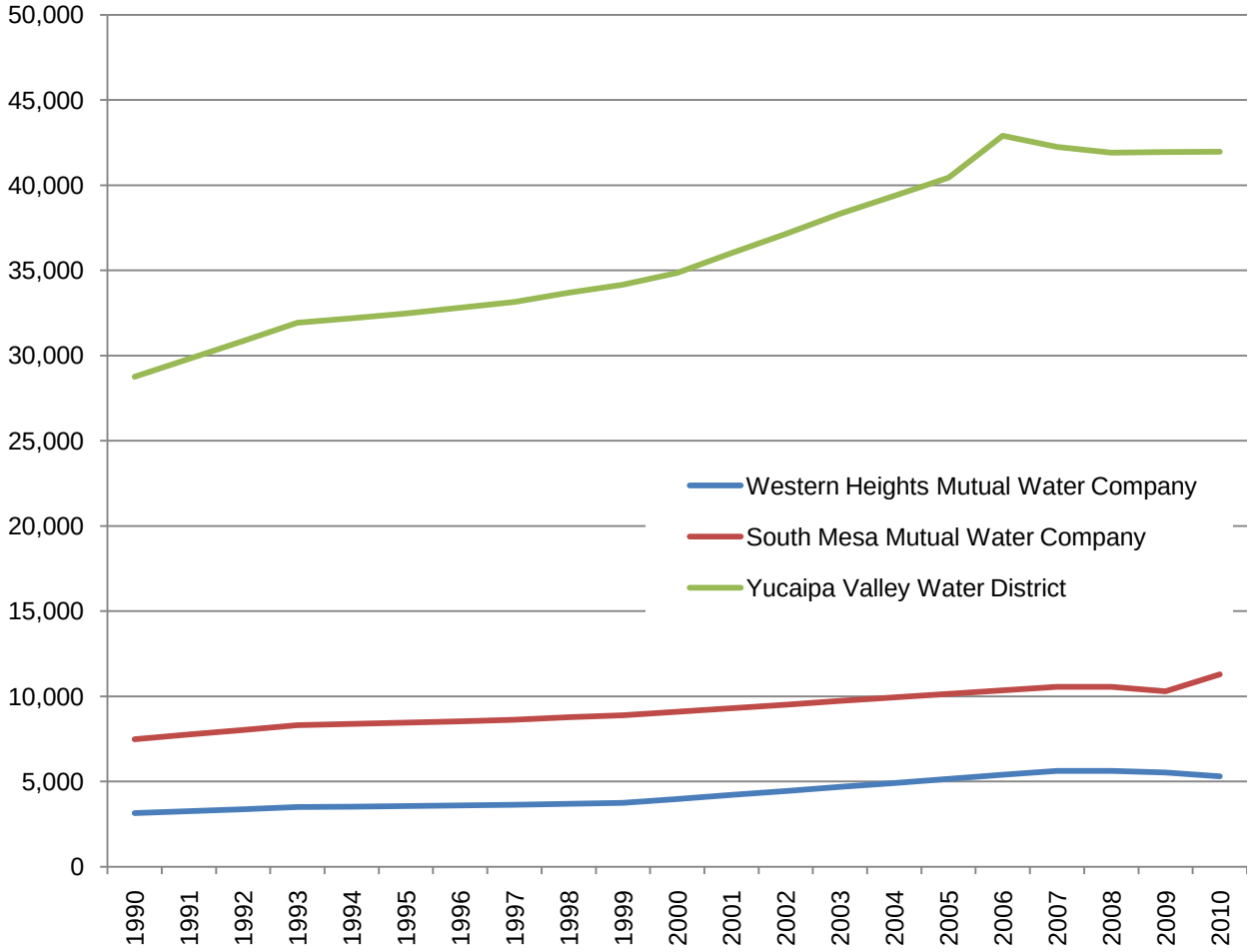
The Redlands and Yucaipa Land Company continued to expand and formed separate companies to provide water service in various areas within the Yucaipa Valley. Most of the companies are now consolidated within the Yucaipa Valley Water District's service area boundary.

Table 2-4 – Summary of Mutual Water Company Formations in the Yucaipa Valley

Company	Date Incorporated	Notes
Yucaipa No. 1	February 4, 1910	Currently part of Yucaipa Valley Water District
Yucaipa No. 2	February 17, 1912	Name changed to Western Heights Mutual Water Company on June 12, 1913.
Yucaipa No. 3	November 2, 1912	Name changed to South Mesa Water Company on June 12, 1913.
Yucaipa Domestic	January 30, 1912	Currently part of Yucaipa Valley Water District
Triple Falls	November 7, 1912	Currently part of Yucaipa Valley Water District
Section 30	October 12, 1921	Currently part of Yucaipa Valley Water District

In the future, the population of Western Heights Mutual Water Company and South Mesa Water Company are expected to have limited growth as compared to the larger service area boundary of the Yucaipa Valley Water District. The chart below illustrates the twenty year population trends for each water service area in the Yucaipa Valley.

Figure 2-12 - Population Trends for Water Agencies in the Yucaipa Valley



2.4 The Climate of the Yucaipa Valley

Describe the service area climate (California Water Code Section 10631(a))

Temperatures in the District range from an average high of 78º and an average low of 49º. The record high for the area is 117º and the record low is 17º.

The annual average rainfall for the area is about 15.80 inches per year. The climate is characterized by hot dry summers when temperatures can rise above 100º, and moderate winters, with rare freezing temperatures. A major portion of the precipitation occurs between December and March. Snow in the upper reaches of the area is possible, but is not considered an important contributing factor to runoff.

Figure 2-13 – Yucaipa Valley Water District Average Daily Accumulated Precipitation

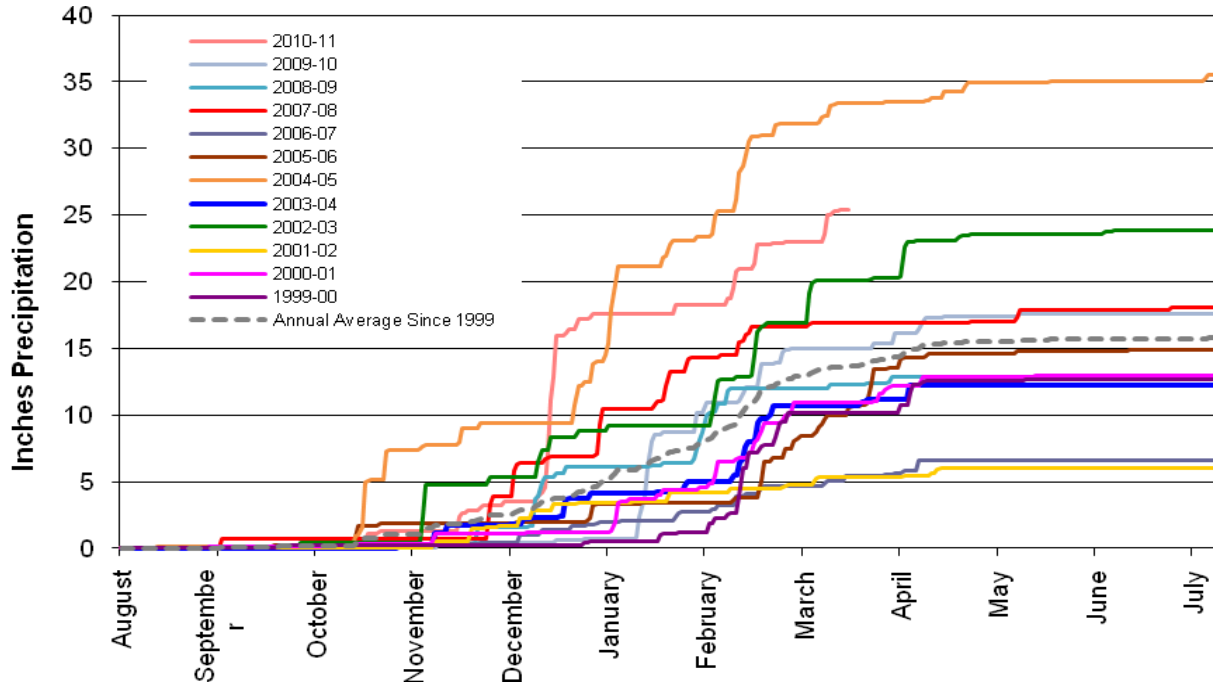


Figure 2-14 – Yucaipa Valley Water District Maximum and Average Daily Rainfall Since 1999

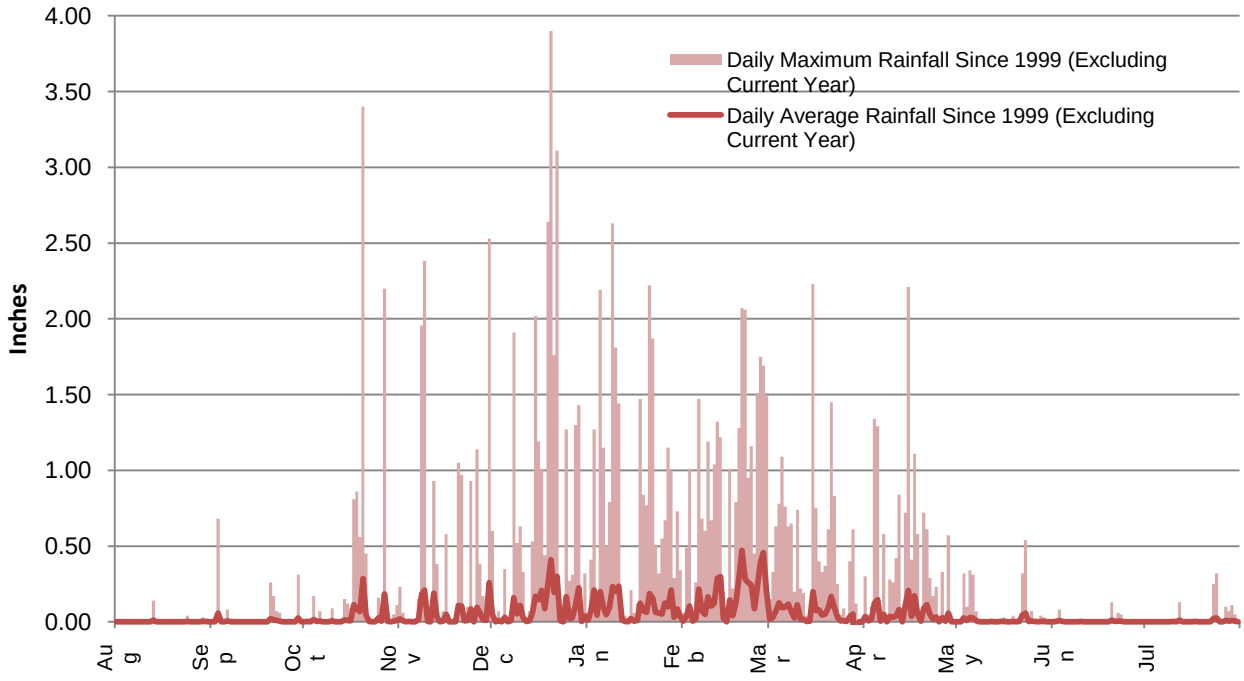


Table 2-5- Climate Data for Yucaipa Valley Water District Service Area

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Standard Monthly Avg. ET0 (inches)	3.32	2.41	4.62	5.58	6.32	5.37	7.60	6.68	5.89	4.40	3.18	2.08	57.45
Avg. Total Precipitation (inches)	2.67	2.65	2.31	1.18	0.48	0.11	0.06	0.15	0.29	0.70	1.14	1.79	13.53
Avg. Max. Temperature (degrees F)	64.7	66.1	69.1	73.7	78.5	86.7	94.5	94.2	90	81	72.6	65.9	78.1
Avg. Min. Temperature (degrees F)	39.3	41.3	43.6	46.8	51.1	55.2	60.3	60.6	57.5	51.2	44	39.6	49.2

Average evapotranspiration from a standardized grass surface (reference evapotranspiration or ET0) was found on the California Irrigation Management System (CIMIS) website. The nearest CIMIS station is at the University of California, Riverside, Station #44, which has been operating since June 1985.[b] Average temperature and precipitation information for Redlands, CA is from the National Oceanic and Atmospheric Administration (NOAA) website http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?caredl. The period of record is from 12/1/1927 to 3/31/2005.

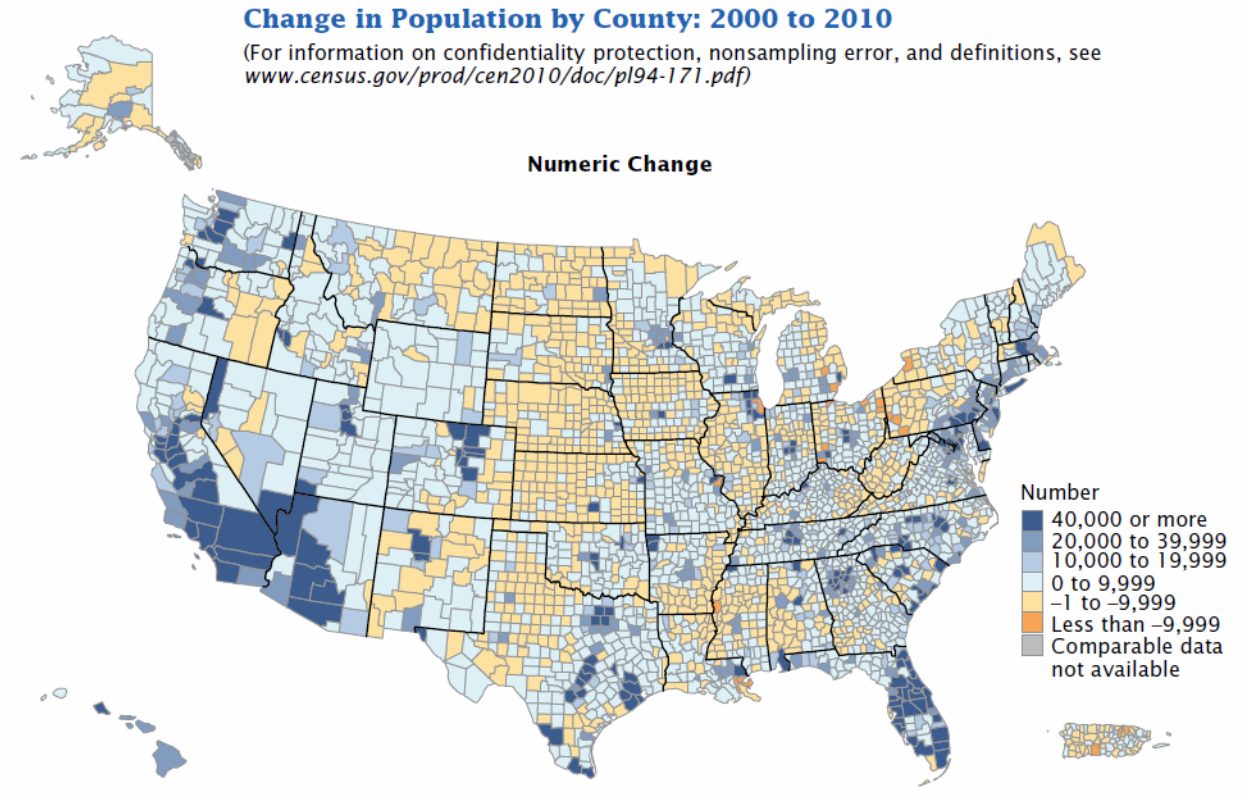
2.5 Population and Demographics

(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . . (California Water Code Section 10631(a)).
(Population projections) shall be in five-year increments to 20 years or as far as data are available (California Water Code Section 10631(a)).

Table 2-6 - Population Data and Estimates

	1990	2000	2010	2015	2020	2025	2030	2035	2040
Western Heights Mutual Water Company	3,152	4,060	5,313	5,611	5,954	6,444	6,916	7,179	7,407
South Mesa Mutual Water Company	7,486	9,000	11,282	11,914	12,644	13,684	14,687	15,244	15,728
Yucaipa Valley Water District	28,764	34,862	42,171	45,627	49,602	54,985	60,435	64,228	67,844
Yucaipa Valley Water District - San Bernardino County Service Area			51,458	53,550	55,698	57,819	59,960	61,934	63,846
Yucaipa Valley Water District - Riverside County Service Area			7,308	8,659	10,279	12,297	14,739	17,803	21,153

The Yucaipa Valley Water District is located in one of the fastest growing areas of the United States. Based on California's 15 most-populous counties, San Bernardino's growth rate of 20.5 percent to 1.7 million people was topped only by Riverside County, which grew the fastest.



Section 3

Water System Demands

3.1 Baselines and Targets

An urban retail water supplier shall include in its urban water management plan due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data (10608.20(e)).

There are several steps required for developing the SBX7-7 water conservation goals. The following methodology was used to determine the interim urban water use target and the 2020 compliance daily per capita water use.

Figure 3-1 - SBX7-7 Methodology Illustration

3.1.1 Determination of the Base Daily per Capita Water Use

The Water Conservation Bill of 2009 requires each urban water retail water supplier to include in its Urban Water Management Plan an estimate of base daily per capita water use. Base daily per capita water use, measured in gallons per capita per day (GPCD) is established for an initial period of time, which is referred to as the 10- to 15-year base period.

Three technical methodologies have been developed to support a water supplier in determining its base daily per capita water use:

- Technical Methodology 1: Gross Water Use
- Technical Methodology 2: Service Area Population
- Technical Methodology 3: Base Daily Per Capita Water Use

The following figure has been prepared by the Department of Water Resources as a guide for developing water conservation goals.

The Yucaipa Valley Water District has elected to utilize Technical Methodology 2: Service Area Population to assist in the calculations to determine the base daily per capita water use.

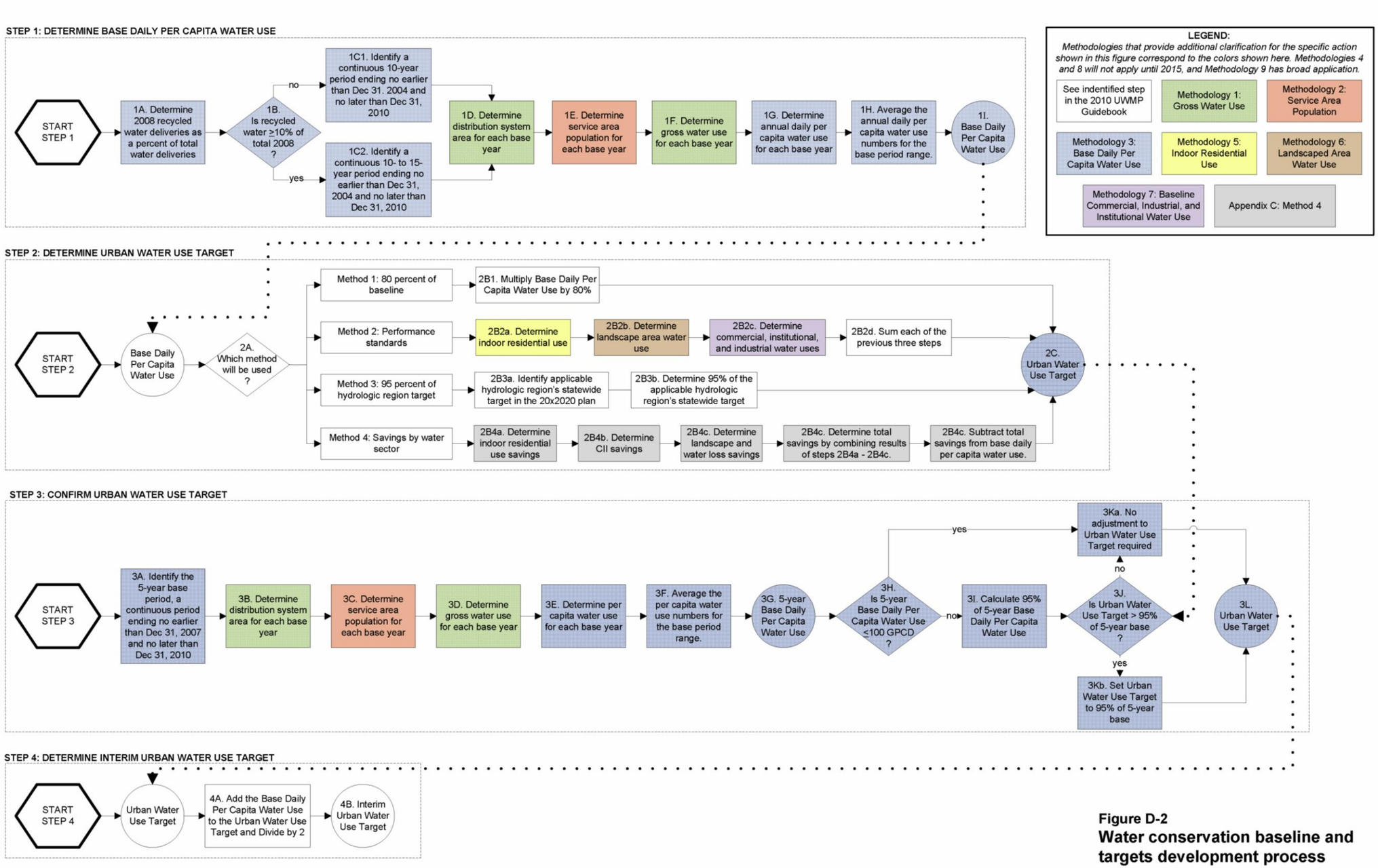


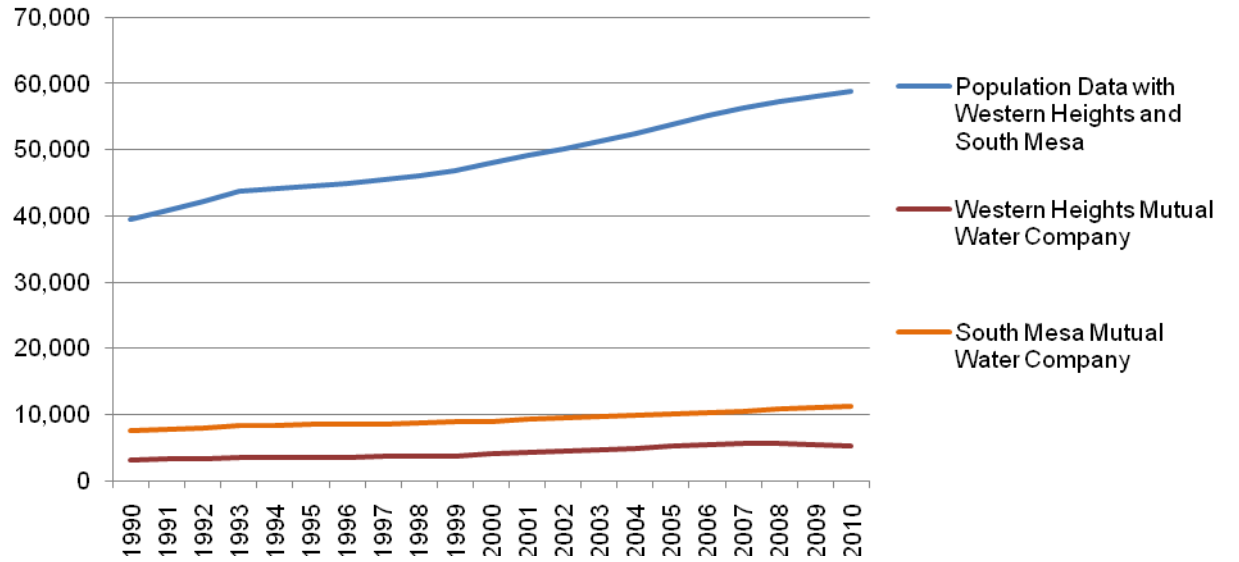
Figure D-2
Water conservation baseline and targets development process

Figure 3-2: Water Conservation Baseline and Targets Development Process

The population calculations for the Yucaipa Valley Water District were determined using data published from the California Department of Finance and the U.S. Census Bureau. Years with population estimates that did not provide a reasonable trend were adjusted to reflect an overall increasing population trend for the Yucaipa Valley Water District's service area. The District's service area boundary falls within Category 2 of the Department of Water Resources three scenarios of potential boundary characteristics. Category 2 is described as water suppliers whose actual distribution area *does not* overlap substantially (≥95%) with city boundaries but has Geographic Information System maps of their distribution area. The service area population was further refined using a geographical information system coupled with additional local population resources provided by the Southern California Association of Governments (SCAG). SCAG is the largest Metropolitan Planning Organization (MPO) in the United States. As the designated MPO, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.

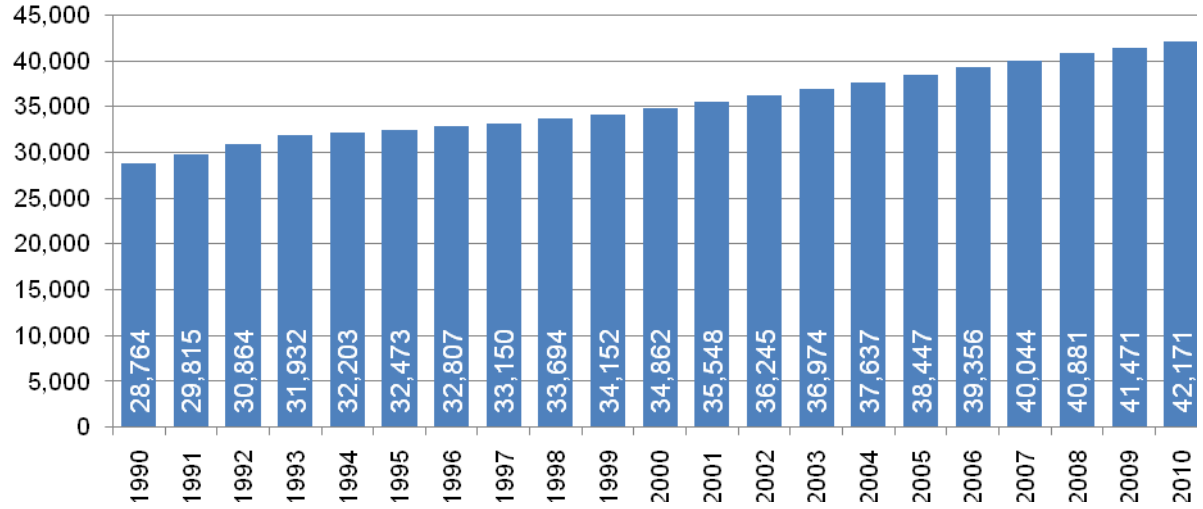
The first step for calculating the service area population of the Yucaipa Valley Water District was to determine the population of the entire service area. The population data was then further refined to determine the population of the service areas for Western Heights Mutual Water Company and South Mesa Mutual Water Company.

Figure 3-3 - Annual Population Calculations for Yucaipa Valley Water District



The difference between the total population of the Yucaipa Valley Water District service area and the population figures for Western Heights Mutual Water Company (red line) and South Mesa Mutual Water Company (orange line) provides the population of the area served by the Yucaipa Valley Water District.

Figure 3-4 - Population Served by Yucaipa Valley Water District from 1990 to 2010



In addition the City of Calimesa and the City of Yucaipa provided population projections for the years 2020, 2030, 2040, and 2050. It is assumed that these projections include the portions of the unincorporated County areas that lie in the District's sphere of influence.

3.1.2 Determination of Urban Water Use Target

The water supplier has four different methods to be considered for determining the urban water use target. Methods 1 through 3 were established by the Legislature in the Water Conservation Bill of 2009. Urban Water Use Target Method 4 was subsequently prepared by the California Department of Water Resources and an advisory committee according to the requirements provided in California Water Code Section 10608.20(b)(4). The four methods for determining urban water use targets are:

- Method 1: 80% of base daily per Capita Water Use
- Method 2: Performance Standards
- Method 3: 95% of Regional Target
- Method 4: Water Savings

During the preparation of this document, all of the four methods were examined in order to determine the most appropriate gallons per capita per day water reduction for Yucaipa Valley Water District. Method 1 became the most feasible method to achieve the 20% water reduction by 2020. The current baseline is 291.38 gpcd resulting in a water use target of 233.10 gpcd.

3.1.3 Regional Alliance

The baseline targets for Yucaipa Valley Water District were developed individually however these targets will be incorporated into the Regional Urban Water Management Plan coordinated by San Bernardino Valley Municipal Water District. Participants in this plan include the City of Colton, the City of Loma Linda, the City of Redlands, San Bernardino Municipal Water Department, East Valley Water District, and West Valley Water District. The San Bernardino Regional Alliance met quarterly beginning in March 2010. The quarterly meetings were used to identify and define the new Urban Water Management Plan requirements along with

determination of Demand Management Measures that are consistent among several agencies in order to reduce duplication of efforts.

Table 3-1 – Base Period Ranges

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	4,583	*see below*
	2008 total volume of delivered recycled water	390.141	*see below*
	2008 recycled water as a percent of total deliveries	8.5	percent
	Number of years in base period	10	years
	Year beginning base period range	2000	
	Year ending base period range	2009	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2005	
	Year ending base period range	2009	

Units in the table above are in million gallons.

The following table provides data for the base daily per capita water use over a ten year period, from 2000 to 2010.

During this period the base daily per capita water use was 291.38.

Table 3-2 - Base Daily Per Capita Water Use - Ten Year Range

Base period year		Distribution System Population	Daily System Gross Water Use (million gallons)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2000	34,862	9,204,411	264.02
Year 2	2001	35,548	9,298,082	261.56
Year 3	2002	36,245	10,486,548	289.32
Year 4	2003	36,974	9,803,014	265.13
Year 5	2004	37,637	11,465,808	304.64
Year 6	2005	38,447	11,204,822	291.44
Year 7	2006	39,356	12,135,534	308.35
Year 8	2007	40,044	13,198,822	329.61
Year 9	2008	40,881	12,557,945	307.18
Year 10	2009	41,471	12,131,013	292.52
			Base Daily Per Capita Water Use	**291.38**

The following table illustrates the per capita water use for a five year period from 2005 to 2009.

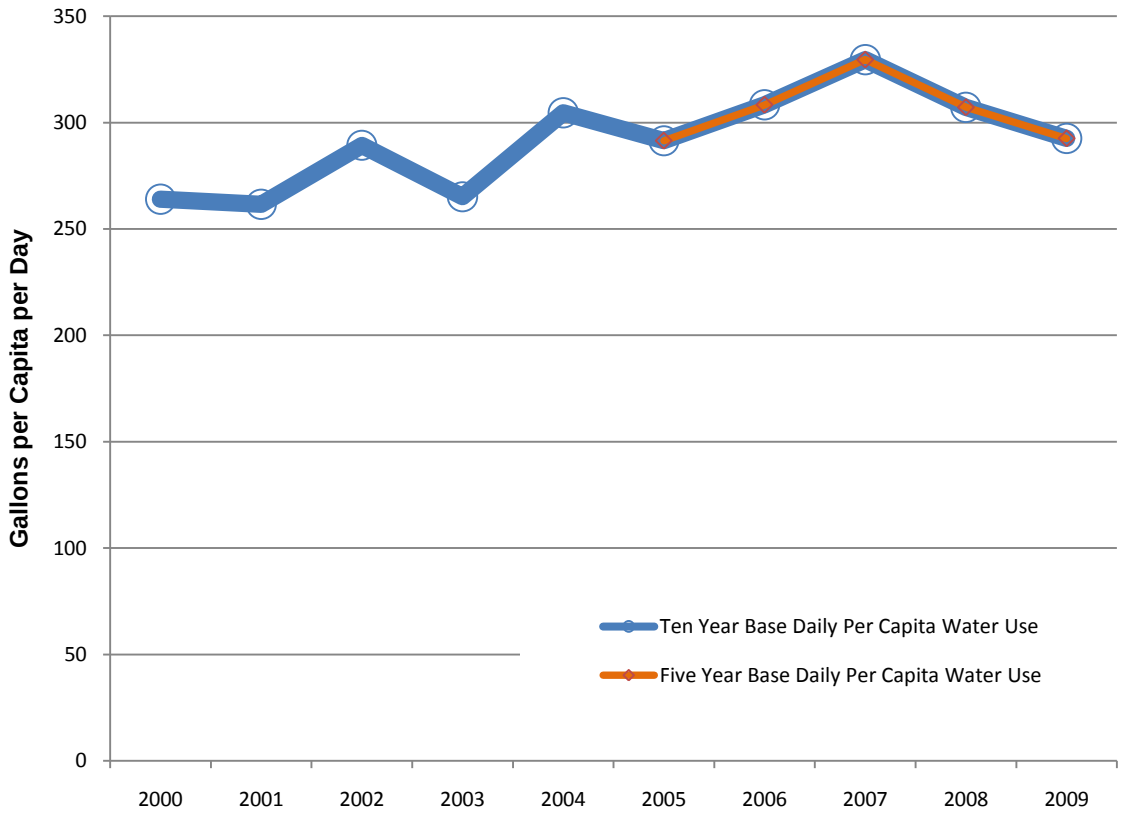
During this period the base daily per capita water use was 305.82.

Table 3-3 - Base Daily Per Capita Water Use - Five Year Range

Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2005	38,447	11,204,822	291.44
Year 2	2006	39,356	12,135,534	308.35
Year 3	2007	40,044	13,198,822	329.61
Year 4	2008	40,881	12,557,945	307.18
Year 5	2009	41,471	12,131,014	292.52
		Base Daily Per Capita Water Use		305.82

The following figure provides a graphical representation of Table 3-2 and Table 3-3.

Figure 3-5 - Daily Per Capita Water Use, 5 and 10 year Periods



3.2 Water Demands

Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (California Water Code Section 10631(k)).

Table 3-4 - Actual Water Deliveries for 2000, 2005 & 2010

Water Use Sectors	2000 Customer Accounts Metered		2005 Customer Accounts Metered		2010 Customer Accounts Metered	
	Number of Accounts	Volume	Number of Accounts	Volume	Number of Accounts	Volume
Single family	8,144	2,354.4	10,900	2,651.9	11,044	2,451.9
Multi-family	438	511.4	523	326.0	518	399.3
Commercial/Institutional	212	146.9	262	156.6	279	153.4
Industrial	17	57.8	21	12.2	15	26.5
Landscape	46	241.4	129	521.6	165	551.3
Agriculture*	2	6.8	2	4.0	2	7.2
Other*	62	39.0	144	73.0	103	115.9
Total	**11,979**	**3,357.7**	**11,979**	**3,745.3**	**12,126**	**3,705.5**

Notes:

- *The volumetric units on this table are million gallons.*
- *Data for this table is from the DWR Public Water System Statistics Reports.*
- ** Reflects recycled water from the Wochholz Regional Water Recycling Facility or the Yucaipa Valley Regional Water Filtration Facility.*

The following chart illustrates the distribution of water customer classifications for the Yucaipa Valley Water District. In 2010, the Yucaipa Valley Water District had the following distribution of water customers:

- 91.2% - Single family water customers;
- 4.3% - Multi-family water customers;
- 2.3% Commercial/Institutional water customers;
- 0.1% Industrial water customers;
- 1.4% Landscape irrigation customers; and
- 0.8% Other classified water customers.

Figure 3-6 - Customer Classifications for 2000, 2005 and 2010

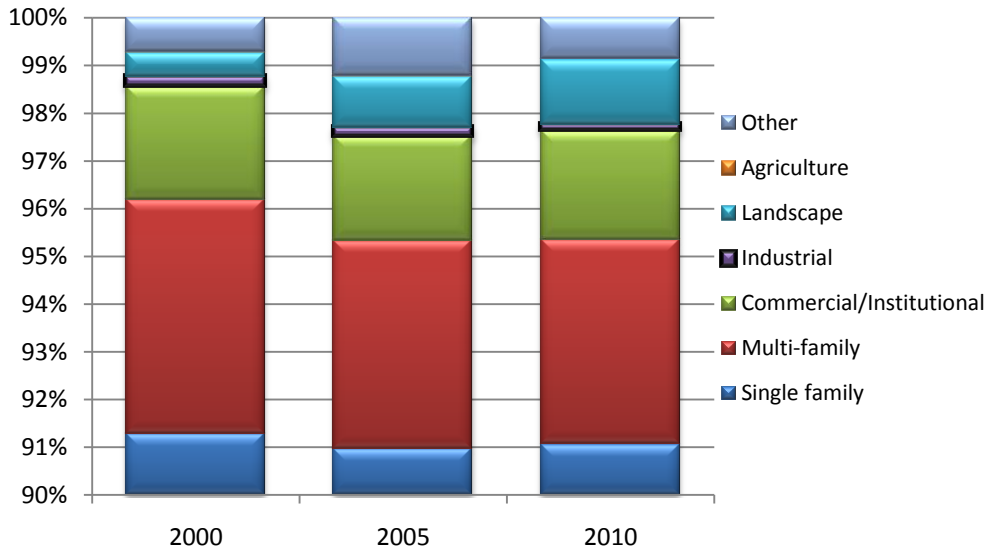


Table 3-5 Projected Calendar Year Water Deliveries for 2015, 2020 and 2025

Water Use Sectors	2015 Customer Accounts Metered		2020 Customer Accounts Metered		2025 Customer Accounts Metered	
	Number of Accounts	Volume	Number of Accounts	Volume	Number of Accounts	Volume
Single family	12,798	3,060.331	14,817	3,193.580	17,583	3,339.879
Multi-family	613	471.626	709	492.161	842	514.707
Commercial/Institutional	322	189.108	373	197.342	443	206.382
Industrial	19	32.206	22	32.565	26	34.056
Landscape	147	583.730	170	609.145	201	637.051
Agriculture*	2	5.217	2	5.365	2	5.294
Other*	132	87.394	153	91.199	182	95.377
Total	**14,033**	**4,428.613**	**16,247**	**4,621.357**	**19,279**	**4,832.747**

Notes:

- *The volumetric units on this table are million gallons.*
- ** Reflects recycled water from the Wochholz Regional Water Recycling Facility.*

Table 3-6 Projected Calendar Year Water Deliveries for 2030, 2035 and 2040

Water Use Sectors	2030 Customer Accounts Metered		2035 Customer Accounts Metered		2040 Customer Accounts Metered	
	Number of Accounts	Volume	Number of Accounts	Volume	Number of Accounts	Volume
Single family	20,353	3,501.934	22,198	3,680.064	23,929	3,866.076
Multi-family	974	539.681	1,063	567.133	1,145	595.799
Commercial/Institutional	512	216.396	559	227.404	602	238.898
Industrial	31	35.709	33	37.525	36	39.422
Landscape	233	667.961	254	701.938	274	737.418
Agriculture*	2	5.337	2	5.318	2	5.327
Other*	210	100.005	229	105.092	247	110.404
Total	**22,316**	**5,067.024**	**24,338**	**5,324.474**	**26,234**	**5,736.529**

Notes:

- *The volumetric units on this table are million gallons.*
- ** Reflects recycled water from the Wochholz Regional Water Recycling Facility.*

Figure 3-7 - Projected Water Customer Classifications

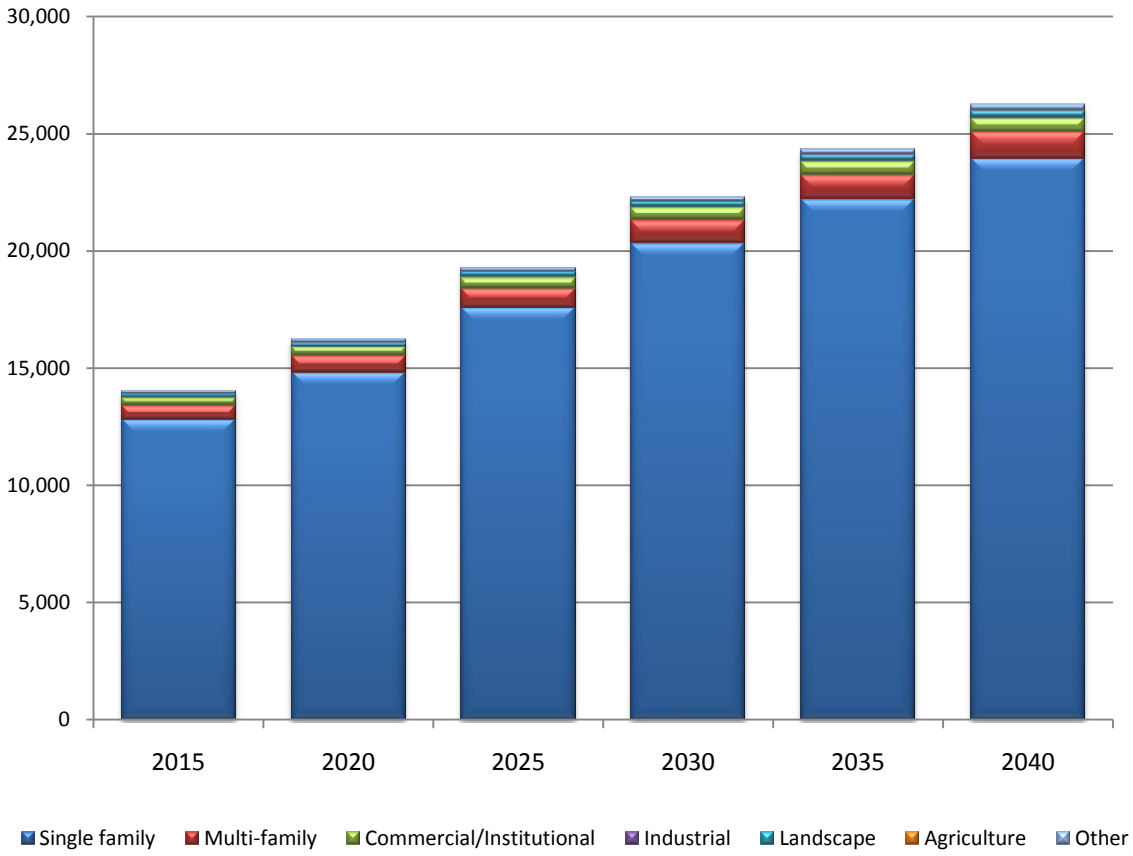


Table 3-7 – Sales To Other Water Agencies

Water Sales Information	2005	2010	2015	2020	2025	2030	2035
Western Heights Mutual Water Co.	0.000	51.390	144.946	143.548	143.175	143.184	143.185

Others	0	0	0	0	0	0	0
Total	0.000	51.390	144.946	143.548	143.175	143.184	143.185

Units in million gallons per year.

Table 3-8 – Additional Water Uses and Losses

Description	2005	2010	2015	2020	2025	2030	2035
Water Use [1]	3,745.300	3,706.500	4,428.613	4,621.357	4,832.747	5,067.024	5,324.474
Saline Barriers	0	0	0	0	0	0	0
Groundwater Recharge	0	1,500.578	1,630.000	1,711.500	1,793.000	1,793.000	1,793.000
Conjunctive Use[2]	0	299.920	326.000	356.318	387.288	422.170	459.986
Recycled Water	0	340.996	517.036	709.050	921.276	1,155.344	1,412.232
System Losses	0	196.904	114.100	118.338	116.056	112.796	107.580
Others	0	0	0	0	0	0	0
Total	3,745.300	6,044.898	7,015.749	7,516.563	8,050.367	8,550.334	9,097.272

Units in million gallons per year. [2] YVWD's service area covers San Bernardino County and Riverside County requiring purchase of SWP water from two wholesalers.

Table 3.9– Total Water Use

Description	2005	2010	2015	2020	2025	2030	2035
Total Water Deliveries	3,745.300	3,706.500	4,428.613	4,621.357	4,832.747	5,067.024	5,324.474
Sales to Other Water Agencies	0.000	51.390	144.946	143.548	143.175	143.184	143.185
Additional Water Uses and Losses	0.00	2,338.400	2,587.140	2,895.210	3,217.620	3,483.310	3,772.800
Total	3745.300	6096.290	7160.699	7660.115	8193.542	8693.518	9240.459

Units in million gallons per year.

3.2.1 Technical and Economic Feasibility of Projected Water Uses

Over the past two decades, the Yucaipa Valley Water District has been actively taking steps to improve the social, economic and environmental sustainability of our community. These actions have included the purchase of valuable watershed properties, protection of local water supplies and management of environmental corridors. While the decisions to embark on these actions have been generally unrelated, a look back in time indicates that the District has been progressing towards a more independent, flexible and sustainable future.

The proactive steps taken by the District to protect and conserve our resources have been based on the concepts that: (1) resources are not limitless and therefore need to be conserved, nurtured and renewed; and (2) resources that are used to generate short-term gains result in an inefficient and inequitable consumption of resources that are not beneficial for a long-term strategy. Both of

these concepts help to guide the District to make decisions that are conservative, careful and conscious of the role we currently play in a long-term strategy to protect the community.

On August 20, 2008, the Board of Directors adopted A Strategic Plan for a Sustainable Future - The Integration and Preservation of Resources. The development of this document was based upon suggestions from the board members, staff, the public and interested stakeholders. We appreciated the constructive feedback we received to begin our journey of a sustainable future for our community.

The purpose of pursuing a strategic plan for a sustainable future is twofold.

- First and foremost, the sustainability plan has been designed to establish the policies and guidelines necessary to protect and preserve the natural resources entrusted to the District for our customers. It is our business to maximize the use of our limited natural resources for the long-term economic growth and expansion of the local economy. In the arid southwest, the basic fuel to create and maintain a local economy is water.
- Secondly, the sustainability policy has been designed to provide a means to measure performance of the organization. While performance monitoring or benchmarking is not normally associated with sustainability, this document has been created with the intention that the goals and reporting requirements are designed around performance management across a wide range of disciplines.

The Yucaipa Valley Water District projected water use scenarios described in this Urban Water Management Plan represent viable options for the Districts future water use based on planning documents and projected water needs. A series of projects have already been implemented throughout the District and others planned as part of the annual Capital Improvement Budget adopted by the Yucaipa Valley Water District Board of Directors each year.

The most important projects identified by the District to address future water use would be the implementation of dual recycled water plumbing for new developments. This program is technically achievable and economically feasible due to the balance of new development water fees for constructing these facilities.

3.2.2 Describe Potential for Water Use Targets to be Implemented

Based on the strategic planning already adopted by the Yucaipa Valley Water District Board of Directors, the District is confident that the water use targets will be successfully implemented. One of the most important components of the strategic planning documents is the adopted prioritization of water to ensure the Yucaipa Valley Water District does not provide an opportunity for new development if water supplies are not readily available. The priorities for water supply are as follows:

- Priority One – Direct Delivery for Existing Customers. The direct delivery of imported water to meet the needs of existing potable water and non-potable water demands will be the highest priority of the District. This priority ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the existing direct delivery demand, imported water will be allocated to the next priority.

- Priority Two – Groundwater Adjudication Obligations. The District is responsible for meeting the obligations of groundwater adjudications in the Beaumont and Yucaipa Basins. This is the second highest priority to ensure sufficient storage and

replenishment obligations under court orders have been achieved. This priority also ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the first and second priorities, imported water will be allocated to the following priority.

- Priority Three – Groundwater Banking for Future Reliability. The Board of Directors will establish a groundwater banking of 15% of the total water used by District customers to recover our groundwater basins for future reliability. Each month, customers will be charged the cost for importing an additional 15% of the water consumed. The water will be stored in the groundwater basins to establish a credit and future drinking water supply to allow the community to use this local source during times of droughts and disruptions to the State Water Project. As with the first two priorities, this third priority also ensures sufficient water supply is allocated to meet current water demands, and is different from the Parcel Development Process needed for new development to occur. If the available supply of imported water exceeds the first, second and third priorities, imported water will be allocated to the following priority.

- Priority Four – Parcel Development Process. The Parcel Development Process provides for the storage of 7.0 acre feet per EDU for all new developments and 15.68 acre feet per EDU of imported water for the Crystal Status Development Program. This water is sufficient to clearly demonstrate a 20 year supply of water is available for the development to occur. The cost of imported supplemental water will be linked directly to the availability and anticipated cost for water delivered by either the San Bernardino Valley Municipal Water District or the San Gorgonio Pass Water Agency as established by the Yucaipa Valley Water District.

Based on this strategy, new development will contribute to the capital assets of the District as well as the water supply strategy to ensure a long-term and reliable water supply is available. This strategy allows the District to serve its customer's water demands entirely through groundwater or surface water allowing the District to insulate itself from periodic drought by utilizing available surface waters in wetter years relying more on groundwater in dryer years when surface water is less available. The District is able to switch between the two sources, or use both sources simultaneously, depending on hydrology and water availability.

Surface supply availability from the SWP, San Bernardino Basin Bunker Hill Pressure Zone, Seven Oaks Dam, Mill Creek and Santa Ana River can be used interchangeably, depending upon local and statewide hydrology, to supplement a stable local groundwater yield. Additionally, the District will incorporate recycled water delivery systems into new development, focusing service of new irrigation demands on recycled water. Recycled water will give the District a new local source of water of high reliability, both lessening the dependence on imported sources and increasing reliability of total supply. Overall, there are sufficient water resources to meet its current and projected growth in demands.

3.2.3 Low Income Projected Water Demands

The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier (10631.1(a)).

As discussed above, the Yucaipa Valley Water District is confident that the water use targets established within this plan are achievable for all classes of customers. The water use projections also are applicable for single-family and multifamily residential housing needed for lower income households.

On November 7, 2007, the Yucaipa Valley Water District adopted Resolution No. 16-2007 that establishes policies and procedures for providing priority water and sewer service to affordable housing projects pursuant to California Government Code Section 65589.7. This Resolution provided the following:

1. Based upon availability of water and sewer service, as determined by the General Manager, the District will, to the extent reasonably feasible, grant priority to proposed developments that include housing units affordable to lower income households, as defined in Government Code Section 65589.7(d).

2. The District will devote its best efforts to plan and provide for water service and sewer connections for proposed developments that include housing units affordable to lower income households, taking into account (i) the housing element of the general plan adopted by each county or city within the District's boundaries, and (ii) other plans, documents, and information that provide a reasonable basis for making service determinations.

3. Applications for proposed developments that include housing units affordable to lower income households shall not be denied, nor shall conditions be imposed thereon or services which are applied for be reduced, unless the District makes specific written findings that the denial, condition, or reduction is necessary due to the existence of one or more of the following:

    a. Insufficient water supply or insufficient water treatment or distribution capacity;

    b. A State Department of Health Services order prohibiting new water connections;

    c. Insufficient sewer treatment or collection capacity;

    d. A Regional Water Quality Control Board order prohibiting new sewer connections; or

    e. The applicant has failed to agree to reasonable terms and conditions relating to the provision of service.

4. The District shall not discriminate in any manner when processing and considering requests for water or sewer service for developments that include housing units affordable to lower income households.

5. On or before July 1, 2011, and at least every five (5) years thereafter, the District shall adopt new or revised written policies and procedures, if necessary, with specific objective standards for the provision of water or sewer service on a priority basis with respect to developments that include housing units affordable to lower income households.

As part of the Urban Water Management Plan, the Yucaipa Valley Water District estimates the following lower income projections for water use.

Table 3-10 Low Income Water Use Projections

Description	2010	2015	2020	2025	2030	2035
Estimated Very Low and Low-Income Households Water Use	293.400	332.520	371.640	410.760	441.143	293.400

Senate Bill 1087 requires that water use projections of an Urban Water Management Plan include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The Yucaipa Valley Water District contains three primary jurisdictions that have been included in this planning process, the City of Yucaipa and the City of Calimesa, and unincorporated County of San Bernardino.

3.2.3.1 City of Yucaipa

The City of Yucaipa revised their Housing Element in November 2008. The City of Yucaipa's Housing Needs Assessment utilizes data from the 2000 U.S. Census, California Department of Finance (DOF), California Employment Development Department (EDD), Southern California Association of Governments (SCAG) and other relevant sources. Supplemental data was obtained through field surveys and from private vendors. A shortfall of lower-income sites compared to the City of Yucaipa's share of regional housing need was determined with the November 2008 Housing Element Study. The City of Yucaipa's Community Development Department will identify and rezone a minimum of 59 acres for multi-family development "as-of-right" at a density of 20-24 units/acre (excluding any density bonus) to bridge this gap. Rezoned sites will have a capacity of at least 16 units.

In 2000, approximately 1,835 extremely-low-income households resided in Yucaipa, representing 12.1% of the total households. The projected housing need for extremely-low-income households is assumed to be 50% of the very-low-income regional housing need of 476 units. As a result, the City has a projected need for 238 extremely-low-income units. The Yucaipa Valley Water District has determined approximately 80% of the City of Yucaipa's low income households fall within the service area of the Yucaipa Valley Water District. The remaining low income households will be located in service areas of South Mesa Mutual Water Company or Western Heights Mutual Water Company (Yucaipa Housing Element, November 2008).

3.2.3.2 City of Calimesa

Using these definitions, the Southern California Association of Governments (SCAG) estimated the distribution of City of Calimesa households by income category in the course of developing its Regional Housing Needs Assessment. SCAG's estimates indicate that the City of Calimesa's population is predominantly low and moderate income. This is further supported by

a citywide household income survey conducted by the City of Calimesa in 2004, which was funded by a CDBG Planning and Technical Assistance Grant that documented approximately 55 percent of the City's households as being lower income (i.e., low income, very low income and extremely low income).

Lower income households, in general, present a special housing need. These households are least able to afford increases in housing costs without sacrificing the purchase of food, medicine, clothing, or other essentials. Lower income households are also less likely to have funds available for home improvements, repairs, and maintenance (City of Calimesa, Housing Element 2006-2014). The Yucaipa Valley Water District has determined approximately 60% of Calimesa's Low Income Households fall within the service area of the Yucaipa Valley Water District. The remaining low income households will be located in the service area of the South Mesa Mutual Water Company.

3.3 Water Demand Projections

> *Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c) (California Water Code Section 10631(k)).*

The Yucaipa Valley Water District receives imported water from the San Bernardino Valley Municipal Water District and the San Gorgonio Pass Water Agency. During the development of the Urban Water Management Plan, the Yucaipa Valley Water District worked closely with both wholesale agencies to develop their regional plans as well as supplement the Yucaipa Valley Water District's Plan.

Table 3-11 - State Water Contractors Serving Yucaipa Valley Water District

Description	San Bernardino Valley Municipal Water District	San Gorgonio Pass Water Agency
Formation Date	February 17, 1954	1961
Size of Service Area	325 square miles	225 square miles
Governing Act	Municipal Water District Act of 1911 - California Water Code Sections 71000	San Gorgonio Pass Water Agency Act, California Water Code Chapter 101
Maximum Annual State Water Project Entitlement	102,600 Acre Feet	17,300 Acre Feet
Number of Board Members	Five	Seven

Figure 3-6 – Delineation of Wholesale Service Areas for the Yucaipa Valley Water District

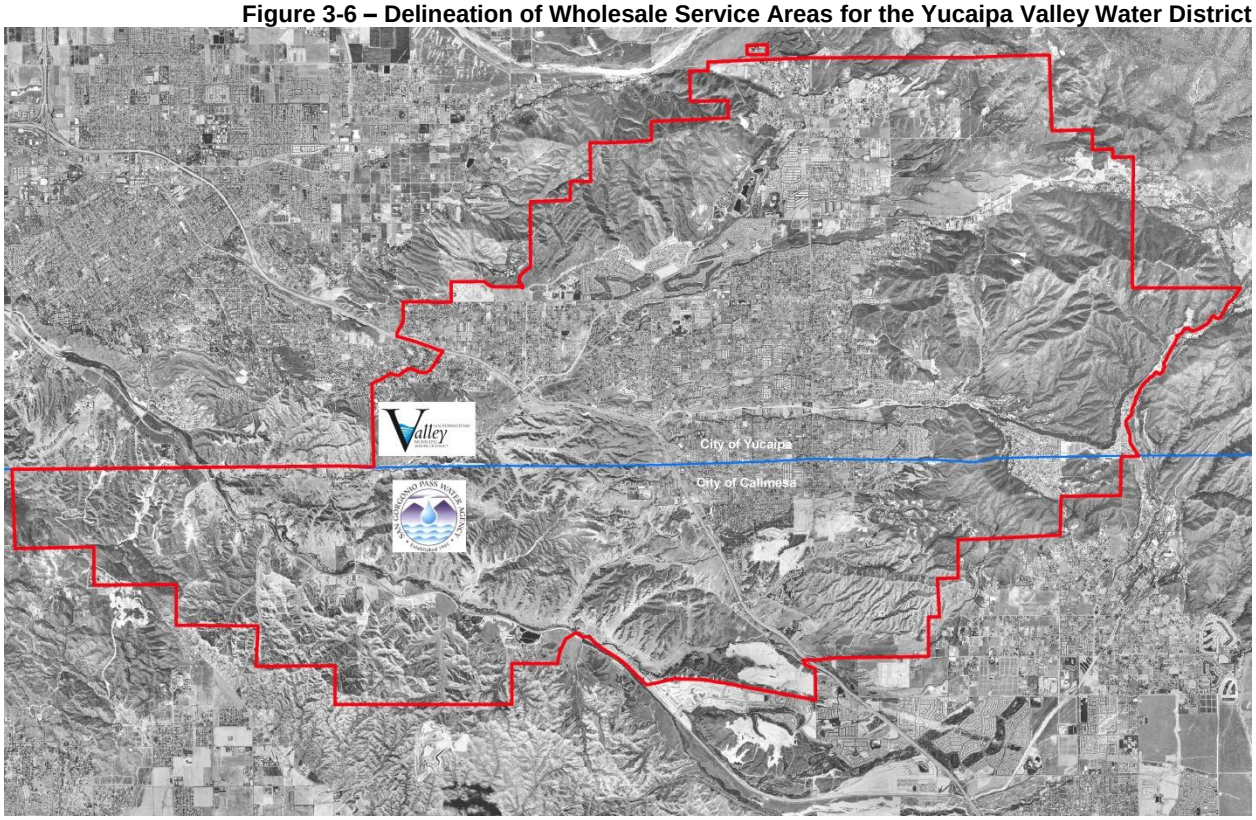


Table 3-12 – YVWD Demand Projections Provided to Wholesale Supplier San Bernardino Valley Municipal Water District

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	1,800.0	1,906.9	2,016.7	2,125.0	2,234.5	2,335.3
Conjunctive Use Demands: Local Water Banking	270.0	286.0	302.5	318.8	335.2	350.3
New Development Long-Term Supply Sustainability Program	43.3	391.0	381.0	396.0	356.0	368.0
Total	2,113.3	2,583.9	2,700.2	2,839.8	2,925.7	3,053.6

Units in million gallons per year.

Table 3-13 – YVWD Demand Projections Provided to Wholesale Supplier San Gorgonio Pass Water Agency

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	200.0	269.0	351.8	454.9	579.7	736.3
Conjunctive Use Demands: Local Water Banking	30.0	40.4	52.8	68.2	87.0	110.4
New Development Long-Term Supply Sustainability Program	2.3	266.0	333.0	398.0	503.0	607.0
Total	232.3	575.4	737.6	921.1	1,169.7	1,453.7

Units in million gallons per year.

3.4 Water Use Reduction Plan

Urban wholesale water suppliers shall include in the urban water management plans … an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part (10608.36). Urban retail water suppliers are to prepare a plan for implementing the Water Conservation Bill of 2009 requirements and conduct a public meeting which includes consideration of economic impacts (California Water Code Section 10608.26).

3.4.1 Recycled Water

Recycled water demands currently comprise approximately 8.5 percent of the District's overall water demand. As documented within the Yucaipa Valley Water District Water Master Plan dated April 2002, the majority of the increase in the District's projected future water demands are for irrigation or other recycled uses. Water to serve such recycled demands does not need to be treated to the same standards as drinking water supplies since this demand is usually satisfied with recycled water.

To serve the projected growing recycled water demand, the Yucaipa Valley Water District has implemented an extensive dual water distribution system. The dual water system includes a potable water conveyance system to convey potable water (treated to comply with drinking water standards) to potable water customers. A separate recycled water distribution system conveys recycled supplies (treated to comply with body-contact and irrigation water standards) to recycled customers. Recycled water sources available to the Yucaipa Valley Water District include:

- Untreated imported water or untreated local surface water supplies;
- Backwash water from Yucaipa Valley Regional Filtration Facility; and
- Recycled water treated at the Henry N. Wochholz Regional Water Recycling Facility

The Yucaipa Valley Water District's recycled water distribution system serves commercial and institutional customers. The current recycled system extends westward from the Wochholz Regional Wastewater Recycling Facility to Crafton Hills College and southward to L Avenue in Yucaipa. The District's recycled water master plans envision expansion of the recycled water distribution system to serve the region's growing recycled water demand.

Anticipated growth will benefit from the recycled water distribution system. Yucaipa Valley Water District has adopted guidelines requiring dual plumbed systems on home lots equal to or exceeding 8,000 square feet.

3.4.2 Public Outreach

Yucaipa Valley Water District has an extensive public outreach campaign to inform and educate the community about water conservation. Successful water reduction throughout our service area can be achieved through proactive and invariable education opportunities for all members of the community.

The Yucaipa Valley Water District's Resource Sustainability Manager who oversees the multi-faceted public outreach program which consists of the following primary components:

Tours of District Facilities

- Yucaipa Valley Regional Water Filtration Facility – This facility tour informs attendees of YVWD's water source, water filtration process and the current water supply hurdles the District is currently facing and will face in the future. The tour also describes current and future water recycling methods necessary to ensure the growing community has an ample supply of water.
- Henry N. Wochholz Regional Water Recycling Facility – This facility tour describes the extensive treatment process of the community's wastewater. The tour also describes current and future water recycling methods necessary to ensure the growing community has an ample supply of water.

Classroom and Community Education Outreach

- YVWD partners with the Inland Empire Resource Conservation District (IERCD) to deliver multi-faceted education programs within the schools, grades K-12. IERCD conducts hands-on classroom presentations related to water conservation in order to expose students to California's water challenges and the process it takes for Southern California to obtain water for an arid environment.
- YVWD also participates in community events that have a substantial amount of residents in attendance. This participation gives YVWD a chance to inform a component of the community about the importance of residential water conservation.

3.4.3 Regional Collaboration

As a member of the San Bernardino Valley Municipal Water District's Regional Urban Water Management Plan, the Yucaipa Valley Water District routinely contributes toward the establishment of regional collaborative programs that benefit numerous water retailers in the Inland Empire Region. The regional alliance's water conservation programs consist of:

- Possible rebate programs for homeowners.
- Drought tolerant landscaping events and plant sales.
- Consistent messaging in the form of branding so consumers receive a dependable water conservation message.

Section 4

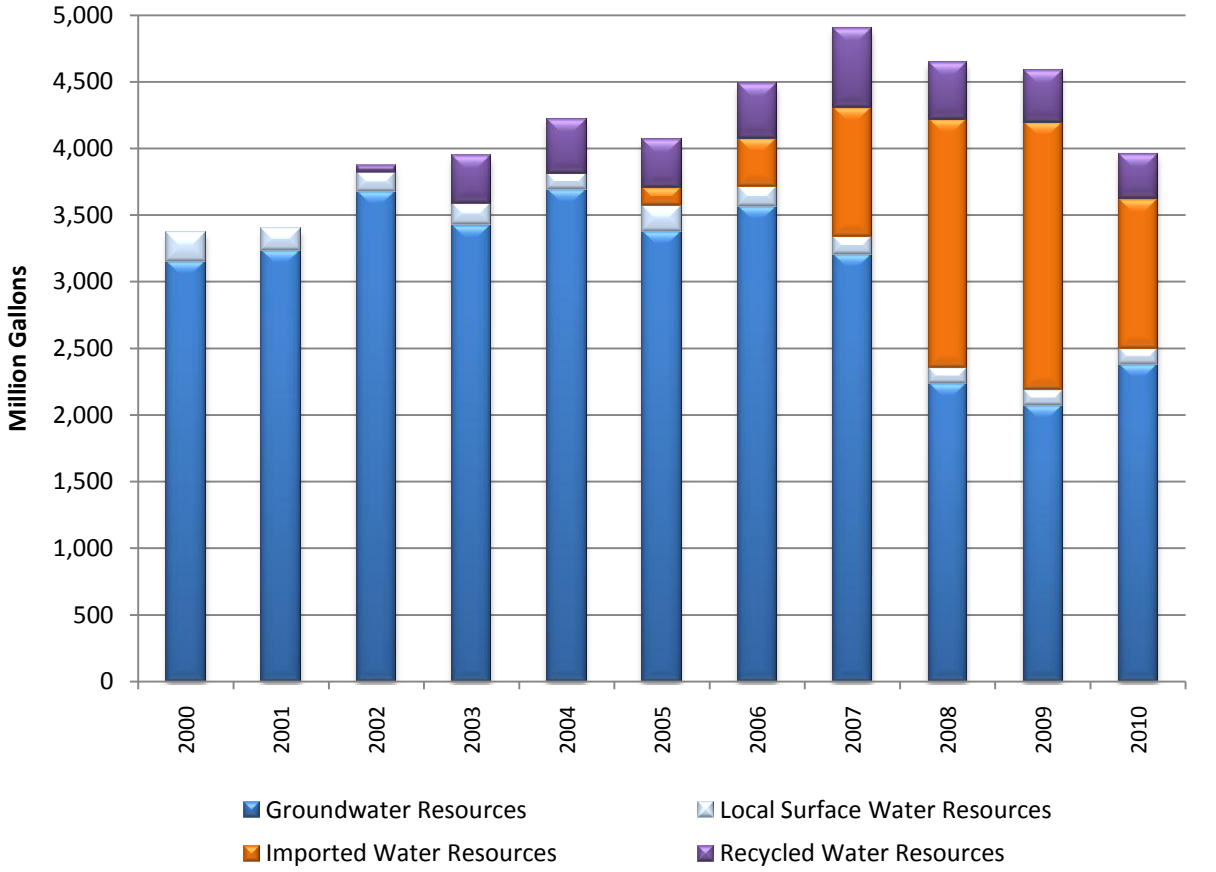
Water Sources and Supplies

4.1 - Water Resources

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments (California Water Code Section (a) (10631(b)).

The Yucaipa Valley Water District relies on four primary water resources to meet our annual water demands: groundwater resources, local surface water resources; imported water resources; and recycled water resources.

Figure 4-1 – Yucaipa Valley Water District Water Demand Sources



4.1.1 Groundwater Resources

The Yucaipa Valley Water District has traditionally met the bulk of service area customer needs from groundwater. However, as shown above, the reliance on over-drafted local groundwater supplies has shifted to other water resources in recent years.

In 2000, groundwater resources provided 93.7% of the total water demands of the Yucaipa Valley Water District. By 2010, this resource supplied 60.1% of the total water demands.

4.1.2 Local Surface Water Resources

The Yucaipa Valley Water District has operated and maintained surface water resources from the Oak Glen area since the early 1900's. The existing Oak Glen Surface Water Filtration Facility continues to produce a steady flow of high quality drinking water for the Yucaipa Valley.

In 2000, local surface water supplies provided 6.3% of the total water demands of the Yucaipa Valley Water District. By 2010, this source supplied 3.0% of total water demands.

4.1.3 Recycled Water Resources

In 2002, the Yucaipa Valley Water District started to provide non-potable water service to the Yucaipa Valley. This system started with the use of untreated imported water from the State Water Project and changed to a recycled water source as backwash water was treated at the Yucaipa Valley Regional Water Filtration Facility. By 2014, the Yucaipa Valley Water District will be utilizing recycled water from the Wochholz Regional Water Recycling Facility to meet the recycled water irrigation demands.

The recycled water system continues to grow with the addition of new infrastructure and new customers. In 2000, local recycled water resources were not utilized to meet the water demands of the Yucaipa Valley Water District. By 2010, this resource supplied 8.6% of the total water demands in the Yucaipa Valley.

4.1.4 Imported Water Resources

While the Yucaipa Valley Water District began to utilize imported water in 2002 to meet non-potable water demands, it was not until 2005 when the Yucaipa Valley Water District first operated a water filtration facility to produce drinking water from imported water resources delivered to the Yucaipa Valley Water District from the San Bernardino Valley Municipal Water District (which serves portions of the Yucaipa Valley Water District in San Bernardino County) and the San Gorgonio Pass Water Agency (which serves portions of the Yucaipa Valley Water District in Riverside County).

In 2000, imported water resources were not utilized to meet the water demands of the Yucaipa Valley Water District. By 2010, this resource supplied 28.2% of total water demands.

4.2 Planned Water Resources

The Yucaipa Valley Water District has adopted sustainability concepts that rely heavily on the use of recycled water to help meet the future water demands of the District. Additionally, the Yucaipa Valley Water District will carefully utilize imported water from the San Bernardino Valley

Municipal Water District and the San Gorgonio Pass Water Agency to establish groundwater banking programs and conjunctive use operations in the Yucaipa Valley. The aggressive use of recycled water and the carefully executed use of imported water will provide the Yucaipa Valley Water District with a long-term, reliable water supply for the future.

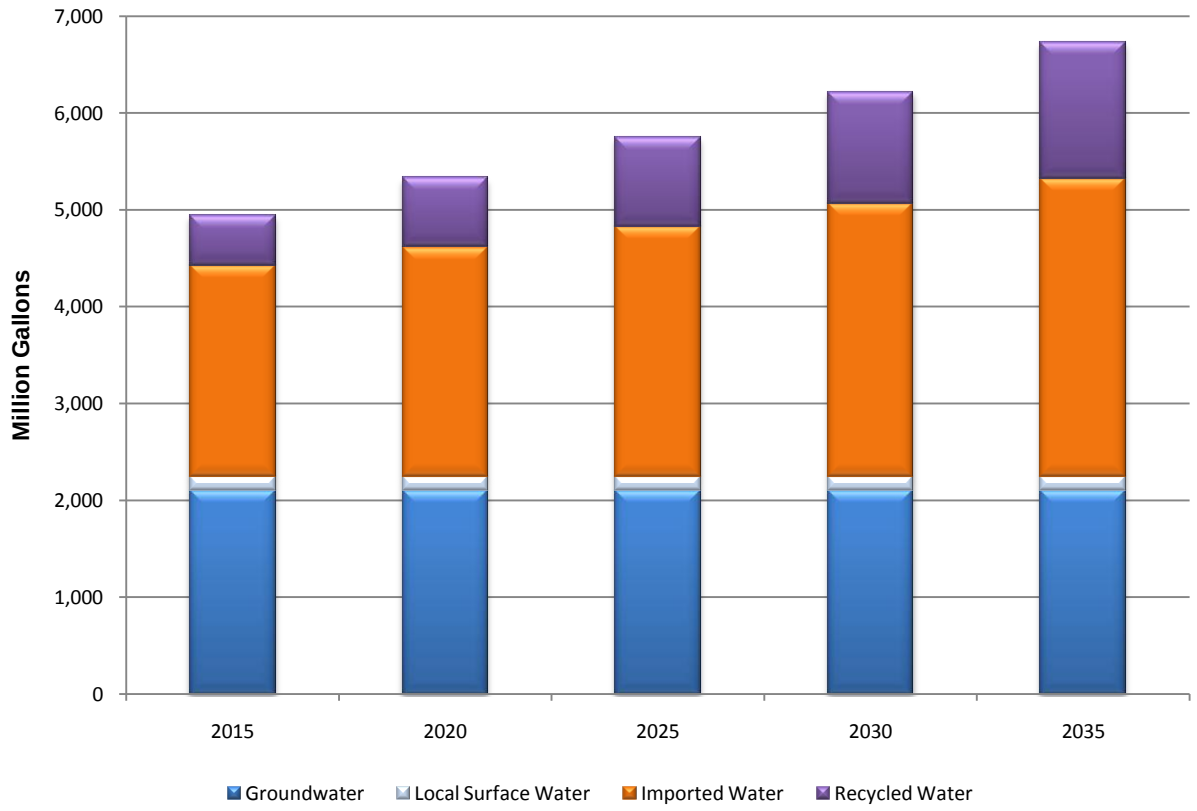
The Yucaipa Valley Water District envisions a long-term water supply that is based on an average of one-third groundwater resources, one-third recycled water resources, and one-third imported water resources. This water resource portfolio relies on the ability to recharge local groundwater basins during wet periods while increasing groundwater use during drought cycles. This concept is further discussed in the following sections of the Urban Water Management Plan.

Table 4-1 - Summary of Planned Water Resources

Water Source	2015	2020	2025	2030	2035
Groundwater Resources	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0
Local Surface Water Resources	147.5	147.5	147.5	147.5	147.5
Imported Water Resources	2,175.9	2,368.5	2,580.0	2,814.2	3,071.7
Recycled Water Resources	516.5	709.1	920.5	1,154.8	1,412.2
Total Water Resources	4,939.9	5,325.1	5,748.0	6,216.5	6,731.4

Units are in million gallons

Figure 4-2 - Yucaipa Valley Water District's Planned Water Resources



The following table illustrates the projected water supplies for the Yucaipa Valley Water District.

Table 4-2 - Detailed Current and Projected Water Supplies

Water Source	2010	2015	2020	2025	2030	2035
Groundwater Resources:						
Groundwater Extracted by YVWD	2,378.5	2,100.0	2,100.0	2,100.0	2,100.0	2,100.0
Local Surface Water Resources:						
Oak Glen Surface Water Filtration Facility	120.4	147.5	147.5	147.5	147.5	147.5
Imported Water Resources:						
San Bernardino Valley Municipal Water Dist.	1,500.9	1,906.9	2,016.7	2,125.0	2,234.5	2,335.3
San Gorgonio Pass Water Agency	40.1	269.0	351.8	455.0	579.7	736.3
Recycled Water Resources:						
YVRWFF Recycled Water Source	340.6	0.0	0.0	0.0	0.0	0.0
WRWRF Recycled Water Source	0.0	516.5	709.1	920.5	1,154.8	1,412.2
Transfers In	0.0	0.0	0.0	0.0	0.0	0.0
Exchanges In	0.0	0.0	0.0	0.0	0.0	0.0
Desalinated Drinking Water	0.0	0.0	0.0	0.0	0.0	0.0
Total Water Resources	3,957.3	4,939.9	5,325.1	5,748.0	6,216.5	6,731.3

Units are in million gallons

- *YVRWFF - The Yucaipa Valley Regional Water Filtration Facility produces treated backwash water that is currently used as a recycled water source.*
- *WRWRF - The Wochholz Regional Water Recycling Facility will produce advanced tertiary treated recycled water that will replace the recycled water currently produced by the Yucaipa Valley Regional Water Filtration Facility.*

4.3 Groundwater

> *Is groundwater . . . identified as an existing or planned source of water available to the supplier . . . (California Water Code Section 10631(b))*

The Yucaipa Valley Water District has traditionally met the bulk of service area customer needs from groundwater through the use of the Yucaipa Valley Water District's groundwater extraction wells. In 2010, over 75% of the groundwater used by the Yucaipa Valley Water District was extracted from the Wilson Creek Basin and the Calimesa Basin. The remaining groundwater production was from the Beaumont Basin, Chicken Hill Basin, Triple Falls Creek Basin, Oak Glen Basin and the Wildwood Basin.

> *Provide a detailed description and analysis of the location, amount and sufficiency of groundwater pumped b the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records. (California Water Code Section 10631(b)(3))*

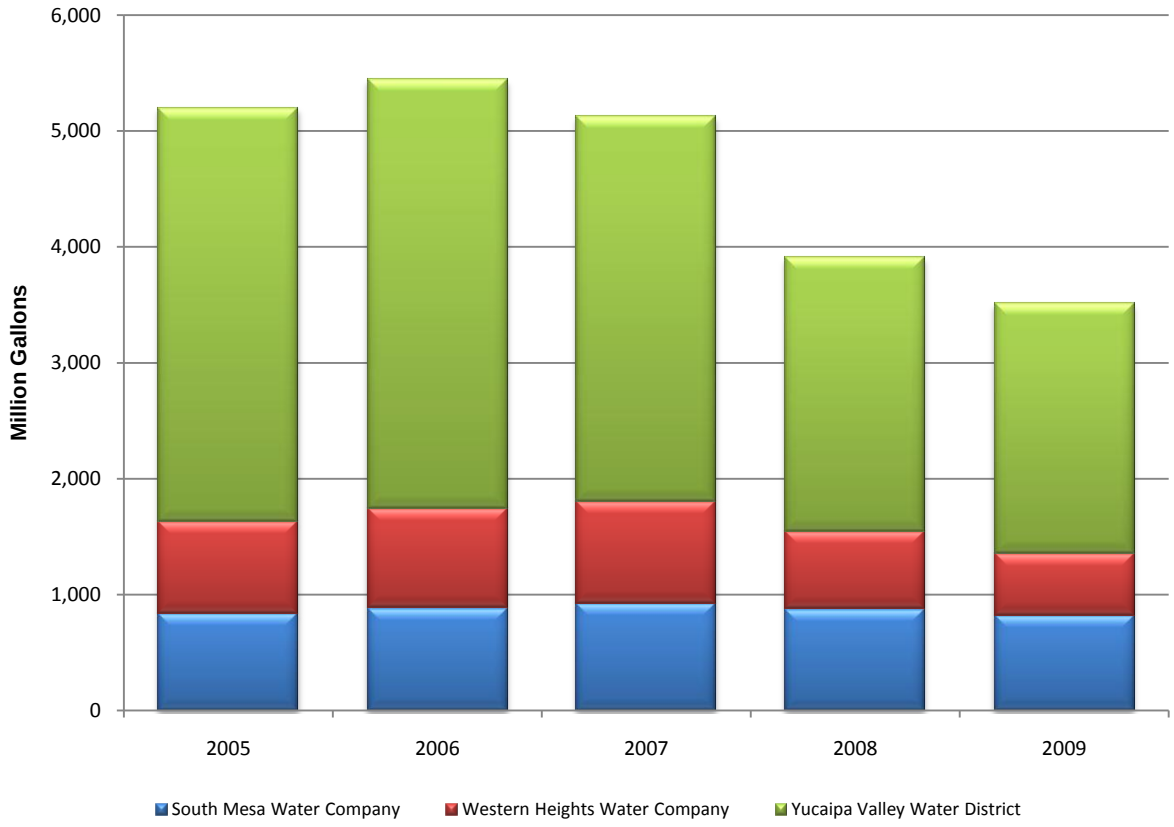
Since about 1970 and especially during the 1990's, the widespread urbanization of Southern California has extended into the Yucaipa area. Undeveloped land, agricultural land, and sparsely populated residential land has been converted into tracts of single family homes. The net effect of this change in land use has been an increase in the demand for water.

Since the local supply of surface water and groundwater is limited in this semi-arid region, water purveyors in the Yucaipa Valley have explored several alternatives related to the development of water resources in the area. Most studies have identified groundwater resources at 200-300

feet below the surface elevation with a general basin-wide movement of both surface water and groundwater from the surrounding hills and mountains, to the south and west. After a brief study of the area, it becomes apparent to most observers that on a localized scale, the movement of groundwater through the numerous faults is very complex.

The quantity and quality of groundwater in the area has generally been sufficient to meet the demands of the Yucaipa Valley over the past fifty years.

Figure 4-3 Appropriative Groundwater Extractions within the Yucaipa Valley Water District Sphere of Influence



The groundwater extractions by appropriators in the sphere of influence of the Yucaipa Valley Water District have decreased over the past five years. This is mainly attributed to the increased use of recycled water and imported water in the region. Overall, the three appropriators in the Yucaipa Valley are progressing towards a balanced safe yield of groundwater extractions at about 3,000 million gallons per year.

Provide a description of any groundwater basin or basins from which the urban water supplier pumps groundwater. (California Water Code Section 10631(b)(2))

As discussed above, the overall water demand in the region has increased, but the amount of groundwater used to meet the demands has decreased. Technically, most of the groundwater basins in the Yucaipa Valley area considered in an overdraft situation, but significant efforts have been made by the Yucaipa Valley Water District to increase the amount of water in storage in the central part of the Yucaipa Valley.

Groundwater projection in the Yucaipa Valley generally is associated with three primary groundwater basins, the Yucaipa, San Timoteo and Beaumont Basins. The Yucaipa Basin is divided into a series of eight subbasins separated by faults and other physical barriers:

- Calimesa Basin
- Chicken Hill Basin
- Gateway Basin
- Oak Glen Basin
- Triple Falls Basin
- Western Heights Basin
- Wilson Basin
- Wildwood Basin

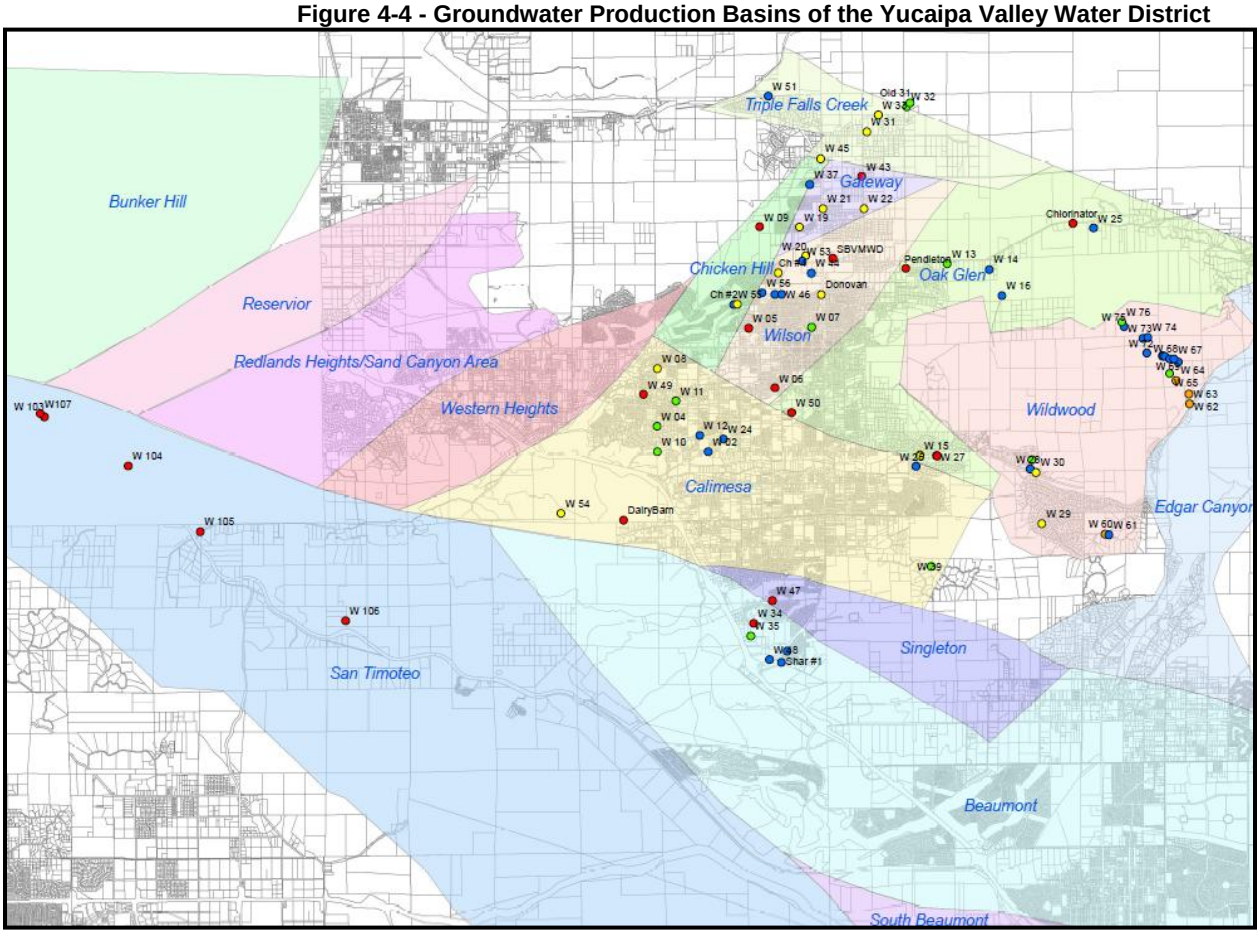
Other local groundwater basins operated and managed by the Yucaipa Valley Water District include: the San Timoteo Groundwater Basin; the Beaumont Groundwater Basin and the Singleton Groundwater Basin. The Department of Water Resources recognizes the Beaumont and San Timoteo Basin as one basin, the San Timoteo Subbasin.

Table 4-3 - Groundwater Basins in the YVWD Service Area

Groundwater Basin	Acres	Square Miles
Beaumont	17,035.48	26.62
Calimesa	6,627.40	10.36
Chicken Hill	1,043.65	1.63
Edgar Canyon	5,187.77	8.11
Gateway	570.05	0.89
Oak Glen	5,193.71	8.12
Sand Canyon	3,849.26	6.01
San Timoteo	31,131.42	48.64
Singleton	2,033.47	3.18
Triple Falls	1,632.30	2.55
Western Heights	2,601.53	4.06
Wildwood	4,980.71	7.78
Wilson	1,846.08	2.88

The following figure illustrates the complexity of the Yucaipa groundwater subbasins and their proximity to the Beaumont Basin and the San Timoteo Basin.

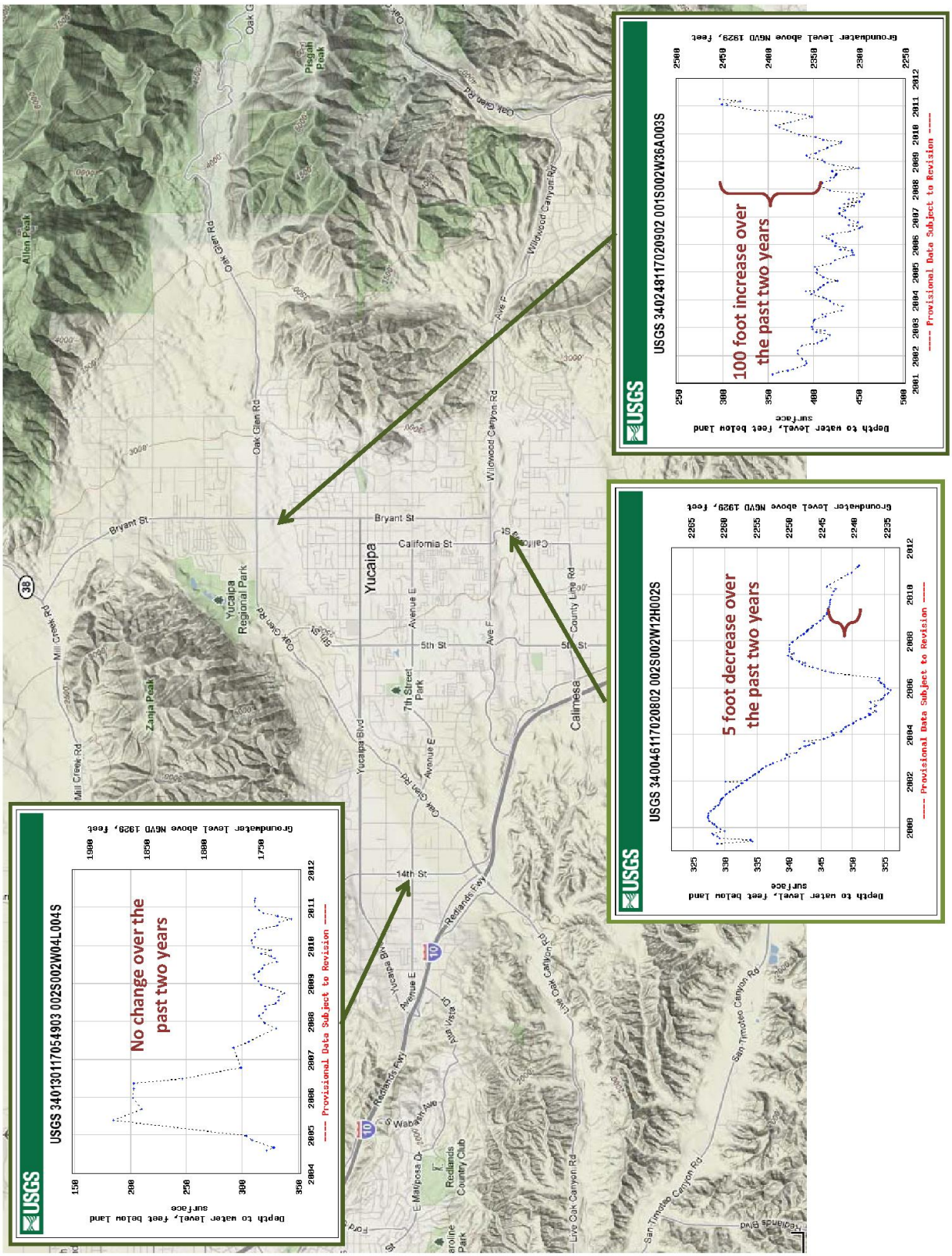
Figure 4-4 - Groundwater Production Basins of the Yucaipa Valley Water District



The Yucaipa Valley Water District relies on each of the underlying groundwater basins for groundwater management and resource protection under the maximum benefit objectives established by the Regional Water Quality Control Board.

As part of the management planning, the Yucaipa Valley Water District monitors the groundwater levels within each basin to protect the long-term quality and quantity of water available for our customers.

Figure 4-5 - Groundwater Level Change in the Yucaipa Valley



The following charts illustrate the variations of groundwater production by each subbasin within the Yucaipa Valley Water District Sphere of Influence.

Figure 4-6 - 2005 Groundwater Production by Subbasin

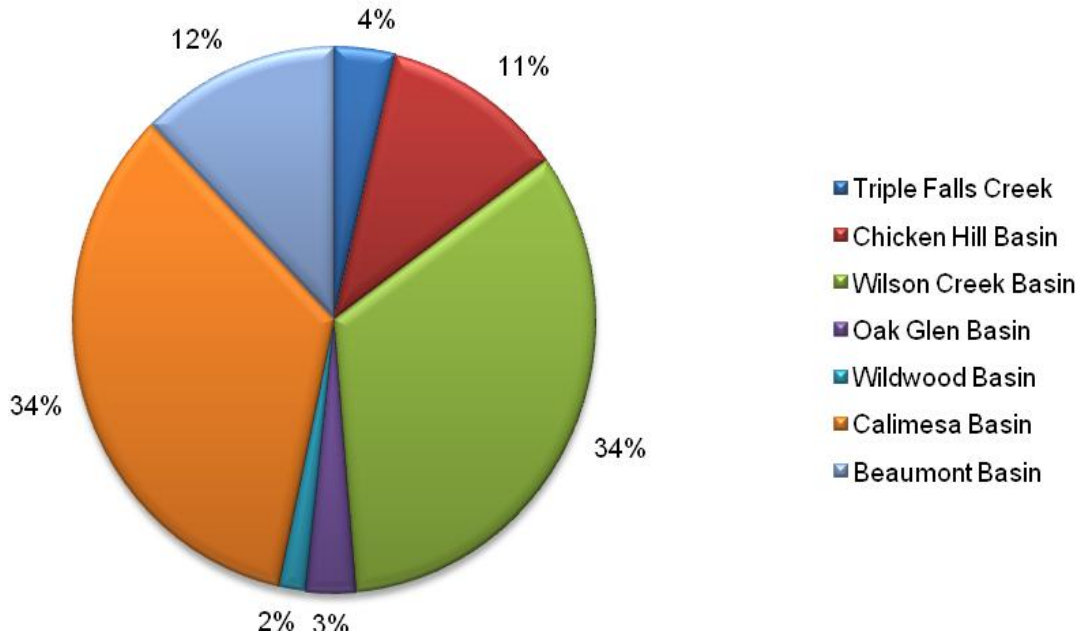
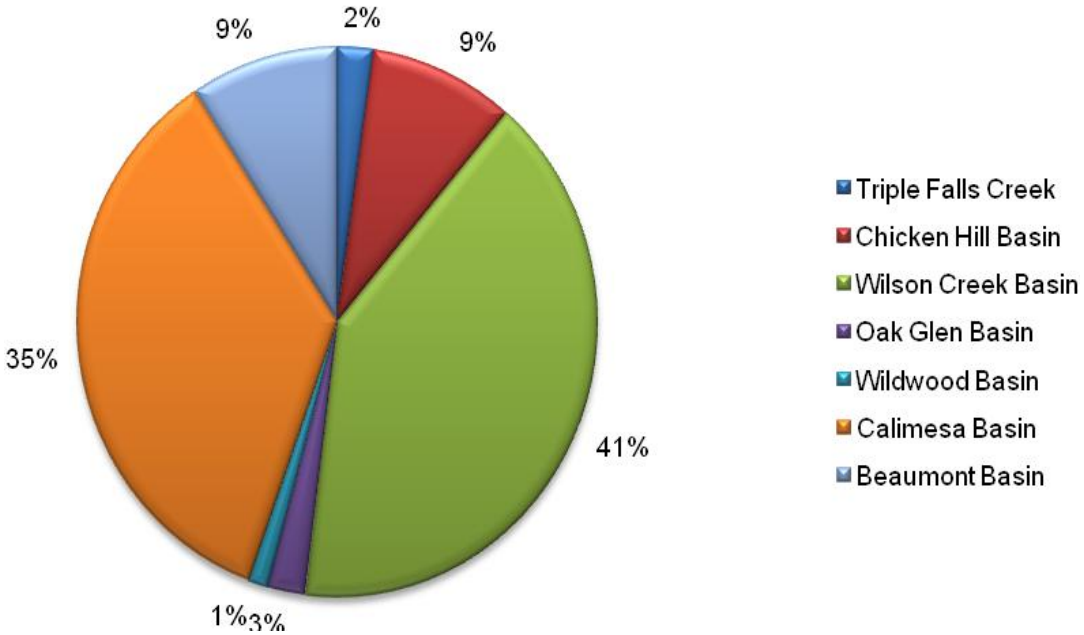
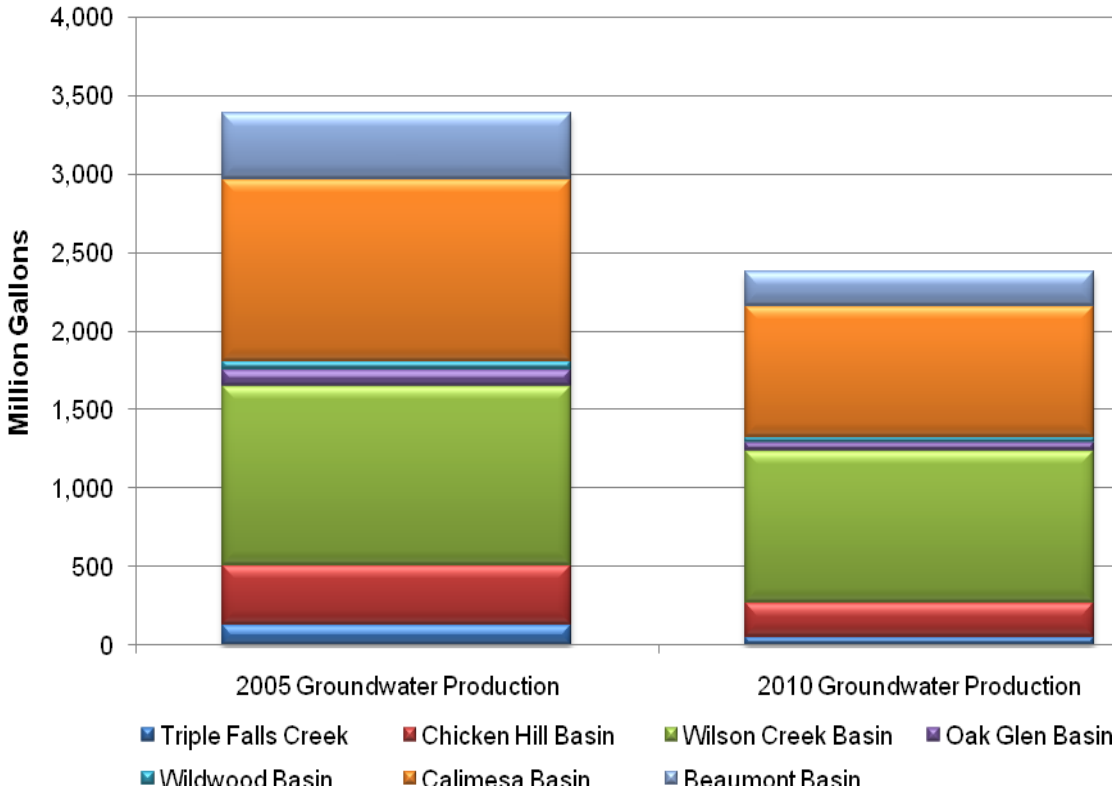


Figure 4-7 - 2010 Groundwater Production by Subbasin



The following charge illustrates the difference in total groundwater production from 2005 to 2010 as well as the location of groundwater production within the District's service area.

Figure 4-8 - Groundwater Production Comparison 2005 to 2010



The following table provides a detailed description of the three major groundwater basins within the service area of the Yucaipa Valley Water District.

Table 4-4 - Summary of Groundwater Basin Hydrogeologic Characteristics

Parameter	Yucaipa Basin	Beaumont Basin	San Timoteo Basin
Basin Area	41 square miles[2]	26 square miles[1,3]	49 square miles
Groundwater formations	Alluvium[1,4]	Alluvium[1,4]	Alluvium[1,4]
Depth of water bearing sediments	700 - 1000 feet[1,5]	700 - 1,000 feet[1,5]	700 - 1,000 feet[1,5]
Typical Specific Yields	4 - 22 percent[1,6] (10 percent average)	3 - 35 percent[1] (11 percent average)	3 - 35 percent[1] (11 percent average)
Groundwater Storage Capacity	800,000 acre-feet[1,7]	1,000,000 acre-feet[1,8]	1,000,000 acre-feet[1,8]
Estimated Long-term Natural Recharge	8,000 AFY[1,9]	8,560 AFY[1,10]	> 20,000 AFY[1,11]
Current Approximate Extractions	14,000 AFY[1]	16,000 AFY[1,12]	Not Available[13]
Dominant Recharge Source	Stream flow infiltration[1,14]	Stream flow infiltration and artificial Recharge[1]	Stream flow infiltration, subsurface inflow, and deep percolation[1]
Artificial Recharge Potential	7000-14,000 AF[1]	200,000 AF[1,15]	Not Available[13]
Typical Well Yields	200 gpm (average) [1]	200 gpm (average) [1]	Not Available[13]
Maximum Well Yields	2,800 gpm[1]	2,000 gpm[1,16]	Not Available[13]
Typical Municipal Well Depths	500 feet[1]	500 feet[1]	500 feet[1]
Typical Range of TDS concentration	200 - 630 mg/l[1]	170 - 340 mg/l[1]	Not Available[13]
Average Groundwater TDS	320 mg/l[1]	250 mg/l[1]	Not Available[13]

1 From DWR Bulletin No. 118 (*California's Groundwater*, 2004).
2 Water bearing sediments cover approximately 29 square miles (19,000 acres) within the Yucaipa Basin. The total watershed area of the basin is approximately 39 square miles (25,000 acres).
3 Water bearing sediments cover approximately 26 square miles (16,000 acres) within the Beaumont Basin. The total combined watershed area of the Beaumont and San Timoteo Basins is approximately 114 square miles (73,000 acres).
4 Includes recent alluvium from Holocene age, older Pleistocene age alluvium, and alluvial deposits within the eroded and folded Pliocene-Pleistocene age sediments of the San Timoteo Formation.
5 San Timoteo Formation depths extend to 1500 to 2000 feet, but water-bearing sediments appear limited to depths of 700 to 1000 feet.
6 Lowest specific yields are reported northeast of Yucaipa. In the southern part of the basin, specific yields are estimated to range from 6 to 22 percent, with an average of 10 percent.
7 Storage capacity estimates reported by DWR Bulletin No. 118 range from approximately 800,000 AF to 1.2 million AF.
8 Total combined storage capacity of the Beaumont and San Timoteo Basins is estimated at 2,000,000 by DWR. Approximately one-half of this capacity is in the Beaumont Basin and one half is in the San Timoteo Basin.
9 Approximate long-term yield presented in DWR Bulletin No. 118 on the basis of studies performed in 1980. A 1988 study performed for YVWD entitled *Perennial Yield of the Yucaipa Groundwater Basin* (David Keith Todd Consulting Engineers, 1988) estimated a long-term yield of approximately 7,900 AFY.
10 Long-term yield estimated at 8,650 AFY, as reported in the FY2005-2006 annual Beaumont Basin Watermaster Report.
11 Estimate not available. Recharge estimates for the combined San Timoteo/Beaumont Basins provided within DWR Bulletin No. 118 suggest that the total long-term recharge to the San Timoteo Basin is in excess of 20,000 AFY.
12 Annual production has ranged from 14,100 AFY to 19,300 AFY during the period FY2003-04 and FY2006-07, as reported in the FY 2006-07 Beaumont Basin Watermaster report.
13 Estimated value not available for the San Timoteo Basin.
14 Infiltration from Yucaipa, Wilson, and Oak Glen Creeks, predominantly in the north and eastern portions of the basin.
15 Estimated by Beaumont Basin Watermaster in annual report for FY2006-07.
16 Based on pumping data presented in the Beaumont Basin Watermaster FY 2006-2007 Annual Report, adjusted by an assumed 70 percent operational factor.

4.3.1 Yucaipa Groundwater Basin

The Yucaipa Groundwater Basin is located in the Santa Ana Subregion of the South Coast Hydrologic Region within the County of San Bernardino. The Yucaipa Basin has a surface area of 25,300 acres (DWR Bulletin 118) and a capacity of 800,000 AF (Groundwater Water Recharge/Recovery Project, 2009). The Basin is bounded on the north by the San Andreas fault, on the west by the Redlands fault and the Crafton Hills, on the south by the Banning fault, and on the east by the Yucaipa Hills.

Alluvial deposits in the subbasin are divided into older and younger units. The Holocene age younger alluvium consists of unconsolidated boulders, gravel, sand, silt, and clay (Moreland 1970). This unit forms a thin veneer and is mostly above the water table (Moreland 1970). The middle to late Pleistocene age older alluvium consists of boulders, gravel, sand, silt, and clay (Moreland 1970), and holds the primary source of groundwater in the subbasin. Clays present in this section are due to weathering and soil formation during accumulation of the deposits (DPW 1934).

The 2003 California Department of Water Resources Bulletin 118-2003 identifies the Basin in overdraft. Although the basin is defined in an overdraft state; water levels are at or near historic highs (California's Groundwater Bulletin 118, 2004). Moreover, the Yucaipa Valley Water District has decreased groundwater pumping dramatically since 2007 attributable to the supplemental supply of State Water Project Water and the use of recycled water. Prior to importing State Water Project water, Yucaipa Valley Water District pumped 3,585 million gallons per year (YVWD 2005 Production Report). Incorporating supplemental water has reduced pumping by 50% (YVWD 2010 Production Report).

The Yucaipa Groundwater Basin is subdivided into several subbasins including the: Calimesa, Chicken Hill, Gateway, Oak Glen, Singleton, Triple Falls Creek, Western Heights, Wildwood and Wilson Subbasin.

Calimesa Subbasin - The Calimesa subbasin along with the Wilson Creek subbasin are the two largest subbasins within the Yucaipa Groundwater Basin. Total capacity of the Calimesa subbasin is estimated at 175,000 acre-feet (Groundwater Water Recharge/Recovery Project, 2009). The safe yield of the basin is small compared to this storage capacity, and is estimated at 1,500 million gallons per year, or 4,600 acre feet per year (Wildermuth, 2005). Groundwater is typically reached within 225-350 feet below the land surface (Wildermuth, 2005).

Chicken Hill Subbasin - The Chicken Hill subbasin is located in the northwest portion of the Yucaipa Basin. The subbasin has a total of five wells with two of those wells being active as of December 2010.

Gateway Subbasin - The Gateway subbasin is located in the northern portion of the Yucaipa Basin. Currently there are no active wells in use as of December 2010. The Gateway subbasin contains three abandoned wells and one monitoring well.

Oak Glen Subbasin - The Oak Glen Subbasin is located in the Northeastern portion of the Yucaipa Basin while extending south between the Wilson and Wildwood Subbasins as it straddles the mountain range to the east. The subbasin represents one of the

largest subbasins within the Yucaipa Basin. Five active wells, four monitoring wells and one inactive well are located within this subbasin.

Singleton Subbasin - The Singleton Subbasin is located in the southern most portion of the Yucaipa Valley Water District's service area within the City of Calimesa in Riverside County. The subbasin contains one monitoring well

Triple Falls Creek Subbasin - The Triple Falls Creek subbasin is the northernmost subbasin within Yucaipa Valley Water District's service area. This subbasin contains one active well, two abandoned wells and two inactive wells just outside of the subbasin boundary.

Western Heights Subbasin - The Western Heights Subbasin is located in the western portion of the Yucaipa Basin and extends into the City of Redlands. The basin contains no wells utilized by the Yucaipa Valley Water District. Groundwater extraction from this basin is generally from the Western Heights Mutual Water Company.

Wildwood Subbasin - The Wildwood Subbasin is located in the eastern portion of the Yucaipa Basin and possesses the largest amount of active wells utilized by YVWD totaling 11 active wells. Additional well status results in three inactive wells, four standby and two abandoned wells.

Wilson Subbasin - The Wilson subbasin is one of the largest subbasins within the Yucaipa Basin. The Wilson Subbasin has a large storage capacity (estimated at 125,000 acre-feet by Carollo, 1985). The safe yield of the subbasin is small (estimated at 1,500 AFY (Wildermuth, 2005) compared to the large storage capacity. Existing depth to groundwater in the Wilson basin average roughly 175 to 425 feet below ground surface (Wildermuth, 2005).

The additional spreading of water in the Wilson Creek spreading grounds and utilization of the Oak Glen Creek stream channel for recharge has contributed to increased groundwater levels. By maximizing the existing spreading grounds the capability exists to spread from 7,000 to 14,000 acre-feet of surface water annually into the Yucaipa Basin.

With ample storage, ability to recharge the basin through in-lieu use of surface water and by direct spreading surface waters and apparent flexibility in managing groundwater levels without subsidence problems, the Yucaipa Basin could be conjunctively managed both to meet normal annual demands and to meet water resource needs in the event of a drought and curtailment or loss of inconsistent surface water supplies, resulting in a highly reliable water supply. Current goals are to secure agreements to not pump beyond the long-term safe yield of the basin by utilizing the imported surface water supplemental supply.

The Yucaipa Valley Water District has cooperated with the U.S. Geological Survey and the San Bernardino Valley Municipal Water District to construct real-time groundwater monitoring wells in the area. Groundwater level data indicates that the groundwater levels in the Wilson subbasin have increased in 2009 and 2010. This is attributed to the additional supplemental supply of State Water Project water (Groundwater Water Recharge/Recovery Project, 2009).

Provide a copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management (California Water Code Section 10631(b)(1))

The Yucaipa Valley Water District is currently involved with development of a groundwater management plan (AB 3030 Plan) to proscribe collective management of the Yucaipa Groundwater Basin. With ample storage, ability to recharge the basin by spreading surface waters and apparent flexibility in managing groundwater levels without subsidence problems, the Yucaipa Basin could be conjunctively managed both to meet normal annual demands and to meet water resource needs in the event of a drought and curtailment or loss of inconsistent surface water supplies, resulting in a highly reliable water supply. Current goals are to secure agreements to not pump beyond the safe yield of the basin, supplementing supplies with imported surface.

4.3.2 San Timoteo Groundwater Basin

The San Timoteo Groundwater Basin is located downstream from the Yucaipa and Beaumont groundwater basins in northeastern Riverside County and Southeastern San Bernardino County. The characteristics of this groundwater basin differ between the Department of Water Resources and the State Water Resources Control Board. This groundwater basin covers approximately 29 square miles. Groundwater movement in the San Timoteo Groundwater Basin trends from the east to the west. Surface water in the area is drained by San Timoteo Creek.

As with the Yucaipa and Beaumont Basins, groundwater is found in alluvium and in the San Timoteo Formation to depths of 700 to 1000 feet. Estimates for total groundwater storage capacity within the basin vary. On the basis of information presented by DWR (2004), the total groundwater capacity in the basin appears to be approximately 1,000,000 AF.

On the basis of information presented in DWR Bulletin No. 118, it appears that long-term recharge to the San Timoteo Basin is significantly higher than recharge within either the Yucaipa or Beaumont Basins (estimated to be on the order of 20,000 AFY). No significant long-term decline in depths to groundwater is reported in the San Timoteo Basin.

The San Timoteo Basin is not adjudicated, and reliable estimates of total groundwater pumping within the San Timoteo basin are not available. Because water table elevations within the basin have not declined (and remain near the surface in some areas along San Timoteo Creek), it may be concluded that long-term pumping within the basin is less than the long-term average recharge.

4.3.3 Beaumont Groundwater Basin

The Beaumont Basin is located in northwestern Riverside County, south of the Yucaipa Basin. The basin is drained by San Timoteo Creek, a tributary of the Santa Ana River and covers approximately 26 square miles. Groundwater elevations generally slope from the northeast to southwest in the basin.

Groundwater within the basin is predominantly found in Holocene age alluvium and in the San Timoteo Formation. While the San Timoteo Formation extends to depths in excess of 1500 feet, water bearing sediments within the Beaumont Basin exist to depths of 700 to 1000 feet.

Estimates for total groundwater storage capacity within the basin vary. The Beaumont Basin storage capacity is estimated at approximately 1,000,000 AF. (Beaumont Basin Watermaster, 2007)

In February 2004 the San Timoteo Watershed Management Authority filed a judgment adjudicating the groundwater rights in the Beaumont Basin and assigned the Beaumont Basin Watermaster with the authority to manage the groundwater basin. The Beaumont Basin Watermaster is comprised of managers from the Beaumont Cherry Valley Water District, City of Banning, City of Beaumont, South Mesa Mutual Water Company and Yucaipa Valley Water District. The Beaumont Basin Watermaster reports a long-term yield for the Beaumont Basin of 8,560 AFY. Extraction within the basin is limited to a long-term average of 16,000 AFY (160,000 AF over 10 years). During the past four years, the Watermaster reports annual groundwater extractions in the basin that range from 14,100 AFY to 19,300 AFY. Yucaipa Valley Water District pumping from the Beaumont basin was approximately 527 AFY during FY 2008/2009

For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board (California Water Code Section 10631(b)(2)).

Provide a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree (California Water Code Section 10631(b)(2)).

The adjudication of the Beaumont Basin has defined overlying and appropriator pumping rights and also allows for supplemental water to be stored and recovered from the basin.

Table 4-5 Appropriators of the Beaumont Basin

Producer	Average Production During 1997-2001 (acre-ft/yr)	Share of Safe Yield Allocated to Appropriators	Initial Estimate of Appropriate Rights[1] (acre-ft/yr)	Controlled Overdraft and Supplemental Water Recharge Allocation[2] (acre-ft/yr)	Operating Yield (acre-ft/yr)
City of Banning	2,170	31.43%	882	5,029	5,910
City of Beaumont	0	0.00%	0	0	0
Beaumont Cherry Valley Water District	2,936	42.51%	1,193	6,802	7,995
South Mesa Water Company	862	12.48%	350	1,996	2,346
Yucaipa Valley Water District	938	13.58%	381	2,173	2,554
Total	6,906	100.00%	2,805	16,000	18,805

[1] *Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.*
[2] *Volumes shown here should be consistent with Tables 17 and 18.*

The Beaumont Basin, under this adjudication, is considered to be in a condition of overdraft with assigned maximum annual overlying production rights of 8,650 acre-feet. The Yucaipa Valley Water District has a right to an operating yield of 2,552 acre-feet annually from the Beaumont

Basin, which consists of 381 acre-feet of appropriative right and 2,173 acre-feet of Controlled Overdraft and Supplemental Water Recharge Allocation. The District can deliver amounts in addition to the 2,552 acre-feet as supported from overlying water right holders.

4.4 Groundwater Basin Management

For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition (California Water Code Section 10631(b)(2)).

The two basins that have not been adjudicated within the Yucaipa Valley Water District's service area are the Yucaipa Basin and San Timoteo Basin. Under present management conditions the basins are expected to have controlled overdraft conditions. Prior to 2007, the Yucaipa Basin was considered in overdraft due to over extractions by the Yucaipa Valley Water District, South Mesa Water Company and Western Heights Mutual Water Company. In 2005, the Yucaipa Valley Water District began treating State Water Project water through a newly constructed Yucaipa Valley Regional Filtration Facility. This has provided an opportunity to alleviate pumping from local supplies increasing groundwater levels to 70 feet in one well location in the Wilson subbasin (USGS Groundwater Monitoring Levels).

Table 4-6 - Basin Plan Groundwater Quality Objectives (RWQCB)

Parameter	Type of Objective	Basin Plan Water Quality Objective (mg/l)		
		Yucaipa Basin	Beaumont Basin	San Timoteo Basin
Total Dissolved Solids (TDS)	Maximum Benefit	370	330	400
	Antidegradation	320	230	300
Nitrate-nitrogen	Maximum Benefit	5.0	5.0	5.0
	Antidegradation	4.2	1.5	2.5

- Basin Plan objectives established by Regional Board Resolution R8-2004-001.
- Maximum Benefit objectives apply unless the Regional Board determines that lowering of water quality is not to the maximum benefit of the people of the State of California. Otherwise, the antidegradation objectives apply.

Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (California Water Code Section 10631(b)(3)).

Table 4-7 – Amount of Groundwater Extracted

Basin name(s)	2006	2007	2008	2009	2010
Yucaipa Groundwater Basin	2,881.0	2,632.3	2,047.2	1,903.5	2,159.4
Beaumont Groundwater Basin	660.6	548.4	186.3	164.4	219.1
San Timoteo Groundwater Basin	0.0	0.0	0.0	0.0	0.0
Total Groundwater Pumped	**3,541.6**	**3,180.7**	**2,233.5**	**2,067.9**	**2,378.5**
Percentage of Total Water Supply	79.5%	65.4%	48.1%	45.1%	60.1%
Percentage of Potable Water Supply	87.5%	74.5%	53.0%	49.3%	65.8%

Units are in million gallons.

Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records (California Water Code Section 10631(b)(4)).

Table 4-8 - Projected Amount of Groundwater to be Extracted

Basin name(s)	2015	2020	2025	2030	2035
Yucaipa Groundwater Basin	1,900	1,900	1,900	1,900	1,900
Beaumont Groundwater Basin	125	125	125	125	125
San Timoteo Groundwater Basin	75	75	75	75	75
Total Groundwater Pumped	**2,100**	**2,100**	**2,100**	**2,100**	**2,100**
Percentage of Total Water Supply	42.5%	39.4%	36.5%	33.8%	31.2%
Percentage of Potable Water Supply	47.5%	45.5%	43.5%	41.5%	39.5%

Units are in million gallons.

4.5 Imported Water Sources - State Water Project

The Yucaipa Valley Water District purchases imported water from two State Water Project contractors, the San Bernardino Valley Municipal Water District (SBVMWD) for the San Bernardino County portion of the service area, and the San Gorgonio Pass Water Agency (SGPWA), for the Riverside County portion of the service area.

The two State Water Contractors convey imported water from the Sacramento San Joaquin Delta, which is utilized as a supplemental potable water source to the local supply and is treated at the Yucaipa Valley Regional Filtration Facility. The imported water is also used for groundwater recharge and recycled water irrigation of landscaping at numerous sites throughout the community.

4.5.1 San Bernardino Valley Municipal Water District (SBVMWD)

The San Bernardino Valley Municipal Water District has an entitlement to 102,600 acre-feet of State Water Project water that is used for both direct deliveries to treatment plants and artificial recharge of the groundwater basins (Regional Water Management Plan, 2010). Yucaipa Valley

Water District received a total of 9,086 acre feet from SBVMWD for direct deliveries, groundwater recharge in the Wilson Basin and non-potable water for landscape use in 2010.

Table 4-9 - 2010 SBVMWD Water Supply Uses

Use	Million Gallons (Acre Feet)
Direct Deliveries	1,078.082 (3,317)
Groundwater Recharge	1,500.578 (4,603)
Recycled Water	383.376 (1,176)
Total	2,962.036 (9,086)

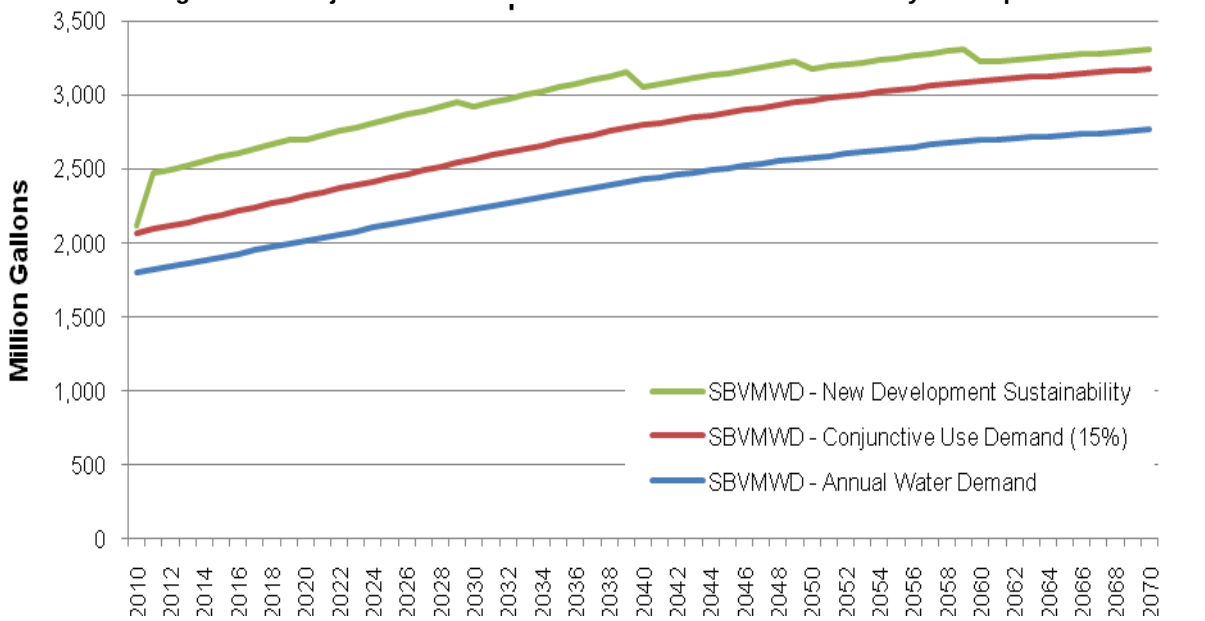
The following table and chart reflects the anticipated imported water demands from the San Bernardino Valley Municipal Water District.

Table 4-10 – Yucaipa Valley Water District Demand Projections Provided to Wholesale Supplier San Bernardino Valley Municipal Water District

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	1,800.0	1,906.9	2,016.7	2,125.0	2,234.5	2,335.3
Conjunctive Use Demands: Local Water Banking	270.0	286.0	302.5	318.8	335.2	350.3
New Development Long-Term Supply Sustainability Program	43.3	391.0	381.0	396.0	356.0	368.0
Total	2,113.3	2,583.9	2,700.2	2,839.8	2,925.7	3,053.6

Units in million gallons per year.

Figure 4-9 - Projected Water Demands of the San Bernardino Valley Municipal Water District



4.5.2 San Gorgonio Pass Water Agency (SGPWA)

The San Gorgonio Pass Water Agency has an entitlement to 17,300 acre-feet of State Water Project water that is used for both direct deliveries to treatment plants and artificial recharge of the groundwater basins. The San Gorgonio Pass Water Agency needs to secure an additional 22,000 acre-feet per year of supplemental water to meet the ultimate demand of 94,000 acre-feet per year by year 2045 (SGPWA Supplemental Water Supply Planning Study, October 2009).

Yucaipa Valley Water District received a total of 123.08 acre feet from the San Gorgonio Pass Water Agency for direct deliveries in 2010.

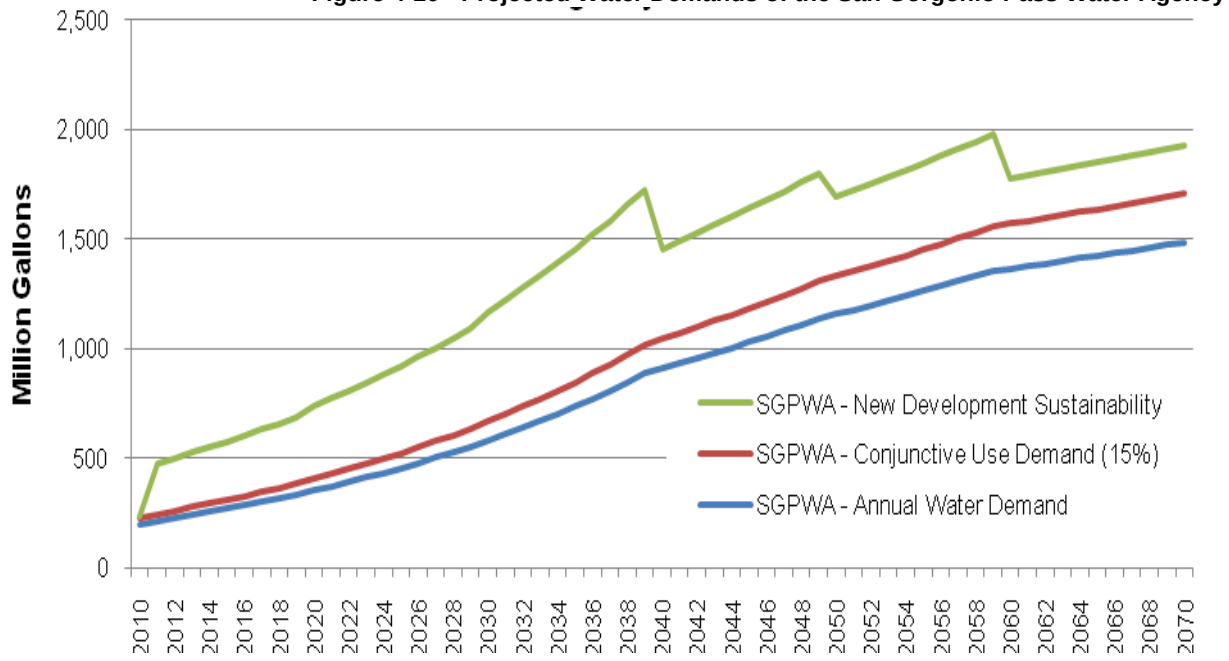
The following table and chart reflects the anticipated imported water demands from the San Gorgonio Pass Water Agency.

Table 4.11 – Yucaipa Valley Water District Demand Projections Provided to Wholesale Supplier San Gorgonio Pass Water Agency

Imported Water Demands	2010	2015	2020	2025	2030	2035
Drinking Water Demands: Yucaipa Valley Water Filtration Facility	200.0	269.0	351.8	454.9	579.7	736.3
Conjunctive Use Demands: Local Water Banking	30.0	40.4	52.8	68.2	87.0	110.4
New Development Long-Term Supply Sustainability Program	2.3	266.0	333.0	398.0	503.0	607.0
Total	232.3	575.4	737.6	921.1	1,169.7	1,453.7

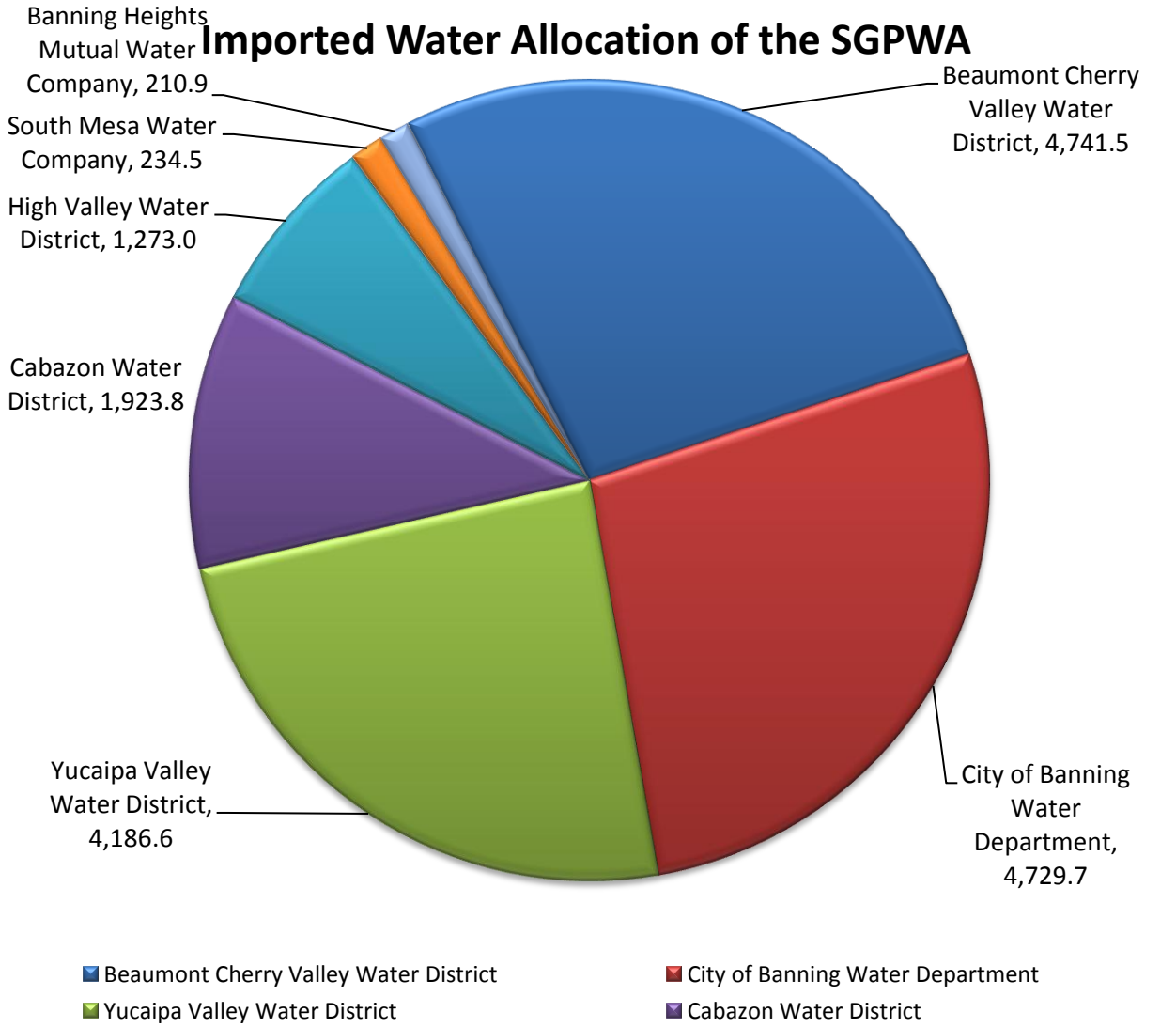
Units in million gallons per year.

Figure 4-10 - Projected Water Demands of the San Gorgonio Pass Water Agency



The water retailers of the San Gorgonio Pass Water Agency have focused on ensuring that the limited water resources of the wholesale agency are not over allocated by those water retailers preparing Urban Water Management Plans and other water retailers not required to prepare these planning documents. Based on our most recent discussions, the following allocation is being applied to the limited water resources of the San Gorgonio Pass Water Agency.

Figure 4-11 - Proposed Water Allocation for theSan Gorgonio Pass Water Agency (Units of measurement are shown in Acre Feet)



4.6 Transfer Opportunities

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis (California Water Code Section 10631(d)).

The Santa Ana-Mill Creek Cooperative Water Project Agreement permits the Yucaipa Valley Water District to exchange up to 32 cfs of water from the State Water Project for Mill Creek water when available. This source and exchange concept is highly variable, and largely depends on local hydrology and participation by other local water purveyors. Generally, the lack of storage limits the ability to use this water during dry years.

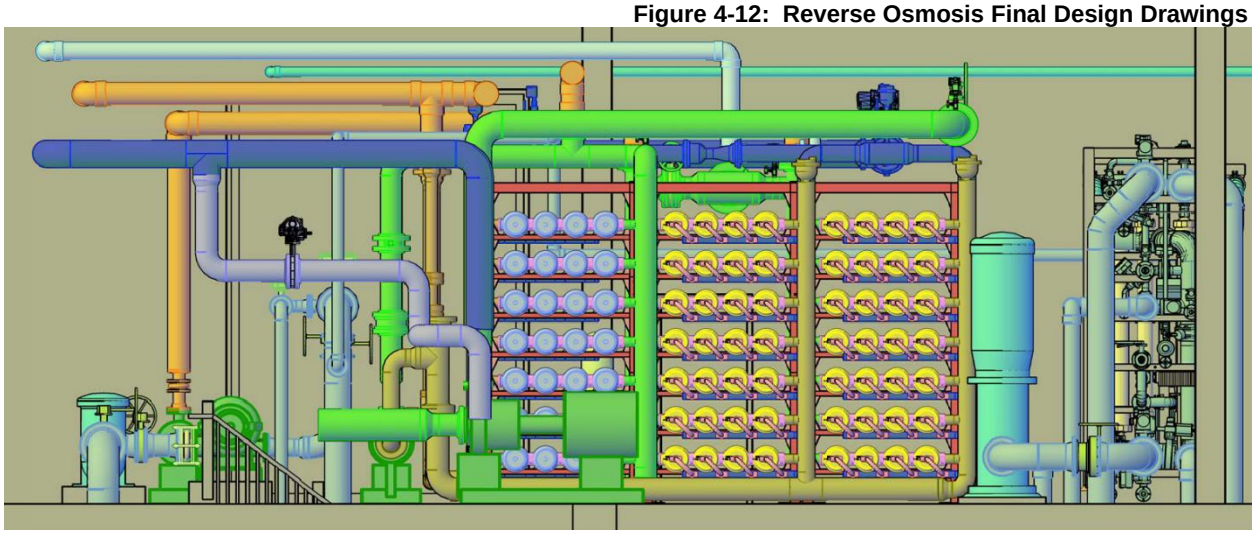
The Yucaipa Valley Water District is in the process of investigating the ability to participate in dry year purchase programs of water supply arranged by the Department of Water Resources, through the San Bernardino Valley Municipal Water District and the San Gorgonio Pass Water Agency, or pursue individual District initiated transfers as may be necessary and as supplies may be available. The District has not initiated nor does it have plans to initiate any short or long-term transfers for water at this time.

4.7 Desalinated Water Opportunities

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply (California Water Code Section 10631(i)).

The Yucaipa Valley Water District's Water Supply Renewal Project includes the construction of reverse osmosis membrane treatment at the Yucaipa Valley Regional Water Filtration Facility (YVRWFF) for the treatment of imported water supplies in compliance with the basin plan objectives set by the Regional Water Quality Control Board. Additionally, the Yucaipa Valley Water District will be adding reverse osmosis membrane treatment equipment at the Wochholz Regional Water Recycling Facility (WRWRF) to produce high quality recycled water in compliance with the basin plan objectives.

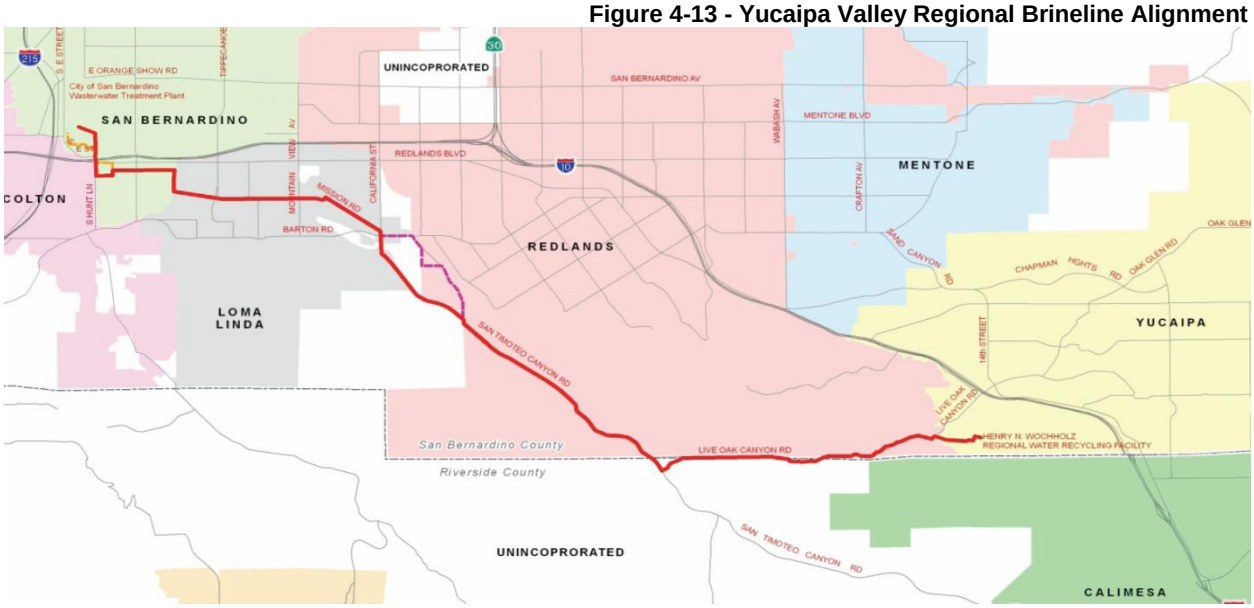
Figure 4-12: Reverse Osmosis Final Design Drawings



Both of these advanced treatment systems are dependent upon the completion of the Yucaipa

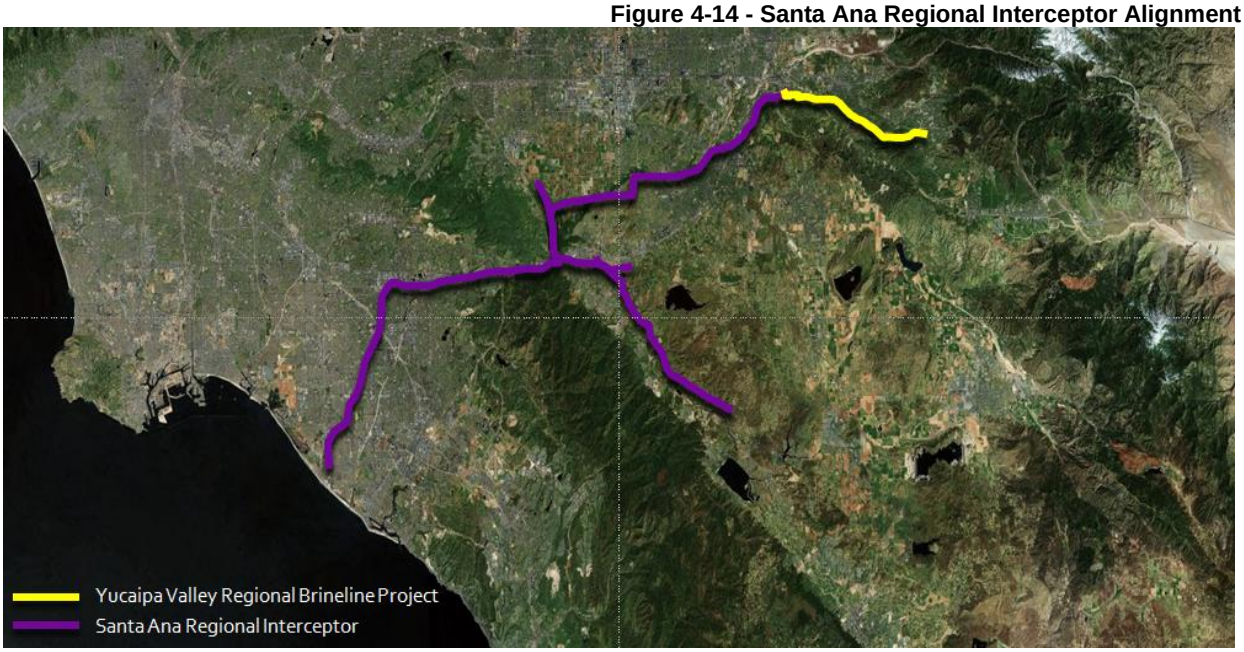
Valley Regional Brineline, a 15-mile extension of the Santa Ana Regional Interceptor to the Wochholz Regional Water Recycling Facility.

Figure 4-13 - Yucaipa Valley Regional Brineline Alignment



The Yucaipa Valley Regional Brineline began construction in September 2010. The 15-mile pipeline will connect the Wochholz Regional Water Recycling Facility with the eastern termination point of the Santa Ana Regional Interceptor owned and operated by the Santa Ana Watershed Project Authority. From the termination point, the At this point the brineline extends another 73 miles traversing San Bernardino, Riverside and Orange counties to Orange County Sanitation District Wastewater Treatment Plant No. 2 in Huntington Beach, where the salt water is treated and discharged to the Pacific Ocean.

Figure 4-14 - Santa Ana Regional Interceptor Alignment

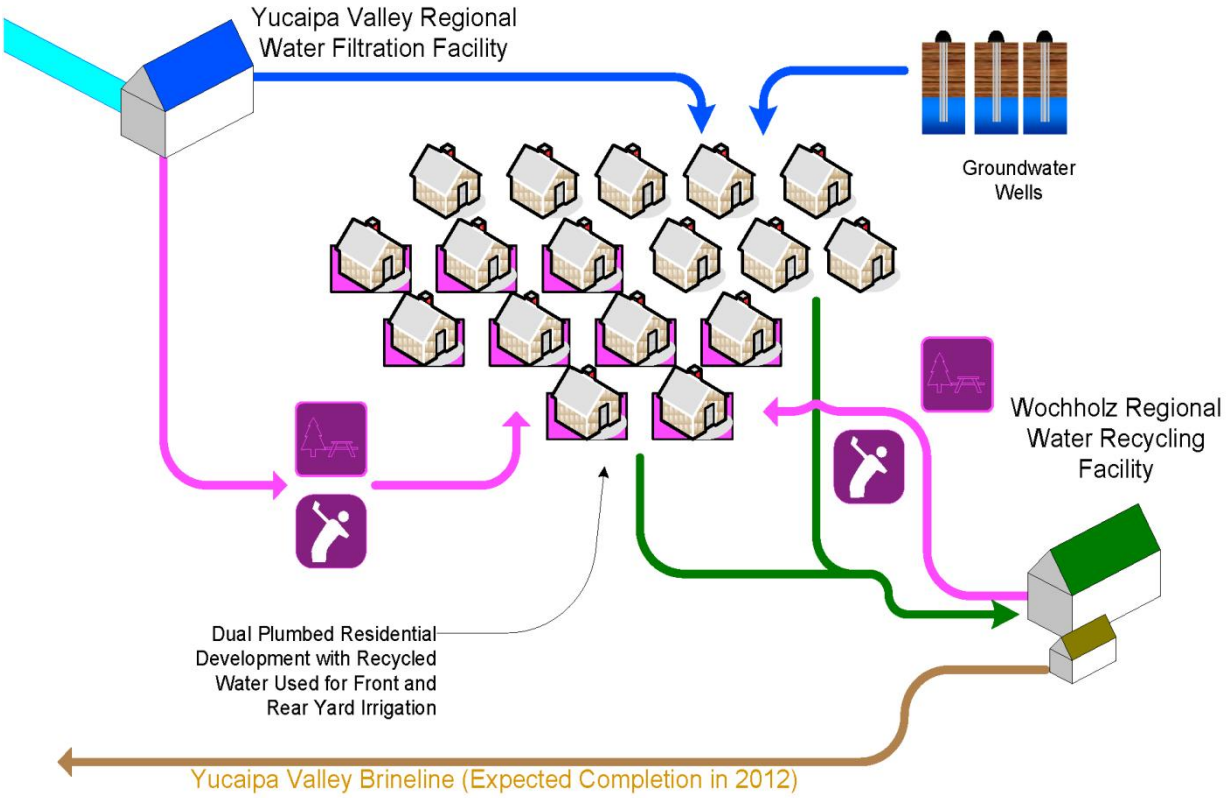


4.8 Recycled Water Opportunities

Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area (California Water Code Section 10633).

The Yucaipa Valley Water District is one of the most proactive advocates of recycled water use and implementation in the Inland Empire. The Board of Directors has adopted planning guidelines that require the use of recycled water for front and rear yard irrigation of new development throughout the District's service area.

Figure 4-15 - Conceptual Schematic of Dual Plumbed Homes



Recycled water is currently used to provide up to 10 percent of Yucaipa Valley Water District's overall water demands. A significant portion of the Yucaipa Valley Water District's projected future water demands will be met with the use of recycled water for irrigation of golf courses, parks, landscape areas and front-/rear-yard irrigation of residential dwellings.

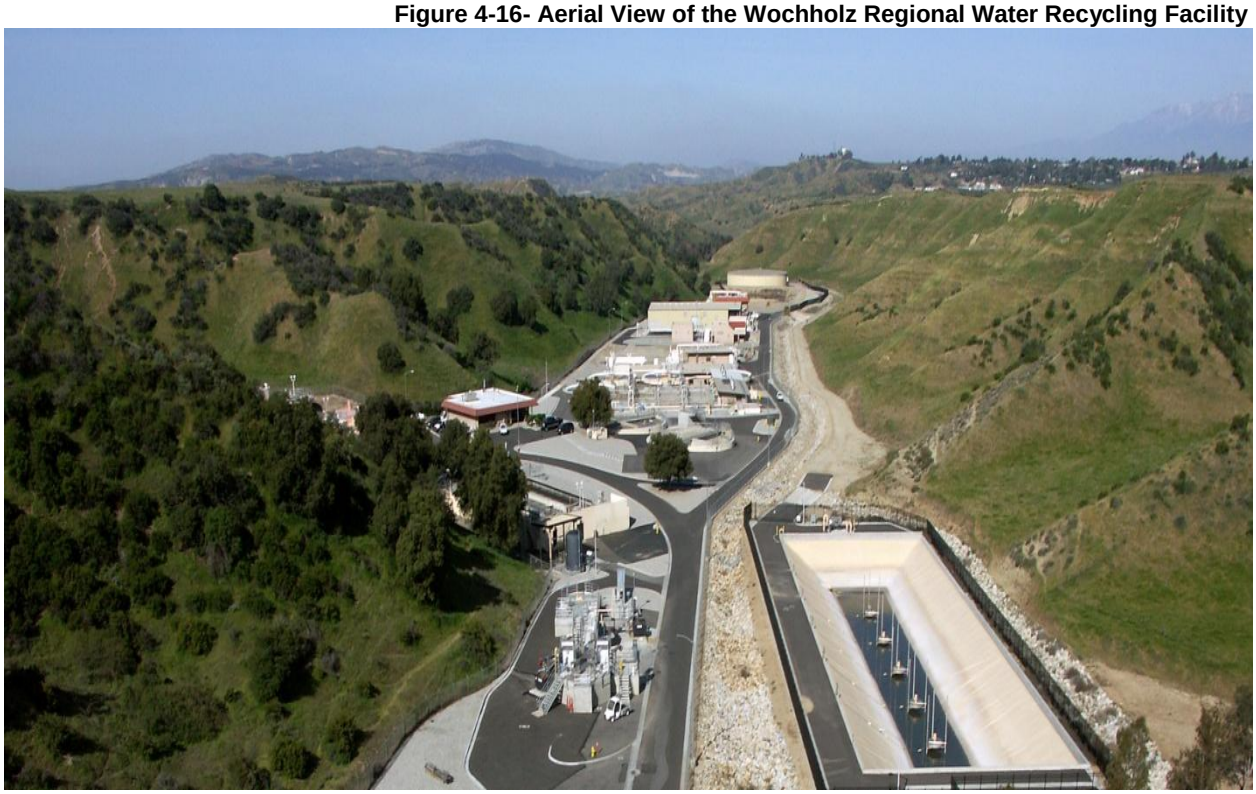
To serve the projected water demands, the Yucaipa Valley Water District has implemented an extensive dual water distribution system. The dual water system includes a drinking water conveyance system to convey potable water to customers and a separate recycled water distribution system to convey recycled water to customers

Describe the wastewater collection and treatment systems in the supplier's service area including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal (California Water Code Section 10633(a)).

As water becomes an increasingly precious commodity, Yucaipa Valley Water District is stepping up its recycling efforts so that more water can be reused on golf courses, school grounds, roadside medians and for other landscaping purposes -- even the front and rear yards of new homes.

To achieve this objective, the Yucaipa Valley Water District recently expanded and enhanced the sewer treatment plant, or water recycling facility, to a capacity of 8 million gallons per day. The District's water recycling facility is one of a relatively small number of sewer treatment facilities in the country to be equipped with microfiltration filters and ultraviolet light for disinfection. The treatment process used to transform our sewer water to recycled water is very similar to some drinking water treatment plants. This provides high quality recycled water that is also extremely safe.

Figure 4-16- Aerial View of the Wochholz Regional Water Recycling Facility



The new microfiltration technology is important because it sets the stage for the District to install a reverse osmosis system at the water recycling facility to further purify our recycled water. While the microfiltration system does not allow particles larger than 0.1 micrometer to pass through the filtration system and become part of the recycled water supply, a reverse osmosis system will create a physical barrier to stop salt molecules while allowing water molecules to pass through. The resulting water supply will be very similar to the purity of rainwater.

This state-of-the-art technology commonly used by desalinization plants to convert ocean water to drinking water will soon be used by the District to meet strict water quality objectives set by the Regional Water Quality Control Board. With the requirement to produce such exceptionally high quality recycled water, the District has developed plans to use the recycled water for the direct benefit of the community.

With the construction of the reverse osmosis facility, the District will be required to construct a new pipeline to dispose of the salts removed by the treatment system. The Yucaipa Valley Brineline will be a 15-mile pipeline that will connect to an existing brine disposal pipeline located in San Bernardino. Ultimately the brine solution created by the District, which is about 1/10th as salty as sea water, will be conveyed to the Orange County Sanitation District to be added to their ocean outfall.

Table 4-12: Recycled Water - Wastewater Collection and Treatment

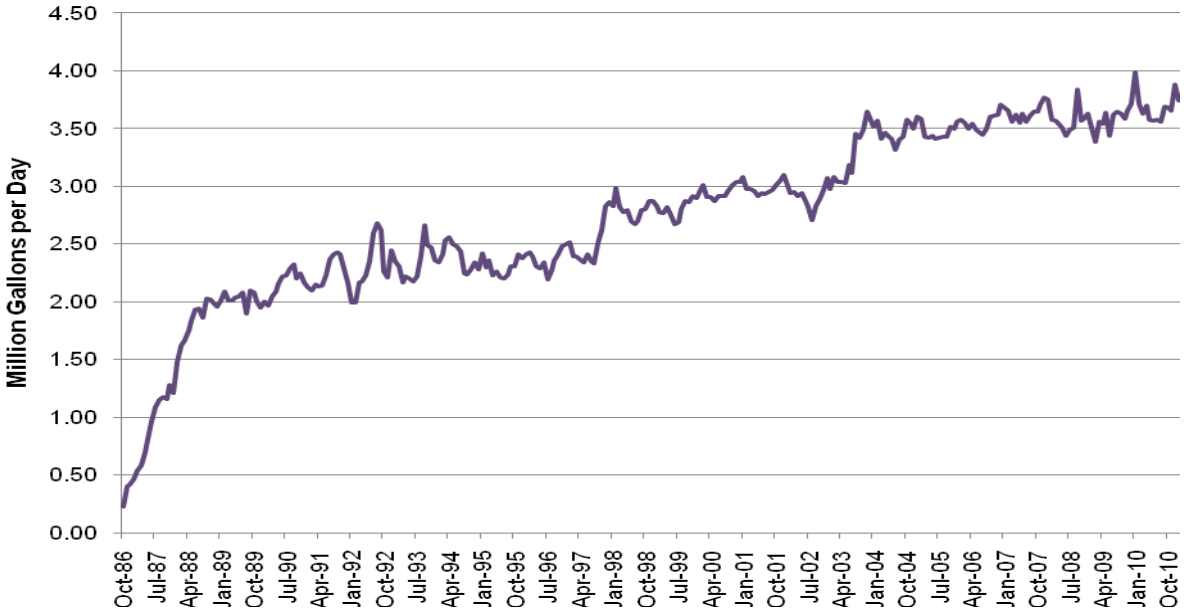
Type of Wastewater	2005	2010	2015	2020	2025	2030	2035
Wastewater Collected and Treated to Advanced Tertiary in the Yucaipa Valley Water District Service Area	1,270	1,346	1,483	1,612	1,787	1,964	2,087
Percentage of Wastewater Collected that Meets Recycled Water Standard	100%	100%	100%	100%	100%	100%	100%
Volume of Water Disposed by Land Outfalls	657	657	657	657	657	657	657

Units in million gallons per year.

Describe the quantity of treated wastewater that meets recycled water standards, is being discharged and is otherwise available for use in a recycled water project (California Water Code Section 10633(b)).

The Yucaipa Valley Water District started treating wastewater in 1986. The sewer collection system has been expanded steadily over the years to provide additional recycled water supplies to the community.

Figure 4-17: Recycled Water Production History



The Yucaipa Valley Water District recently expanded the Wochholz Regional Water Recycling Facility to a 6.7 MGD wastewater treatment facility. The ultimate facility is expected to be capable of treating up to 10 million gallons per day of wastewater.

The Wochholz Regional Water Recycling Facility includes the following major components:

- Septage Receiving Station - A septage receiving facility provides septage haulers an efficient location to discharge septage wastes for treatment at the plant.

- Headworks Grit Removal System - The grit removal system has been recently upgraded and enlarged to increase grit removal efficiency and reduce the impacts of grit on downstream treatment processes.

- Primary Equalization Tank - The primary equalization tank provides the District with the ability to stabilize daily flow variations and hold additional wastewater during peak periods for a steady-state treatment flow throughout the treatment facility.

- Secondary Treatment System - The secondary treatment system has been equipped with nitrogen removal technology that is used to provide compliance with the total inorganic nitrogen limits of 6 mg/l.

- Advanced Tertiary Treatment Facilities - Equalized flows are treated with microfiltration technology commonly used in the beverage and drinking water industry. The recycled water product from this treatment process is significantly more pure than the tertiary filters previously used by the District. This treatment technology is a precursor to the reverse osmosis treatment that will be added to the treatment process.

- Recycled Water Storage Reservoir - A 4.0-MG recycled water storage reservoir and pump station is used to store the recycled water prior to plant effluent.

Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place and quantity of use (California Water Code Section 10633(c)).

Recycled water used in the service area of the Yucaipa Valley Water District is currently produced at the Yucaipa Valley Regional Water Filtration Facility. The Yucaipa Valley Water District will be constructing a pipeline, reservoir and booster station to complete the recycled water system to the Wochholz Regional Water Recycling Facility. When this facility is completed in January 2014, the Yucaipa Valley Water District will be capable of using recycled water to meet the irrigation demands within the service area.

Currently, recycled water produced from the Wochholz Regional Water Recycling Facility is discharged into San Timoteo Creek.

Table 4-13 – Recycled Water – Potential Future Use

User type	Description	Feasibility[1]	2015	2020	2025	2030	2035 - opt
Agricultural irrigation	Minimal agricultural land use in the YVWD service area	Most likely agricultural land use will decrease	5.217	5.365	5.294	5.337	5.318
Landscape irrigation[2]	City of Yucaipa receives recycled water to irrigate parks and schools	Recycled system will expand to additional areas	58.373	121.829	191.115	200.388	210.581
Commercial irrigation[3]	Business districts within YVWD service area	Recycled system will expand to additional areas	18.911	39.468	61.915	64.919	68.221
Golf course irrigation	Yucaipa Valley Golf Course receives recycled water	Recycled water irrigation on golf course sites will continue	Included in Landscape Irrigation				
Wildlife habitat	n/a	YVWD is required to discharge 1.6 mgd into San Timoteo Creek, effluent will be replaced with groundwater	0	0	0	0	0
Wetlands	n/a	n/a	0	0	0	0	0
Industrial reuse	n/a	n/a	0	0	0	0	0
Groundwater recharge	Recharge advanced tertiary treated wastewater	Groundwater recharge with recycled water will increase	1,483				
Seawater barrier	n/a	n/a	0	0	0	0	0
Geothermal/Energy	n/a	n/a	0	0	0	0	0
Indirect potable reuse	n/a	n/a	0	0	0	0	0
Other (Hydrant Flushing)	YVWD and Fire Department conduct periodic testing and flushing of hydrants	This activity will continue	8.739	18.240	28.613	30.002	31.528
Other	n/a	n/a	0	0	0	0	0
Total							

Units: Million Gallons
[1]Technical and economic feasibility.
[2]Includes parks, schools, cemeteries, churches, residential, or other public facilities)
[3]Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses. (California Water Code Section 10633(d)).

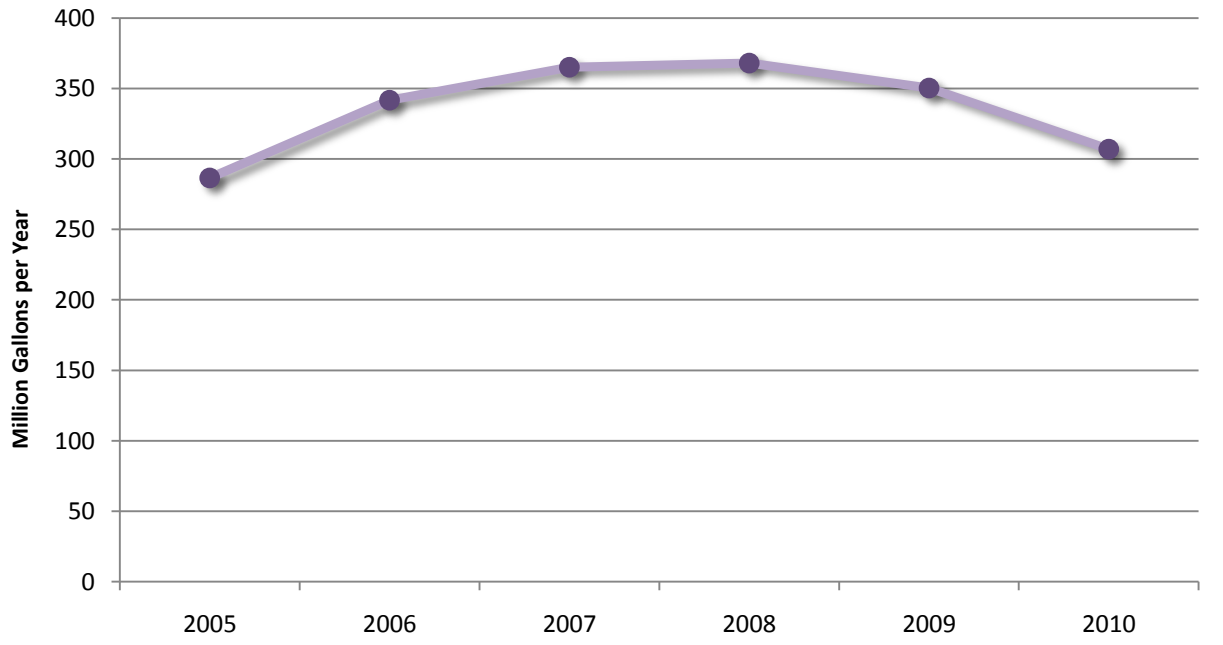
Currently, the District provides about 300-350 million gallons (920-1,075 acre feet) of recycled water per year. Since recycled water is used for irrigation purposes, the actual amount of recycled water fluctuates each year and is highly dependent on weather conditions.

Currently, the District meets our recycled water demands by treating the backwash water at the Yucaipa Valley Regional Water Filtration Facility. By 2013, the District will be adding another supply of recycled water to the Regional Conveyance System from the Wochholz Regional Water Recycling Facility. This source will contribute an additional 3.5 million gallons per day, or approximately 1,300 million gallons per year. As the Henry N. Wochholz Regional Water Recycling Facility (WRWRF) expands, the amount of recycled water generated from this facility will increase.

The WRWRF has a rated capacity of 6.67 mgd. Currently, treated effluent is conveyed through a land outfall and discharged to San Timoteo Creek. Three customers along the existing land outfall are receiving recycled water for irrigation purposes. Delivery amounts are expected to grow to about 6,700 acre-feet by 2020 or about 24 percent of total agency water demands. Ultimately, the District expects to deliver about 8,000 acre-feet per year of recycled water.

The potential exists for the District to increase the amount of water that is beneficially reused within the service area from the existing WRWRF facility. Additional environmental analysis on the potential impacts to San Timoteo Creek and surrounding areas is required before this can occur.

Figure 4-18 – Annual Recycled Water Demands



The Yucaipa Valley Water District is continuing to expand its non-potable water system to meet increasing demand in the system. The increasing demand is a result of additional golf courses, schools, community parks, and other non-potable water users, as well as increased residential development.

The existing (Phase I) non-potable water system went into operation in 2002, and currently makes use of two predominant water sources – including raw water from the State Water Project and local surface water from Mill Creek. Upon completion of the Phase II system improvements, the District will increase its recycled water supply by up to 8.0 million gallons per day of recycled water from the Henry N. Wochholz Regional Water Recycling Facility.

The District also plans the incorporation of seasonal storage into the overall system operation with the construction of a series of aquifer storage and recovery projects. The District will use both spreading basins and direct injection to address its seasonal storage needs. In the vicinity of the Wochholz Regional Water Recycling Facility, a series of aquifer storage and recovery wells will be constructed. In addition to these wells, the District will also have several spreading basins located throughout its service area for groundwater recharge with excess non-potable water. In the winter, when irrigation demands are low, the District will store excess recycled water from various water sources at its disposal, in the underlying groundwater basin. During high demand periods, groundwater recovery wells located adjacent to the Wochholz Regional Water Recycled Facility and various spreading basins will be used to supplement the system as additional recycled water supply.

The District also has several non-potable water wells throughout its service area that may also be used to recover stored water from the underlying groundwater basin. The recovered water supplies will be combined to serve the maximum day recycled water demand during high demand periods of the year.

In addition, the Yucaipa Valley Water District is currently conducting an environmental review to possibly extend the current Regional Recycled Water Conveyance System to the District's southernmost service area boundary. This extension would involve the construction of a 24" recycled water pipeline, approximately 18,500 linear feet (3.5 miles) through the City of Calimesa. The purpose of the pipeline is to provide recycled water service to customers within the District and provide surplus recycled water to neighboring water agencies such as the Beaumont Cherry Valley Water District and the City of Banning.

Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision (Public Water Code Section 10633(e)).

Table 4-14 - Recycled water — 2005 UWMP Use Projections Compared to 2010

Use type	2010 actual use	2005 Projection for 2010[1]
Agricultural irrigation	7.2	620.704
Landscape irrigation[2]	132.600	
Commercial irrigation[3]	10.000	
Golf course irrigation	166.400	
Wildlife habitat	1,277.500	584.000
Wetlands	0	0
Industrial reuse	0	0
Groundwater recharge	0	0
Seawater barrier	0	0
Geothermal/Energy	0	0
Indirect potable reuse		0
Total	1,586.500	1,204.704

Units of measurement are in million gallons
[1]From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.
[2]Includes parks, schools, cemeteries, churches, residential, or other public facilities)
[3]Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year (Public Water Code Section 10633(f)).

Recycled water is comprised of approximately 8% of Yucaipa Valley Water District's water portfolio as of 2010. Recycled water sources are expected to increase up to 30% of the total water sources utilized by the District by 2030. Financial incentives are provided to a recycled water customer. For example, under Yucaipa Valley Water District's current conservation pricing, a recycled water customer would pay approximately $0.20 - $1.20 less per one thousand gallons. However, this structure alone does not provide a measurable incentive to en

Table 4-15 – Methods to Encourage Recycled Water Use

	Projected Results					
Actions	2010	2015	2020	2025	2030	2035 - opt
Financial incentives	0	0	0	0	0	0
Total	0	0	0	0	0	0

Units of measurement are in million gallons

Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use (Public Water Code Section 10633(g)).

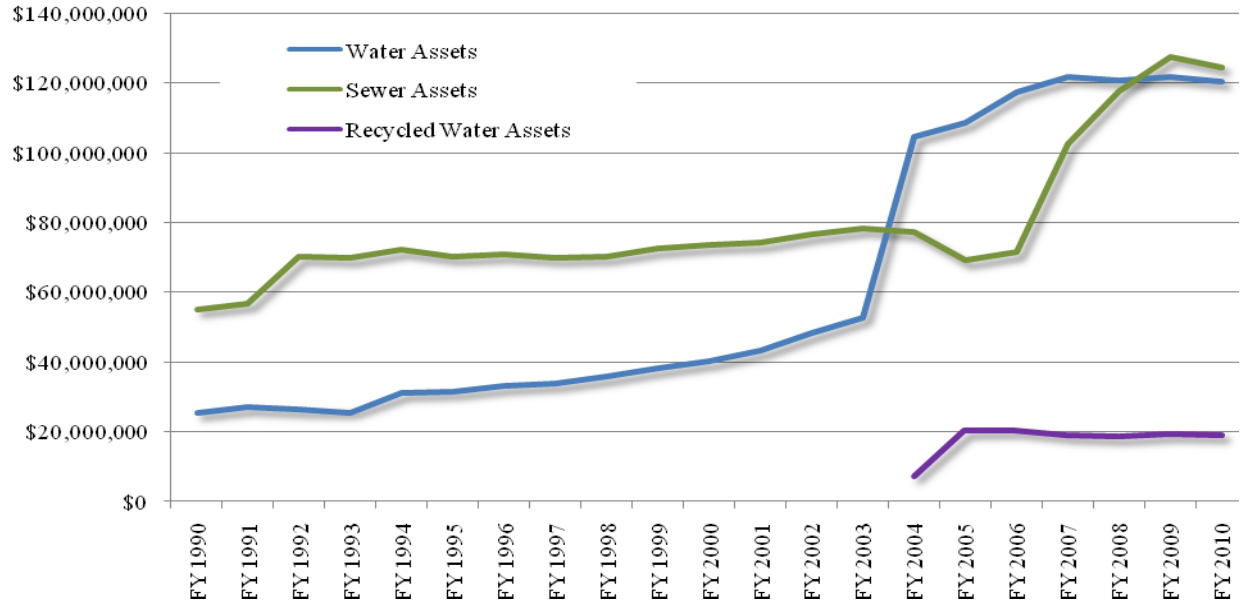
The Yucaipa Valley Water District is commuted to the construction of dual distribution facilities for potable water and recycled water.

4.9 Future Water Projects

Describe all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program (Public Water Code Section 10631(h)).

As shown below, the Yucaipa Valley Water District has been aggressively constructing a series of water and recycled water system improvements to ensure water supplies are available in drought years.

Figure 4-19 – Growth of Yucaipa Valley Water District Assets



Each year the Board of Directors adopts a series of projects to bolster the reliability of the water supply system. A copy of the District's Capital Improvement Budget is the best source of information for future water projects.

Section 5

Water Supply Reliability and Water Shortage Contingency Planning

5.1 Water Supply Reliability

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions. (California Water Code Section 10620(f)).

The Yucaipa Valley is located in the upper portion of the Santa Ana Watershed, south of Mill Creek and the Santa Ana River. By not having a significant watercourse in our Valley, the local groundwater basins do not refill with precipitation and melting snowpack as quickly as or neighboring agencies that benefit from the surface water recharge of the Santa Ana River and Mill Creek.

For this reason, water supply is clearly one of the most critical issues facing the Yucaipa Valley. In the past, the area has relied heavily on local sources of surface and groundwater for our supply. Continued growth has caused the water demands to exceed the locally available supply. The Yucaipa Valley Water District recognizes that in order for development to occur, there must be a reliable source of water delivered to meet the new demands in addition to the existing demands and replenishment required to recover the previously depleted groundwater basins.

This section is dedicated to developing a methodology to protect current customers while allowing new development to occur. It is necessary to establish priorities for the limited imported water supplies available in the state to ensure the continued growth and prosperity of the community. While some may view the proposed methodology as punitive, others recognize that the intent is to develop a reasonable mechanism that provides certainty to new development in spite of the failing infrastructure our imported water is dependent upon.

5.1.1 A Diversified Portfolio

Just like an individual's financial investment portfolio, the Yucaipa Valley Water District maintains a diversified portfolio of available water resources as a strategy to maintain a reliable water supply for existing and future customers. Specifically, the District has access to the following water supplies to meet existing and future water demands:

- Unadjudicated Ground Water Supplies
  - Crafton Subbasin
  - Gateway Subbasin
  - Triple Falls Subbasin
  - Oak Glen Subbasin
  - Wilson Creek Subbasin
  - Calimesa Subbasin

    - Singleton Canyon Subbasin
    - San Timoteo Subbasin
    - Western Heights Subbasin
    - Wildwood Subbasin
- Adjudicated Groundwater Supplies
    - Beaumont Storage Unit
- Surface Water Supplies
    - Oak Glen Surface Water
- Supplemental Water Supplies – Direct Delivery
    - Yucaipa Valley Regional Water Filtration Facility
    - Yucaipa Source - San Bernardino Valley Municipal Water District
    - Calimesa Source - San Gorgonio Pass Water Agency
- Recycled Water Supplies
    - Henry N. Wochholz Regional Water Recycling Facility
- Non-Potable Water Supplies
    - Groundwater sources not suitable for drinking water

While the Yucaipa Valley Water District relies on a variety of water resources, the most significant sources of imported water from northern California has recently become less reliable. To ensure sufficient water supplies exist for new development, it is important to provide a clear roadmap for developers and builders to understand the process for demonstrating a guaranteed source of water prior to receiving a building permit for construction.

This section focuses on an implementation strategy to allow new development to occur without creating a negative impact to the existing community under wet, normal and dry year conditions.

5.1.2 Overview of Water Supply Assessments

On October 9, 2001 Governor Gray Davis signed into law Senate Bills 610 (Costa) and 221 (Kuehl) that require a water supply assessment in conjunction with development project reviews under the California Environmental Quality Act (CEQA), and a written verification of water supply where a development is proposed for approval.

Since the implementation of Senate Bills 610 and 221, the Yucaipa Valley water District has prepared and adopted a number of water supply assessments for various projects within our service area. While the Yucaipa Valley Water District and the developers worked closely to develop a thoughtful, credible and specific strategy for the developments, the plans were quickly outdated with some developments adding residential units following the adoption of the water supply assessments and other plans being subjected to changed conditions due to changes in the reliability of imported water from the State Water Project.

To resolve these issues, the Yucaipa Valley Water District has developed the Water Resource Validation Program to apply to all new development within our service area, not just developments with 500 or more units.

The Yucaipa Valley Water District has reviewed the latest requirements for water supply assessments and has determined that this program will provide a sufficient water supply to serve the needs of all new development during normal, single dry, and multiple dry water years

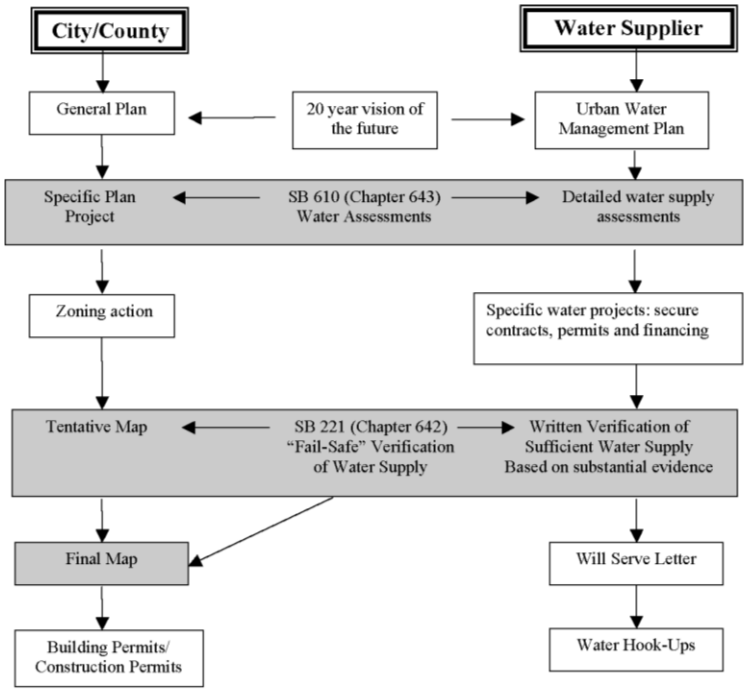
during a 20-year projection, in addition to existing and planned future uses, including agricultural and manufacturing uses.

5.1.2.1 Requirements of Senate Bill 221 and Senate Bill 610

The intent of Senate Bill 221 and Senate Bill 610 was to create additional assurance that certain new developments could be provided a reliable supply of water and that the effect of certain new developments upon existing water users both within the service area of the public water provider and those dependent on common sources of water were informed regarding the proposed water use, its impacts and plans to maintain reliable supplies. The legislation also serves to better inform decision makers regarding the water supply implications of development addressed by the measures.

The following chart illustrates the relationship between a local land use agency and the water supplier in their planning processes. The General Plan, prepared by a city or county planning department, and the Urban Water Management Plan prepared by a water supplier are the critical source documents used to substantiate the information required by Senate Bill 221 and Senate Bill 610 at the local level.

Figure 5-1 – Implementation of Senate Bill 610 and 221



Source: Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001, California Department of Water Resources, October 8, 2003, page v.

Senate Bill 221

Senate Bill 221 creates a specific requirement for a written verification that a sufficient supply of water exists for any residential development of 500 or greater units as a condition of approval of a tentative tract or parcel map. Local land use approval authorities may not approve such maps if a sufficient supply cannot be demonstrated. Under the statute, a sufficient supply is defined as the total water supply available during normal, single dry and multiple dry years within a 20- year projection that will meet the water suppliers existing and planned future uses (Government Code 66473.7(a)(2). This does not mean that 100 percent of the development's unrestricted water demand must be met 100 percent of the time, nor does it mean the new development may not have any impact on the service level of existing customers. A "sufficient water supply" may be found to exist for a proposed subdivision and for existing customers, even where a drought-induced shortage will be

known to occur, as long as a minimum water supply can be estimated and planned for during a record drought (ACWA, 2002).

Senate Bill 610

Senate Bill 610 (Costa) became effective January 1, 2002. The stated intent of SB 610 is to strengthen the process by which local agencies determine the adequacy and sufficiency of current and future water supplies to meet current and future demands. SB 610 amended the California Public Resources Code to incorporate Water Code findings within the CEQA process for certain types of projects, amended the Water Code to broaden the types of information included in Urban Water Management Plans ((UWMP) – Water Code Section 10620 et. seq.) and added to Water Code Part 2.10 Water Supply Planning to Support Existing and Planned Future Uses (Section 10910 et. seq.). Part 2.10 clarifies the roles and responsibilities of the Lead Agency under CEQA and the "water supplier" with respect to describing current and future supplies compared to current and future demands.

Overall, Senate Bill 610 requires that a water supply assessment be prepared for certain developments, including residential developments in excess of 500 units, where an environmental impact report or negative declaration is being prepared under CEQA. The requirement is one that adds a specific water supply assessment protocol for land use jurisdictions to follow and consider in evaluating the environmental impacts for a proposed project. The Water Supply Assessment must be included in any CEQA document prepared for the project.

5.1.3 Water Requirements for New Development

The Yucaipa Valley Water District will require all new development to provide bundled water, sewer and recycled water services for all new construction. Bundled services are a critical component in order for the District to make a firm commitment of water for at least two decades. This requirement is further discussed below.

Overall, the Yucaipa Valley Water District's water facilities are designed to serve single family, multi-family, commercial and industrial properties. The water required to serve each type of land use is related to the water required to serve one single-family residence, referred to as one Equivalent Dwelling Unit (EDU). Every service connection is assigned an EDU based on meter size and historical consumption data. When meter sizes have not yet been determined, as for the commercial developments, parks, and schools, consumption is based on acreage and historical data for water use per acre. The total consumption per parcel is then converted to EDU's.

Water demand criteria for new development was updated by the Board of Directors and included as the basis for the most recently adopted Water Master Plan. Resolution No. 32-2002 set demand requirements for facility design as follows:

- Average Day Demand (gallons) = (Number of EDU's) x (700 gallons per day per EDU)
- Maximum Day Demand = 200% of Average Day Demand
- Peak Hour Demand = 400% of Average Day Demand

A key component within the 2005 Water Master Plan is the District's commitment to utilizing recycled water. The Board of Director's have adopted a policy stating "…recycled or other non-

potable water be used, for any purpose approved for non-domestic water use, to the maximum extent possible." Use of recycled water will have the following direct benefits:

- Reduced dependency on high quality ground water;
- Preservation of ground water supplies for potable use;
- Reduced dependency on imported water from Northern California; and
- Reduced operating cost of the Yucaipa Valley Regional Water Filtration Facility.

Table 5-1 - Dual Plumbed Home Water Allocation for a Typical Residential Dwelling Unit

Water Type	Percentage of Total Demand	Gallons per Day (per EDU)
Potable Water	40%	280
Non-Potable Water	60%	420
Total Water Demand	100%	700

Based on this policy, all new developments with recycled water accessible will be required to connect to recycled water infrastructure to irrigate all greenbelt areas, commercial landscape areas, roadway medians, front yards of individual homes and rear yards of individual homes. The benefits to the development include:

- An additional highly reliable, drought tolerant water source; and
- Reduction in the Yucaipa Valley Regional Water Filtration Facility Development Impact Fees.

Based on analyses of similar dual plumbed water systems in other water agencies, the potable water demand for a standard residential home will be estimated at 40% of the regular total water demand, reduced by 60% through the use of non-potable water for outside irrigation. Therefore, potable water facilities will be reduced from the District's standard design criteria of 700 gallons of total water per day per EDU to 280 gallons of potable water per day per residential EDU.

Based on an analysis of similar dual plumbed water systems in other water agencies, the non-potable water demand makes up approximately 60% of the total residential water demand. Therefore, non-potable facilities will generally be sized at 420 gallons per day per residential EDU.

Table 5-2 - Water Demand Analysis for a Typical Residential Dwelling Unit

Water Demand	Gallons (per EDU)	Acre Feet (per EDU)
Total water demand for one day	700	0.00215
Total water demand for one year	255,500	0.784
Total water demand for twenty years	5,100,000	15.68

The total water demand for a standard residential unit (EDU) will require over five million gallons of water (5,100,000 gallons) per unit over a twenty year period. Considering the quantity of water needed for each new home, the Board of Directors has recognized the need to implement the Water Resource Validation Program for each new unit of residential, commercial, institutional, and industrial development.

Crystal Status Development Program

With the implementation of the Crystal Status Development Program, the Yucaipa Valley Water District (or District) will have sufficient water supplies to meet the needs of existing and future customers within our service area. Specifically, this program will provide sufficient water supplies to serve the needs of all new development during normal, single dry, and multiple dry water years during a 20-year period, in addition to existing and planned future uses, including agricultural and manufacturing uses.

The Crystal Status Development Program will rely upon the use of several groundwater basins currently under the management and control of the Yucaipa Valley Water District and our neighboring water providers to ensure a sufficient water supply exists for existing customers and new development. The intent of the Program is to provide the development community with a water supply that is credible, reliable, and robust such to minimize challenges while ensuring existing customers are not adversely impacted by the demand for water by new development.

5.2 Water Supply Reliability Strategy

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable (California Water Code Section 106319(c)(2))

Through build-out, Yucaipa Valley Water District will provide a reliable supply of water to serve the community, despite rapidly growing water demands. This will be accomplished by prioritizing the importation of water based on availability in the following order:

- Priority One – Direct Delivery for Existing Customers. The direct delivery of imported water to meet the needs of existing potable water and non-potable water demands will be the highest priority of the District. This priority ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the existing direct delivery demand, imported water will be allocated to the next priority.

- Priority Two – Groundwater Adjudication Obligations. The District is responsible for meeting the obligations of groundwater adjudications in the Beaumont and Yucaipa Basins. This is the second highest priority to ensure sufficient storage and replenishment obligations under court orders have been achieved. This priority also ensures sufficient water supply is allocated to meet current water demands. If the supply of imported water exceeds the first and second priorities, imported water will be allocated to the following priority.

- Priority Three – Groundwater Banking for Future Reliability. The Board of Directors will establish a groundwater banking of 15% of the total water used by District customers to recover our groundwater basins for future reliability. Each month, customers will be charged the cost for importing an additional 15% of the water consumed. The water will be stored in the groundwater basins to establish a credit and future drinking water supply to allow the community to use this local source during times of droughts and disruptions to the State Water Project. As with the first two priorities, this third priority also ensures

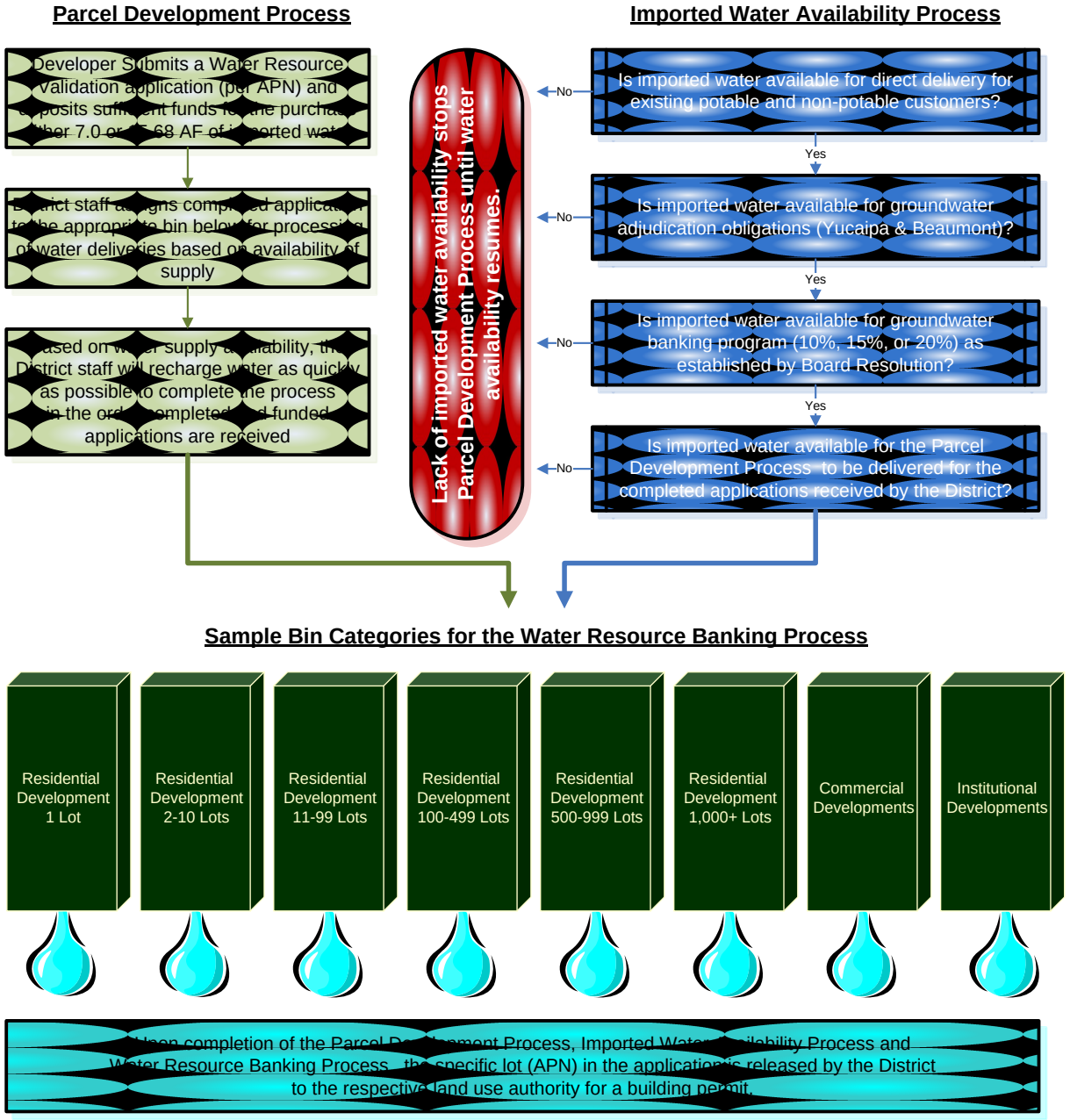
sufficient water supply is allocated to meet current water demands, and is different from the Parcel Development Process needed for new development to occur. If the available supply of imported water exceeds the first, second and third priorities, imported water will be allocated to the following priority.

- Priority Four – Parcel Development Process. The Parcel Development Process provides for the storage of 7.0 acre-feet per EDU for all new developments and 15.68 acre feet per EDU of imported water for the Crystal Status Development Program. This water is sufficient to clearly demonstrate a 20-year supply of water is available for the development to occur. The cost of imported supplemental water will be linked directly to the availability and anticipated cost for water delivered by either the San Bernardino Valley Municipal Water District or the San Gorgonio Pass Water Agency as established by the Yucaipa Valley Water District.

Based on this strategy, new development will contribute to the capital assets of the Yucaipa Valley Water District as well as the water supply strategy to ensure a long-term and reliable water supply is available. This strategy allows the Yucaipa Valley Water District to serve its customer's water demands entirely through groundwater or surface water allowing the District to insulate itself from periodic drought by utilizing available surface waters in wetter years relying more on groundwater in dryer years when surface water is less available. The District is able to switch between the two sources, or use both sources simultaneously, depending on hydrology and water availability.

Surface supply availability from the SWP, San Bernardino Basin Bunker Hill Pressure Zone, Seven Oaks Dam, Mill Creek and Santa Ana River can be used interchangeably, depending upon local and statewide hydrology, to supplement a stable local groundwater yield. Additionally, the District will incorporate recycled water delivery systems into new development, focusing service of new irrigation demands on recycled water. Recycled water will give the District a new local source of water of high reliability, both lessening the dependence on imported sources and increasing reliability of total supply.

Figure 5-2 – Yucaipa Valley Water District Building Permit Procedure



5.3 Supply and Demand Comparisons

The UWMP Act requires urban water suppliers assess water supply reliability by comparing total projected water use with the expected water supply over the next twenty years in five year increments. The Act also requires an assessment of single-dry year and multiple-dry years. This section presents the reliability assessment for the Yucaipa Valley Water District's service area.

Table 5-3 - Local Surface Water Supplies – Normal, Single-Dry, and Multiple Dry Years

Surface Water	2015	2020	2025	2030	2035
Normal Year - Oak Glen Creek	114	114	114	114	114
Single Dry Year Oak Glen	57	57	57	57	57
Multiple-Dry Year Oak Glen	57	57	57	57	57
Total Local Surface Supplies, Normal, Single and Multiple Dry Years	228	228	228	228	228

Table 5-4- Minimum Water Supply Available During Next Three Water Years (AFY)

Minimum Water Supply	2011	2012	2013
Purchased Imported Water	1,630	1,630	1,630
Groundwater	3,749	3,749	3,749
Surface Water	57	57	57
Transfers/Exchanges	0	0	0
Recycled Water	1,483	1,483	1,483
Total Supply	6,919	6,919	6,919

5.3.1 Normal Water Year

The normal or average water year is a year in the historical sequence that most closely represents median runoff levels and patterns. This section summarizes The Yucaipa Valley Water District's water supplies available to meet demands over the 20-year planning period during an average/normal year and compares them to demands for the same period.

In the table below, demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions. This information demonstrates that the Yucaipa Valley Water District anticipates adequate supplies for years 2015 to 2035 under normal conditions.

Table 5-5 Projected Average/Normal Year Supplies and Demands

	2015	2020	2025	2030	2035
Existing Supplies					
Wholesale Imported	3,159.592	3,438.322	3,761.714	4,095.864	4,508.254
Groundwater	3,944.600	4,727.000	4,727.000	4,727.000	4,727.000
Local Surface Water	114.100	114.100	114.100	114.100	114.100
Recycled Water	1,483.300	1,612.396	1,787.458	1,964.476	2,087.378
Transfers/Exchanges	0.000	0.000	0.000	0.000	0.000
Total Existing Supplies	8,701.592	9,891.818	10,390.272	10,901.440	11,436.732
Planned Supplies					
Wholesale Imported	0.000	0.000	0.000	0.000	0.000
Groundwater	0.000	521.600	1,043.200	1,043.200	1,043.200
Local Surface Water	0.000	0.000	0.000	0.000	0.000
Recycled Water	0.000	0.000	0.000	0.000	0.000
Transfers/Exchanges	0.000	0.000	0.000	0.000	0.000
Total Planned Supplies	*0.000*	521.600	1,043.200	1,043.200	1,043.200
Total Existing and Planned Supplies	**8,701.592**	**10,413.418**	**11,433.472**	**11,944.640**	**12,479.932**
Demands without Additional Conservation	6,789.928	7,093.760	7,414.544	7,707.618	7,971.678
Conservation	678.993	1,418.752	1,482.909	1,541.524	1,594.336
Total Adjusted Demands	6,110.935	5,675.008	5,931.635	6,166.094	6,377.342
Surplus/Deficit in Single-Dry Year	2,590.657	4,738.410	5,501.837	5,778.546	6,102.590
Difference as % of Supply	30%	46%	48%	48%	49%
Difference as % of Demand	42%	83%	93%	94%	96%

Units in Million Gallons

5.3.2 Single-Dry Year

The single-dry year is generally the lowest annual runoff for a water source in the record. The single-dry year may differ for various sources.

This section summarizes the Yucaipa Valley Water District's water supplies available to meet demands over the 20-year planning period during a single-dry year and compares them to demands for the same period. In the table below, demands are assumed to be 10 percent greater in a single-dry year than during a normal year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions.

This table demonstrates that the Yucaipa Valley Water District anticipates adequate supplies for years 2015 to 2035 under single-dry year conditions.

Table 5-6 Projected Single Dry Year Supplies and Demands

	2015	2020	2025	2030	2035
Existing Supplies					
Wholesale Imported	1,630.000	1,630.000	1,630.000	1,630.000	1,630.000
Groundwater	3,749.000	3,749.000	4,792.200	4,792.200	4,792.200
Local Surface Water	57.050	57.050	57.050	57.050	57.050
Recycled Water	1,483.300	1,612.396	1,787.458	1,964.476	2,087.378
Transfers/Exchanges	0.000	0.000	0.000	0.000	0.000
Total Existing Supplies	6,919.350	7,048.446	8,266.708	8,443.726	8,566.628
Planned Supplies					
Wholesale Imported	0	0	0	0	0
Groundwater	0.000	521.600	1,043.200	1,043.200	1,043.200
Local Surface Water	0	0	0	0	0
Recycled Water	0	0	0	0	0
Transfers/Exchanges	0	0	0	0	0
Total Planned Supplies	*0.000*	521.600	1,043.200	1,043.200	1,043.200
Total Existing and Planned Supplies	**6,919.350**	**7,570.046**	**8,266.708**	**8,443.726**	**8,566.628**
Demands without Additional Conservation	7,468.986	7,803.136	8,155.868	8,478.282	8,768.748
Conservation	746.899	1,560.627	1,631.174	1,695.656	1,753.750
Total Adjusted Demands	6,722.087	6,242.509	6,524.694	6,782.626	7,014.998
Surplus/Deficit in Single-Dry Year	197.263	1,327.537	1,742.014	1,661.100	1,551.630
Difference as % of Supply	3%	18%	21%	20%	18%
Difference as % of Demand	3%	21%	27%	24%	22%

Units in Million Gallons

5.3.3 Multiple-Dry Years

The multiple-dry year is generally the lowest annual runoff for a three year or more consecutive period. The multiple-dry year period may differ for various sources.

This section summarizes the Yucaipa Valley Water District's water supplies available to meet demands over the 20-year planning period during a multiple-dry year period and compares them to demands for the same time frame. In the table below, demands are assumed to be 10 percent greater in a multiple-dry year than during an average year. Demands are shown with and without the effects of the assumed demand reduction resulting from conservation actions.

This table demonstrates that the Yucaipa Valley Water District anticipates adequate supplies for years 2015 to 2035 under multiple-dry year conditions.

Table 5-7 Projected Multiple-Dry Year Supplies and Demands

		2015	2020	2025	2030	2035
Multiple-Dry Year First Year Supply	Supply Totals[(a)]	23,349	23,221	25,358	25,901	26,278
	Demand Totals[(b)]	20,620	19,149	20,015	20,806	21,519
	Difference	2,729	4,072	5,343	5,095	4,759
	Difference as % of Supply	12%	18%	21%	20%	18%
	Difference as % of Demand	13%	21%	27%	24%	22%
Multiple-Dry Year Second Year Supply	Supply Totals[(a)]	23,349	23,221	25,358	25,901	26,278
	Demand Totals[(b)]	20,620	19,149	20,015	20,806	21,519
	Difference	2,729	4,072	5,343	5,095	4,759
	Difference as % of Supply	12%	18%	21%	20%	18%
	Difference as % of Demand	13%	21%	27%	24%	22%
Multiple-Dry Year Third Year Supply	Supply Totals[(a)]	23,349	23,221	25,358	25,901	26,278
	Demand Totals[(b)]	20,620	19,149	20,015	20,806	21,519
	Difference	2,729	4,072	5,343	5,095	4,759
	Difference as % of Supply	12%	18%	21%	20%	18%
	Difference as % of Demand	13%	21%	27%	24%	22%

Units in Million Gallons

5.4 Water Shortage Contingency Planning

Water conservation is more than just restricting water use. Water conservation is the efficient use of water through conservation measures and increased efficiency. Implementing water conservation allows water utilities to avoid the cost of building additional drinking water facilities and reasonably expands the use of water resources. Water conservation is one of the last options available for communities to continue the long tradition in America of cheap, available water. Inexpensive and readily available water supplies are often taken for granted while in many parts of the world this luxury is unique.

> *Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster (California Water Code Section 10632(c))*

The objective of Water Shortage Contingency Planning is to establish actions and procedures for managing water supply and demands during water shortages. The plan would help the District maintain essential public health and safety and minimize adverse impacts on economic activity, environmental resources and the region's lifestyle.

This plan complements the District's Emergency Response Plan. That plan is an emergency plan that defines decision making authority in emergencies and creates specific emergency action plans for a number of systems, security, and management procedures.

As part of the Emergency Response Plan, the District would provide a unified incident command center as a disaster response command team at the Administration Building. These team leaders will determine policies and strategies for handling major disasters. Individual departments, working on a common incident, will coordinate their field efforts through the incident command structure.

While water supply disruptions can occur for a variety of reasons, a weather related water shortage, or drought, is one category of particular importance to the Yucaipa Valley Water District for reasons described below. Droughts are naturally occurring but unpredictable weather events of varying frequency, duration and severity. In the Yucaipa Valley, historical data indicates a high probability of short term and/or multi-year drought conditions.

This region is generally faced with a relatively dry summer period with very little rainfall occurring during the summer months. Most of the annual 16 inches of precipitation occurs during the fall and winter months from November to April, with most of the rainfall occurring in February. Since the Yucaipa Valley Water District is typically reliant on local surface water and groundwater, the amount of precipitation received in the Yucaipa Valley is extremely important to recharge our underground water basins. Certain weather events that can affect this cycle may manifest in one or more of the following ways:

- Less than normal winter precipitation and snowpack in the Yucaipa Valley, this would limit the quantity of water available at the Oak Glen Surface Water Filtration Facility and ultimately reduce the amount of groundwater recharge.
- Unusually warm spring weather bringing with it early melting of the snowpack, resulting in early drawdown of the mountain resources.
- Unusually hot and dry summer weather, which can significantly increase peak season demands.
- A delayed return of the fall rains, or a dry winter, which can delay the fall percolation refill cycle (which replenishes the underground storage reservoirs after the peak season).

Yucaipa Valley Water District's strategy for dealing with the hydrologic uncertainty associated with drought management and related emergency issues involve several components:

- **Information** - To deal with hydrologic uncertainty in real-time and in longer term planning horizons, the District's management team uses a number of available informational and data gathering sources. One of the most valuable resources used by the District is the California Department of Water Resources Data Exchange Center. This center provides real time data at the California Department of Forestry Fire Station located on Highway 38.

- **Forecasting** - Through the National Oceanic and Atmospheric Administration (NOAA), the District regularly monitors daily weather forecasts, mid-range weather forecasts, 30- and 90-day and multi-season climate outlooks. The Internet has greatly improved access to these sources of information. For example, NOAA's El Niño Theme Page on the Internet provides a wealth of timely information on current and forecasted El Niño and La Niña conditions with enough lead time for the District to prepare for such events.

- **Communication** - The District's management team works closely with members of other local, state, and federal agencies including the City of Yucaipa, City of Calimesa, County of San Bernardino, County of Riverside, U.S. Army Corps of Engineers. The local agencies meet once a month to discuss several issues related to the Yucaipa Valley,

including hydrologic conditions, facility and system operations, and other subjects as may be beneficial in managing our water supplies.

- **Dynamic operating rules** - Operational flexibility is key, with operating plans changing as conditions and forecasts change. Dynamic groundwater pumping and reservoir storage settings are continuously monitored and modified to best fit the daily temperature forecasts. All of the tools, information sources and communications outlined above, are needed for coordinating and decision making related to real-time operations.

5.4.1 Principles of the Water Conservation Strategy

The Yucaipa Valley Water District's Water Conservation Implementation Plan, is based on the following principles:

- Given clear, timely and specific information on supply conditions and the necessary actions to forestall worsening conditions, customers prefer the opportunity to meet targeted demand reduction levels through voluntary compliance measures. The decision to move to mandatory restrictions is more acceptable if the voluntary approach has been tried first but has not resulted in enough demand reduction to ensure public health and safety through the projected duration of the shortage.

- Each drought or other shortage situation has enough unique characteristics that a plan cannot specifically define all the scenarios and specific supply and demand management actions. The usefulness of a Water Conservation Implementation Plan lies in planning the range of supply and demand management actions in advance of the situation, and in defining the communication mechanisms by which decisions will be made during the event.

- Given the effective long-term conservation program operated by the District, it is important to distinguish between the short term curtailment measures necessitated by a water supply disruption, and the conservation measures YVWD promotes to its customers. Conservation focuses on efficiencies, which do not affect the quality of life, whereas curtailment measures can involve short-term actions, which could impact it.

- It is essential to closely monitor water quality during a supply disruption and particularly during a warm weather drought. Water quality issues must be considered when supply management decisions are made.

5.4.2 Alternative Water Supplies

Depending on the nature and timing of a potential water shortage, alternative water supplies may be useful to supplement existing supplies.

- **Interties** - Since water supply disruptions may not affect all water suppliers to the same extent, it is sometimes feasible for the District to obtain water from other providers through interties, where they exist.

- **Recycled Water** – Yucaipa Valley Water District recognizes the value of recycled water as a means to conserve and extend the useful life of the potable water supply. Recycled

water is the use of highly treated effluent instead of potable water for irrigation, street washing, construction purposes, etc. in order to reduce demand for potable water and lessen the impact of shortages on the community. It is important to note, that as recycled water becomes more widely available through the District's proposed recycled water facilities, the District will rely more heavily on it as a back-up supply for non-potable uses.

5.4.3 Phased Curtailment Plan

This plan provides four stages of response based of increasing severity, as progressively more serious conditions warrant. This type of response would be appropriate to a summer drought or other long-range disruption. The four stages include a variety of communications, internal operations, and supply and demand management strategies as appropriate, and are characterized as follows:

- **Advisory Stage** -The public is informed as early as meaningful data are available that a possible shortage may occur.

- **Voluntary Stage** - If supply conditions worsen, the plan moves to the Voluntary Stage, which relies on voluntary cooperation and support of customers to meet target consumption goals. During this stage, specific voluntary actions are suggested for both residential and commercial customers.

- **Mandatory Stage** - If the Voluntary Stage does not result in the reduction needed, the Mandatory Stage prohibits or limits certain actions. This stage would be accompanied by an enforcement plan, which could include fines for repeated violation.

- **Emergency Curtailment** - This addresses the most severe need for demand reduction and could include a combination of mandatory measures and rate surcharges. This could be used as the last stage of a progressive situation, such as a drought of increasing severity, or to address an immediate crisis, such as a facility failure.

Recommendations about implementing the Water Conservation Implementation Plan would be made to the General Manager, based upon recommendations by District staff. The General Manager would then inform the members of the Board of actions taken or approval to implement specific strategies depending upon the severity of the situation. Prior to making a recommendation, the District staff would consider the following factors in making its recommendations:

- Total supply availability, including groundwater, interties, and other available water supplies;
- The rate of decline in total reservoir storage compared with the normal operating rule curve;
- Short and long term weather forecasts by the NOAA National Weather Service;
- Computer modeling of weather and demand assumption data;
- The trends and forecasts of the system's daily water demands;
- The estimated margin of safety provided by the demand reduction, compared with the level of risk assumed if no action is taken;
- The value of lost water sales revenue compared with the increased margin of reliability;

- The length of time between stage changes (abrupt starts and stops are to be avoided), and required time lags to shift administrative gears and institute program (printing, purchasing, etc.);
- Current events;
- Customer response.

ADVISORY STAGE

Objectives

- To prepare the cities, school district, developers and water users for potential water shortage thereby allowing all parties adequate planning and coordination time.
- To undertake supply management actions that forestalls or minimizes the need later for more stringent demand or supply management actions.

Triggers

- As presented earlier, there are a variety of weather and other conditions that may cause concern about water availability and a potential water shortage. The most fundamental weather condition that would trigger an "Advisory" would be when the winter season rainfall total is significantly less than the average annual rainfall of 18 inches per year for Yucaipa (as measured at the Mill Creek CDF Fire Station).
- The Advisory would be withdrawn when projected water supplies such as State Water Project water and/or recycled water are in sufficient supply to provide normal water supply conditions to the District's customers.

Public Message

- "The potential exists for lower than normal supply; conditions may return to normal or, later on, we may need to reduce consumption. We'll keep you informed."

Advisory Stage Goal

- Voluntary conservation measures resulting in a 5% - 10% reduction in water use, which can generally be achieved by reducing residential landscaping, and irrigation use.

Advisory Stage Action Plan

- Brief elected officials
- District staff to issue a water conservation press release/newsletter during the summer months as a reminder to customers. See the sample press release as provided in Attachment "A".
- District adds text to monthly billing to remind customers of water conservation practices. An example would be:
- "During the summer months, please remember not to water between the hours of 10:00am and 8:00 pm. Thank you for conserving".
- District staff to regulate construction meter activity. This may include restricting quantity of water used and the issuance of new construction meters.
- District staff to monitor and record potable water irrigation practices at golf courses, parks and schools to effectively regulate the use of limited potable supplies.

- District staff to encourage the use of recycled water as a means to remain drought tolerant and promote continuous water conservation measures.
- Weekly planning meetings to include updates on water supply issues and alternatives to prepare for the next stage of the implementation plan.
- Intensify ongoing media education effort about the water system, particularly relationship of weather patterns to supply and demand; provide up to date data and implications for water use, if known.

YVWD Internal Operations for Advisory Stage

- Prepare to establish purveyor "hotline", a frequently updated recording providing latest information and supply and demand data.
- Consult with other major customer groups, e.g., parks departments, landscape industry, forming a committee if needed, to assist the shortage advisory group to define message and provide feedback on utility actions.
- Initiate status report to entities with special interests, e.g., large water users especially landscape and nursery industry, parks, major water using industries.
- Prepare public information materials explaining the Water Conservation Implementation Plan stages and range of actions; prepare "Questions and Answers" for all customer groups, including those who may be planning new landscaping projects.
- Intensify coordination with other regional water suppliers to learn what conditions they are projecting for their systems.
- Evaluate ability, resources, and plans to move into Voluntary stage; as appropriate, begin preparatory measures.
- Intensify data collection actions (storage reservoirs, wells and power supply) and monitoring weather forecasts.
- Intensify the District's computer modeling runs of projected supply, storage and demand scenarios.
- Intensify supply side management techniques to optimize existing sources.

- Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply.
- Assess water quality in reservoirs and distribution system to target for correction areas that may be predicted to experience problems.
- Initiate planning and preparation for Voluntary Stage actions, including an assessment of potential staffing impacts, training needs, and communications strategies including use of web-based information

VOLUNTARY STAGE

Objectives

- To maintain or reduce demand to meet target consumption levels by customer voluntary actions.
- To forestall or minimize need later for more stringent demand or supply management actions
- To minimize the disruption to customers' lives and businesses while meeting target consumption goals

- To maintain the highest water quality standards throughout the shortage.

Triggers

- The "Voluntary Stage" is implemented when one or both of the following factors applies:
  - Supply conditions identified in the Advisory Stage have not improved.
  - Demand levels indicate the need for a more systematic response to manage the situation
- Heavy groundwater pumping coupled with higher summer temperatures means that there might be an increased likelihood that water quality problems may become an issue. Consideration will be given to potential water quality issues in defining the supply and demand management strategies.

Public Message

"We are relying on support and cooperation of all water users to stretch the available water supply. Demand needs to be reduced by 10-15%. Customers are responsible for determining how they will meet that goal. Water waste is not allowed. If everyone cooperates, we may avoid imposing more stringent restrictions."

Voluntary Stage Goal

At this stage, the goal would be to achieve a 10% - 15% reduction in water use. Customers can generally achieve this goal through constant water conservation practices.

Voluntary Stage Action Plan

The District staff shall meet frequently to re-evaluate the situation based on current and projected supply conditions and the season, and determine the appropriate actions and strategies. The staff will determine target consumption goals to be achieved on a voluntary basis, which may be revised as necessary. (See attachment B) Based on the consumption goal, some or all of the following actions will be taken; those actions that are asterisked (*) will be considered initially for implementation if demand reductions more than 10 to 15 percent below normal are necessitated, or later if voluntary measures implemented fail to deliver targeted savings.

- Establish systematic communications with elected officials at the committee and Board level to communicate the nature and scope of voluntary measures and strategy
- District staff to evaluate whether targeted consumption levels and supply conditions warrant a rate surcharge to reinforce voluntary actions and/or to recover revenue losses*; the General Manager makes recommendation to Board members
- Prepare appropriate legislation regarding emergency surcharges, if required
- Consult with customer groups throughout the shortage to help develop public information messages and materials and to obtain feedback on utility actions
- Initiate major public information, media and advertising campaign:
  - In daily newspapers, publish and promote consumption graph that displays the goal and previous 24 hour consumption;
  - Promote consumption goals for typical households, and a percentage reduction goal for commercial customers (Attachment C contains a list of recommended actions for customers to take to reduce consumption)

  - Develop and implement a marketing plan, including paid advertising, to keep customers informed about supply and demand conditions; reinforces desired customer actions; recommends customer actions to reduce demand sufficiently; and, depending on conditions, reminds customers that if goals are not achieved, restrictions may be necessary

- Identify what potential next steps will be to reduce demand including timing, what type of restrictions and/or surcharges will be imposed.
- Establish routine timing for press releases (e.g., every Monday morning) that provide current status and outlook; present information in standardized format that becomes familiar to media and public.
- Include water quality information in public information so that if flushing is necessary, the public understands that it is essential for water quality maintenance.
- Publicize the water supply conditions web page, which is updated regularly. Ensure the information provided covers the needs of all key interests: the public, news media and purveyors.
- Meet with landscape industry representatives to inform them of current and projected conditions; develop partnership programs and informational materials on the shortage, consumption goals, etc. for distribution by industry and utilities.
- Establish and promote "hotlines" for customers to obtain additional conservation information.
- Contact largest customers to request percentage reduction. Contact City and other public agencies to inform them of conditions and request their cooperation.
- Prepare list of commercial car wash facilities that recycle water
- Establish regular communication mechanism to keep Department employees, especially utility account representatives and water service consultants, up to date on goals, conditions, and actions
- Print generic postcards to acknowledge receipt of customer correspondence regarding the shortage and to inform customer that specific response is being prepared
- Initiate remaining planning and preparation for Mandatory Stage

<u>YVWD Internal Operations for Voluntary Stage</u>

- Continue actions listed in the Advisory Stage.
- Eliminate all operating system water uses determined not to be essential to maintain water quality such as pipeline flushing, reservoir overflows; complete cleaning of any reservoirs known to be vulnerable to warm weather taste and odor concerns.
- Increase water quality monitoring actions.
- Implement staffing reassignments as needed, and plan staffing changes, which may be needed for the Mandatory Stage, including staff to enforce mandatory restrictions.

<u>Supply and Demand Management Actions</u>

- Issue a request that non-recirculating fountains be turned off*
- Restrict construction meters to only essential purposes*
- Activate any existing interties to increase supply availability*
- Request that Fire Department limit training exercises that use water
- Request that City agencies eliminate washing fleet vehicles unless recycling car washes are used

- Request that hosing sidewalks, driveways, parking lots, etc. be limited to situations that require it for public health and safety
- Have YVWD field personnel "tag" observed obvious water waste such as hoses without shutoff nozzles, gutter flooding, etc. with notice that informs customer about the supply conditions and need to conserve
- Evaluate ability to accelerate or enhance or expand long term conservation programs; implement as appropriate

MANDATORY STAGE

Objectives

- To achieve targeted consumption reduction goals by restricting defined water uses.
- To ensure that adequate water supply will be available during the duration of the situation to protect public health and safety
- To minimize the disruption to customers' lives and businesses while meeting target consumption goals.
- To maintain the highest water quality standards throughout the shortage.
- To promote equity amongst customers by establishing clear restrictions that affect all customers

Triggers

The General Manager, with approval from the Board of Directors, would approve progression to this stage if goals established in the Advisory and Voluntary Stage have not been met, and additional action is needed. The specific restrictions imposed during the mandatory stage would be determined based on the season of the year, targeted demand levels, and other considerations previously mentioned. Variations of the specific restrictions may be applied based on water supply conditions. For example, lawn watering restrictions may simply consist of time of day restrictions; or, if conditions warrant, lawn watering could be restricted to certain times of day and allowed only once a week.

Public Message

"It is necessary to impose mandatory restrictions to reduce demand based on the current water shortage. We are continuing to rely on the support and cooperation of the public to comply with these restrictions but need the certainty and predictability of restricting certain water uses in order to ensure that throughout the duration of this shortage an adequate supply of water is maintained for public health and safety."

Mandatory Stage Goal

Mandatory conservation measures resulting in a 10% - 15% reduction in water use.

Mandatory Stage Action Plan

- The District staff will make recommendations regarding the nature, scope and timing of restrictions to the members of the Water Conservation Committee. The District staff will need to determine that the water supply and demand management strategies will not result in unacceptable water quality degradation.
- The General Manager recommends to the Board of Directors to implement the Mandatory Stage conservation measures and other appropriate actions.

- The Board adopts a resolution on mandatory restrictions and, if needed and not already in place, emergency surcharges.
- The public is informed about the nature and scope of the mandatory restrictions through a press conference, paid advertising and other means, including direct mail.
- The enforcement mechanisms, rate surcharges, target consumption goals, projections for how long restrictions will be in place and the reasons for imposing restrictions will also be identified, as will the possible consequences if goals are not met.
- Any exemptions from restrictions will be clearly identified.
- In communicating mandatory restrictions to the public, a clear distinction will be made between lawn/turf watering and watering gardens and ornamental plantings. The type and amount of watering allowed will be clearly defined.
- A "Customer Hotline" will be set up to report violations of restrictions.
- Customers who irrigate with private wells will be urged to install signs to let the public know that private well water is being used.
- Communication actions from the Advisory and Voluntary stages will be continued and enhanced.
- Plans will be made to move into the fourth stage - Emergency Curtailment - and to begin preparatory measures as appropriate

YVWD Internal Operation Plan for Mandatory Stage

- Continue appropriate actions from previous stages
- Finalize and implement procedures for exemptions from restrictions and/or emergency surcharges.
- Finalize and implement enforcement procedures for restrictions including highly visible "Water Watchers". (See Attachment __)
- Increase water quality monitoring actions at storage reservoirs.

Supply and Demand Management Actions

Overall supply conditions will be considered at regular meetings by District staff and the members of the water conservation committee in evaluating which restrictions to impose.

POSSIBLE WATER CONSERVATION RESTRICTIONS

Watering Restrictions

The following are several possible approaches to watering restrictions. The nature of the restrictions used will depend on the situation, and may change as severity of the situation changes.

- Prohibit all watering during the day, for example between 6:00 a.m. and 9:00 p.m.
- Limit all watering to a specific number of days per week or per month. This choice will depend on target consumption goals, the time of year and the extent to which watering is occurring, and how much demands have already decreased.

Other Restrictions

- Prohibit use of any ornamental fountain using drinking water for operation or make-up.
- Prohibit car washing except at commercial car wash facilities that recycle water.
- Rescind water construction meter hydrant permits.

- Prohibit washing of sidewalks, streets, decks or driveways, except as necessary for public health and safety.
- Limit pressure washing of buildings to situations that require it as part of scheduled building rehabilitation project (e.g., painting).
- Prohibit water waste including untended hoses without shut-off nozzles, obvious leaks and water running to waste such as gutter flooding and sprinklers/irrigation whose spray pattern unnecessarily and significantly hits paved areas

Exemptions from Water Use Restrictions

- **Lawn Watering Ban Exemption** - Newly installed lawns may be exempted from a ban if the procedures listed below are followed. Those wishing to use this exemption would need to contact the District office in advance of the exemption being granted, providing their name, address, phone number, size of lawn and type of watering system. This information would allow the District to quantify the amount of water used under this exemption and to spot check for compliance. The procedures relating to the exemption and the requirements of the exemption would be clearly outlined at the time of the ban. The following procedures are subject to change:
    - Each applicant would be mailed a packet stating the requirements.
    - Once the requirements are met, an authorization packet would be mailed to the customer including a sign to be posted indicating that the District's requirements are being complied with.
    - New lawns must be properly installed, meaning that two inches of organic soil amendment, such as composted yard waste or biosolids, is cultivated into the top six inches of existing soil, at a minimum.
    - New lawns must be watered according to guidelines to be provided in the packet mentioned above.
    - For purposes of this exemption, "new lawn" refers to a lawn newly installed during the current year only. Over seeded or otherwise renovated lawns would not be exempt.

- In the event that the shortage continues to worsen and the Emergency Curtailment Stage is invoked, this exemption would be revoked. It would also be revoked on a case-by-case basis if the rules stated above are not followed, or in the case of a water system emergency. Monitoring and enforcement are at the discretion of the District. The existence of an exemption to a watering ban would be announced early in the response process, for example when the Advisory Stage is invoked.

- **Automatic Irrigation System Exemption** - Users of automatic irrigation systems may be exempt from certain mandatory watering restrictions if proper procedures are followed - but not from a total watering ban. This approach allows an alternate path to achieving savings due to the precision with which such systems can be operated, but is not intended to be a loophole to avoid the need to curtail use. For example, if only 30 minutes of lawn watering is allowed per week, automatic irrigation systems which meet the criteria would be allowed to water based on a certain percentage of evapotranspiration (ET), such as 50%, instead of the time-limit based restriction. [Note: ET is a factor calculated according to climatic data, which is commonly used for lawn watering in commercial applications; ET data would be made available on the District's web page and in alternate formats.] In the event of a total watering ban, these users

would also be prohibited from watering (unless other safety-based criteria are met, as stipulated in the Water Conservation Implementation Plan).

- The procedures to be met include:
  - The area must be audited by an Irrigation Auditor as certified by the Irrigation Association (list from the IA to be available on request).
  - Irrigation efficiency of the system must be at least 62.5%, as defined by the Irrigation Association (includes both system distribution uniformity and management practices).
  - A baseline irrigation schedule based on historical ET must be provided to the system's owner/operator.
  - The owner/operator must evaluate actual ET on at least a weekly basis and change the irrigation schedule if warranted by the ET index.
  - The owner/operator must contact the utility to provide the name of the auditor, date of inspection and the efficiency rating, as well as the name, address and phone number of the contact person for the site being watered, prior to using the exemption
  - Time of day restrictions, such as watering prohibited between 6:00 am and 8:00 pm, would have to be met.
  - The system must have a functioning rain-shutoff device.
  - Watering limitations stipulated by the District would need to be followed. The limitations would be stated as a percent of ET, so that, for example, users who meet the above requirements would be able to water based on 50% of ET (the specific percent amount would be decided upon at the time the restriction is announced, depending on the supply outlook). The District's website (www.yvwd.dst.ca.us/conserve.htm) would be regularly updated to provide the information needed for those watering according to this exemption; the information would be available through other means as well.

- **Other Exemptions** - For purposes of dust control, water may be applied to construction areas or other areas needing to comply with air quality requirements. If recycled water is available, consider requiring or promoting that it be used for dust control, if feasible.

- Ball fields and play fields may be watered at the minimum rate necessary for dust control and safety purposes.
- The District will exempt customers with special medical needs such as home dialysis from any emergency surcharge provided individual customers notify the District of such a need

<u>Water Supply Actions</u>

- If not already implemented, activate interties and any other alternative sources of supply.

EMERGENCY CURTAILMENT STAGE

At this stage, the District recognizes that a critical water situation exists. Without additional significant curtailment actions, a shortage of water for public health and safety will be imminent. No prior emergency in the Yucaipa Valley Water District's history fits this description.

This stage is characterized by two basic approaches. First, increasingly stringent water use restrictions are established and enforced. Secondly, significant rate surcharges are used to encourage customer compliance. While a rate surcharge may be implemented in either the Voluntary or Mandatory stages, a surcharge is a key component to the success of this stage and previous surcharge may be increased if appropriate.

Emergency Curtailment Action Plan

- Continue all previous, applicable actions.
- Define the problem to the public as an emergency and institute formal procedures to declare an emergency.
- Inform customers of the rate surcharge and how it will affect them. Provide information on an appeal process.
- Coordinate with police and fire departments requesting their assistance in enforcing prohibition of water waste.
- Inform customers that taste and odor water quality problems may occur with system-wide reduced water consumption.
- Inform customers about possible pressure reductions and problems this may entail.
- Define and communicate exemptions for medical facilities and other public health situations.

YVWD Internal Operations for Emergency Curtailment Stage

- Continue and enhance "Water Watcher" patrols.
- Continue actions listed in prior stages.
- Curtail fire flow and pipeline testing unless it can be shown to be essential to protect the immediate public health and safety.
- Further enhance water quality monitoring actions

Supply and Demand Management Actions

- Rate surcharges would be implemented to encourage customer compliance with the restrictions, as follows:

    - **Commercial Customers** - Commercial, multifamily and industrial users would be asked to reduce water use by a set percentage of their consumption during the same period in the previous year. Emergency rate surcharges would be established to provide an additional incentive to reduce water use. It is the District's intention to establish a multi-tiered structure. This "variable block approach" would allow for different surcharge rates based on the individual customer's consumption during the same period in the previous year. For example, if the District were to target desired reduction of 85% from the previous year's consumption in that period, any consumption between 0 and 85% would be billed at one rate and any consumption over 85% would be billed at another, much higher rate. In this way, the targeted reduction amount and resulting surcharges would be customized around each customer's water use patterns, while still resulting in a steep surcharge for consumption in excess of the target amount for each block.

        - A billing system modification would be needed to allow the District to accomplish this. If this has not been done by the time it may be needed, a simple across-the-board rate surcharge would be applied.

- **Residential Customers** - A multi-tiered, increasingly steep rate structure would be implemented for residential customers (includes single-family dwellings and duplexes). While there are differences in household size, there is more similarity in residential domestic water use than there is in commercial water use.

    - All lawn and turf irrigation would be prohibited
    - Make recycled water available for street cleaning, construction projects, landscape irrigation, dust control, etc.
    - Require that all firefighting agencies discontinue the use of water in training exercises until emergency is over.
    - Rescind all construction meter or fire hydrant permits.

5.4.4 Short-Term Emergency Curtailment Plan

Although many of the demand reduction measures employed would be similar to those used during a progressive, weather-related shortage, short-term emergencies are unique because of a lack of preparation time and the urgency of immediate, large-scale demand reductions. Each emergency scenario is different, but most of them require major curtailment actions by customers. Also, unlike a drought, some emergencies would be localized, requiring demand reduction for only a limited geographic area.

Strategies for dealing with emergencies have been developed based on lessons learned from previous water utility events, other utility experiences, and a sorting of measures based on specific criteria.

Throughout water shortage events, consistent conservation messages and information on appropriate demand reduction measures should be delivered to water users through the media and by direct contact. Although exact demand reduction goals may not always be met by water users, the water demands during short-term emergencies must be curtailed enough to be beneficial and avoid more serious water shortages.

There are several criteria by which to decide which demand management measures are appropriate to initially reduce demand during an emergency:

- **Timing:** can the measure(s) or action(s) deliver the necessary savings in the necessary timeframe, i.e., are immediate savings needed or can the system support a gradual reduction in demand;
- **Magnitude of savings:** will the measure produce enough savings to make a meaningful difference i.e., reduce demand to the level the impaired water system can handle;
- **Season:** does the action make any impact at the time of year that the emergency occurs, i.e., banning lawn watering will have little impact in the winter months;
- **Costs:** How severe are the cost implications of the measure to the customer, including local business and industry.

5.4.5 Supply and Demand Management during Emergencies

No single strategy can be created which will meet the needs of the District for all emergency scenarios. The criteria listed above create a framework for decision-making. Emergencies initially require quick and immediate response. Once an assessment is made as to how long it will take to restore the system, the immediate response strategy may change if it appears that the repair process will be lengthy.

The strategy for most emergencies can be narrowed to measures having the most immediate impact on water supply and consumption. All needed and available back up supplies would be activated during an emergency, including the use of interties and standby water production wells.

Section 6

Demand Management Measures

6.1 Demand Management Measures

Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) water survey programs for single-family residential and multifamily residential customers; (B) residential plumbing retrofit; (C) system water audits, leak detection, and repair; (D) metering with commodity rates for all new connections and retrofit of existing connections; (E) large landscape conservation programs and incentives; (F) high-efficiency washing machine rebate programs; (G) public information programs; (H) school education programs; (I) conservation programs for commercial, industrial, and institutional accounts; (J) wholesale agency programs; (K) conservation pricing;(L) water conservation coordinator; (M) water waste prohibition; (N) residential ultra-low flush toilet replacement programs (California Water Code Section 10631(f)(1) and (2).

A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan (California Water Code Section 10631(f)(3)).

An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand (California Water Code Section 10631(f)(4)).

An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation (California Water Code Section 10631(g)).

Demand Management Measures are mechanisms implemented by Yucaipa Valley Water District to increase water conservation. A description if each Demand Management Measure is listed below defining the current status of implementation. Yucaipa Valley Water District is a signatory to the California Urban Water Conservation Council's Memorandum of Understanding,

which was developed to expedite implementation of reasonable water conservation measures in urban areas and to establish assumption for use in calculating estimates of reliable future water conservation savings. The Department of Water Resources Demand Management Measures coincides with the 14 Best Management Practices developed by the California Urban Water Conservation Council. The conservation measures are defined below.

Table 6-1 Urban Water Management Plan Demand Management Measures and California Urban Water Conservation Council Best Management Practices

UWMP Demand Management Measures		CUWCC BMP Organization Names (2009 MOU)	
DMM #	DMM Name	BMP #	BMP Name
A	Water survey programs for single-family residential and multifamily residential customers	3.1,3.2	Residential Assistance Programs
B	Residential plumbing retrofit	3.1	Residential Assistance Programs
C	System water audits, leak detection, and repair	1.2	Water Loss Control
D	Metering with commodity rates for all new connections and retrofit of existing connections	1.3	Metering with commodity rates for all new connections and retrofit of existing connections
E	Large Landscape Conservation Programs	5	Landscape
F	High-efficiency washing machine rebate programs	3.3	High-efficiency clothes washing machine financial incentive programs
G	Public Information Programs	2.1	Public Information Programs
H	School Education Programs	2.2	School Education Programs
I	Conservation programs for commercial, industrial and institutional accounts	4	Commercial, Industrial, and Institutional
J	Wholesale agency programs	1.1.3	Wholesale Agency Assistance Programs
K	Conservation Pricing	1.4	Retail Conservation Pricing
L	Water Conservation Coordinator	1.1.1	Conservation Coordinator
M	Water waste prohibition	1.1.2	Water Waste Prevention
N	Residential ultra-low flush toilet replacement programs	3.4	Water Sense Specification (WSS) Toilets

6.1.1 Landscape Water Survey – Scheduled for Implementation

The Yucaipa Valley Water District became a signatory to the California Urban Water Conservation Council's (CUWCC) MOU in 2007 requiring 15% of single family and 15% of multi-family accounts receive surveys within 10 years of the implementation year. YVWD has approximately 11,044 single-family residential dwelling units and 518 multi-family units. To comply with the within the (CUWCC) coverage requirements, the District must offer surveys to 2209 (20%) per year with the goal of completing 15% (1656) in 10 years. This is equivalent to 165 surveys per year. The single-family survey is expected to cost $150 with the multi-family survey totaling $50. Therefore a budget of $24,750 per year is required (Yucaipa Valley Water District, Feasibility Study, 2003).

- Implementation Schedule

  YVWD will implement a landscape water survey program for residential customers by 2015. This concept may be completed with agency collaboration with the City of Yucaipa and Inland Empire Resource Conservation District. In addition, water retailers within the San Bernardino Valley Municipal Water Districts service area are collaborating to determine the most cost effective way to partner on the Demand Management Measures.

- Evaluation of Effectiveness

  The evaluation of effectiveness will be determined by the number of single-family and multi-family account landscape water surveys completed during the reporting period.

6.1.2 Residential Assistance Program – Scheduled for Implementation

YVWD does not have a formal leak detection assistance program. However, YVWD actively responds to customer leaks throughout the year and at that time, discussions regarding water usage on the landscape often occur. Coverage requirements for the residential assistance program would be provided simultaneously with the coverage requirements of the landscape water survey referenced in 6.1.1 above.

- Implementation Schedule
  YVWD will implement a Residential Assistance Program for single-family households by 2015. YVWD does not currently have a formal water survey program. In 2010, YVWD public works department did conduct 88 service calls to repair leaks throughout the District service area. This provides an opportunity to discuss water efficiency measures and provide a water survey program to the customer.

- Evaluation of Effectiveness
  The evaluation of effectiveness will be determined by monthly water usage reductions with each residential assistance program conducted. In addition customers receive both current and previous year water usage, graphed by month, on their monthly bills for comparison of usage.

6.1.3 WaterSense Specifications for New Residential Development - Implemented

In April 2010, YVWD purchased 500 faucet aerators that qualified under the WaterSense Specifications (WSS) in order to meet one component of the water-survey program.

- Implementation Schedule – Faucet Aerators
  The faucet aerators were purchased to coincide with several community events that provided a substantial audience to distribute and educate about the importance of water efficient devices inside and outside the home. Distribution of the faucet aerators took place during the following events.
  1. Iris Festival – May 14th 15th and 16th 2010
     The Iris Festival is a three-day community event located in the City of Yucaipa. Vendors are comprised of public and private agencies, which host approximately 20,000 attendees.
  2. Calimesa 20th Anniversary – November 6th 2010
     The Calimesa 20th Anniversary event consisted of booths and activities for residents in Yucaipa and Calimesa. The venue provided an opportunity for YVWD to discuss indoor and outdoor water-saving techniques.

Table 6-2 Faucet Aerator Quantification

Water Efficiency Product	Quantity	Cost per Device	Estimated Water Savings Per Household
WaterSense Specification Faucet Aerator	500	0.91	1.2 gallon savings pp x 4 pph.
Total		**$495.00**	**1,753 gallons per year**

*DeOreo, et. al. 2001

It's often difficult to gage the effectiveness of water efficient devices since installation tracking is not cost effective for a water retailer. Effectiveness relies on not only the device installation but the education component that is conducted during the giveaway.

- Implementation Schedule – Low-flow Showerheads
  In 1991, it is estimated there were 6,634 single-family residences and 2,299 multi-family units within YVWD boundaries. In 2008, the numbers increased to 10,964 single-family residential units and 503 multi-family units. Yucaipa experienced significant growth of single-family residential units from 1995 – 2008 resulting in the "current housing" interpretation to be a greater saturation than 53% as referenced in the 2003 YVWD Urban Water Conservation Feasibility Study and Implementation Plan.

- Evaluation of Effectiveness
  Proper distribution and installation of low-flow showerheads has an effect on the 75% saturation goal. Customers who presently have a low-flow showerhead may have a tendency to acquire an additional device, keeping the saturation level at a zero net gain. In addition, customers who take advantage of the free low-flow showerhead may not install the device as expected. This program coupled with the residential assistance program becomes imperative to ensure the customer installs the low-flow device within the home.

6.1.4 Leak Detection and Repair and System Water Audits, - Implemented

Yucaipa Valley Water District has been conducting a system water audit, leak detection and repair program since 2002. The water audits are conducted by an outside consultant who conducts a 10-day leak detection survey on various sections of the water distribution system for the District. A total of 75.45 miles were surveyed in 2010.

- Implementation Schedule

YVWD's leak detection program occurs every year in approximately March of each year. The water audits locations rotate each year in order to have a historic tracking of leak detection throughout the district.

- Evaluation of Effectiveness

Thirty-one total leaks were detected in 2010. Most of the reported leaks were due to YVWD public works staff repaired leaks that were detected through the water audit. In addition, there were a total of 8 leak identified on customers properties. Notification letters were sent to these customers in order to notify them to conduct the repairs.

Table 6-3 Yucaipa Valley Water District – Leak Detection Program

Total Leaks	GPM	Average / Per Leak	Calculated Totals
31	47.75	1.54	
Gallons Per Minute			47.75
Gallons Per Day			68,760.00
Gallons Per Year			25,097,400.00
Acre Feet Per Year			77 AFY

System Water Audits

In order to comply with BMP 1.2 – System Water Audits, YVWD recognizes that completing the standard water audit and balance using the American Water Works Association (AWWA) Water Loss software is required. This is to determine the current volume of apparent and real water loss and the cost impact of these losses on utility operations.

YVWD has not implemented the AWWA Water Loss methodology as of December 2010. The schedule for implementation of the AWWA Water Loss Control Program is March 2012 to coincide with the next Water Line Leak Detection Program.

6.1.5 Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections - Implemented

YVWD implements metering and commodity rates for the residential water service with a tiered or inclining block rate structure and five tiers or blocks, with inclining rates based on increased usage. In 2010 there were a total of 12,126 potable and recycled water metered accounts with 100% coverage. However Sewer rates are flat rates for residential service and uniform rates, increasing block rates or long-run marginal cost rates. Commercial and industrial water and sewer service are metered and billed according to consumption quantity.

- Implementation Schedule

The metering with commodity rates for all new connection takes place on the retail water service portion but not on the sewer service portion for residential homes. Metering residential sewer activity will most likely not occur.

- Evaluation of Effectiveness

Customers can review the five-tiered rating structure on their monthly bill. In addition, YVWD adopted a Water Meter Repair, Maintenance and Replacement Program in October 2010. The metering with commodity rates structure provides YVWD the opportunity to recover costs associated with the fluctuations in water service.

6.1.6 Large Landscape Conservation Programs and Incentives - Implemented

Large landscape programs generally include landscapes over three acres such as schools, parks, golf courses and other commercial, industrial and institutional customers. The incentives often consist of Weather Based Irrigation Controllers (WBIC), system retrofits and irrigation training. In 2010, YVWD partnered with San Bernardino Valley Water District on a weather-based irrigation controller program in order to target large landscape water users.

- Implementation Schedule

The WBIC program was implemented in 2010. The San Bernardino Valley Municipal Water District developed a Weather Based Irrigation Controller Program that funds 50% of the cost to install Weather Based Irrigation Controller Systems on publically owned sites. In order for the WBIC program to accurately interpret weather conditions, YVWD installed a Weather Station at the Yucaipa Valley Regional Water Filtration Facility in December 2009. In addition, YVWD also installed irrigation system controllers at nine (9) District owned sites in order to determine the effectiveness of the WBIC's. The nine sites selected would benefit from the program since they used approximately 500 acre-feet of water in FY 2009. The following table demonstrates the commitments made to the Landscape Water Survey

- Evaluation of Effectiveness

Studies have shown that Weather Based (ET) control systems can result in water savings of 25% to 45% per year. The implementation schedule correlates to the evaluation of effectiveness. During the 2010 calendar year it was determined that water consumption at weather based irrigation controller locations did not decrease. This was due to the fact that in most instances human practice consisted of turning off sprinkler systems during the cooler months whereas the WBIC's continued to water minimally during that time. In addition, some of the locations may have been stressed in the summer months prior to the WBIC installation due to lack of watering presumably due to reducing costs.

Table 6-4 Weather Based Irrigation Controller Program Costs

Task	Cost
Weather Based Irrigation Controllers	$5,450.00
Weather Station (1)	$3,725.00
Water Audits	$1,240.00
Total	**$10,415.00**

6.1.7 High-Efficiency Washing Machine Rebate Programs – Scheduled for Implementation

This BMP provides incentives or institutes ordinances requiring the purchase of high-efficiency clothes washing machines (HECWs) that meet an average water factor value of 5.0. If the WaterSense Specification is less than 5.0, then the average water factor value will decrease to that amount.

- Implementation Schedule
  This Demand Management Measure provides a default assumption of water savings equal to 5,100 gallons per year, or .022 AF/. With a service life of 10 years and avoided costs equal to $417/AF, the benefit in undiscounted dollar terms is $92 incentive for high efficiency washers. These results indicate YVWD should provide a $92, possibly $100 incentive for high efficiency washers. This BMP is scheduled for implementation during fiscal year 2011-2012. The budgeted amount has not been determined to report the estimated number of rebates offered.

- Evaluation of Effectiveness
  Under state legislation passed in 2002, the Energy Commission established standards to ensure washing machines sold in California after 2007 use no more than 8.5 gallons of water per cubic foot of washing machine capacity, later decreased to six gallons by 2010. Water efficient washing machines will use on average only 21.1 gallons per wash, or 8,271 gallons a year - compared to typical models that used an average of 39.2 gallons per wash or 15,366 gallons a year for a normal household three years ago. While the consumer on average will pay $130 more for a washing machine, savings during the life of the machine will average $242 in lower energy costs and water bills (Energy Commission, 2002).

6.1.8 Public Information Programs - Implemented

The public information BMP component consists of utilizing public information programs as an effective tool to inform customers about the need for water conservation and ways they can conserve, and to influence customer behavior to conserve.

Yucaipa Valley Regional Water Filtration Facility Tours

YVWD has an active public information program, which provides numerous tours throughout the year at the Yucaipa Valley Regional Water Filtration Facility. In 2010, YVWD conducted 32 tours to various members of the community. Tour dialogue consisted of identifying YVWD's water sources, methods of drinking water treatment along with a water conservation component. Prior to 1997, water supply was 100% groundwater. Due to the increase in growth, the groundwater basins were decreasing rapidly, requiring imported water and recycled water. The facility tours provide an opportunity to transfer this information to the community to discuss the importance of water conservation throughout the community.

Website Outreach

In 2010 YVWD restructured the website to include more comprehensive information about YVWD. The new website has a specific drop down Conservation tab in order to direct customers directly to the water conservation component of the site. Additional information includes; the Drought Contingency Plan, Landscape Showcase which includes information and photographs about drought tolerant landscaping tips and techniques and water saving tips for customers. The YVWD website can be found at www.yvwd.dst.ca.us

Community Event Participation

YVWD is actively involved in various community events to communicate the current projects and goals undertaken by the District.

Monthly Bill Notifications

YVWD has the capability to include significant information about relevant water awareness news. For example, in 2010 YVWD included several conservation tip notifications on the customer bills. For example, the August 2008 bill included a tip to keep showers under 5 minutes to save 1000 gallons of water per month.

Media Outreach

Media outreach is a necessary element in YVWD's Public Information Program. The local media is present at every YVWD Board Meeting in order to communicate the current activity taking place within the District. In addition, YVWD utilizes a public affairs professional to develop articles that inform the community on important current affairs relevant to YVWD.

Drought Tolerant Landscaping

YVWD participated with San Bernardino Valley Municipal Water District's Inland Empire Garden Friendly campaign. The Inland Empire Garden Friendly program was developed by the four major water suppliers of western Riverside and San Bernardino counties in California with cooperation from a university institute, conservation district and local botanic garden. The purpose of the program is to develop a strategy to strengthen consumer demand for climate-appropriate landscaping. The project began in December 2010 so results and effectiveness of the program are to be determined.

- Evaluation of Effectiveness

YVWD's Public Information program is extremely successful and beneficial for the customers. The multi-faceted outreach programs target a diversified audience in order to ensure wide-ranging coverage of water conservation messaging.

6.1.9 School Education Programs - Implemented

Yucaipa Valley Water District partners with Inland Empire Resource Conservation District (IERCD) on water conservation programs within the schools. YVWD and IERCD collectively developed a program for the K-12 student, which also meets the California State Standards

criteria for science. IERCD staff visits the school site and conducts the water conservation program. Topics are grade specific to the State Standards but all students are taught the universal element of Yucaipa and Calimesa's water sources and the importance of water conservation. In 2010, IERCD conducted 21 water conservation programs on behalf of YVWD.

- Evaluation of Effectiveness

IERCD distributes teacher surveys at the conclusion of each program. In most instances the surveys aren't returned for review but the occasional completed forms offer an opportunity to gage program success. In addition, students who received the program in previous years retain the information and actively engage in the water conservation program the subsequent year.

6.1.10 Conservation Programs for Commercial, Industrial, and Institutional Accounts – Scheduled for Implementation

Commercial, industrial and institutional (CII) water demands make up a large percentage of total demand for California (CUWCC, MOU June 2010). YVWD has identified and ranked by use commercial, industrial and institutional customers, YVWD does not have a large manufacturing population. Current commercial, industrial and institutional accounts in the base year 2008 total 288. This portion of the population consumed 206.88 million gallons or 635 acre feet within the 2008 calendar year.

- Implementation Schedule

YVWD is not currently meeting the Conservation Programs for CII accounts at this time. It was determined in the 2005 UWMP that the best way to meet the Demand Management Measure was through ultra low flush toilets (ULFT). An implementation schedule and cost is represented in the table below.

Table 6-5 Commercial, Industrial, and Institutional Ultra Low Flush Toilet Rebate Program

Program Intervention	FY 2012-13	FY 2013-14	FY 2014-15
CII Ultra Low Flush Toilets	$7,750	$15,300	$23,150

(2005 Urban Water Management Plan, numbers changed to reflect present value cost estimates.)

- Evaluation of Effectiveness

The Conservation Programs for CII Accounts effectiveness will be evaluated by the number of CII ULFT's installed. The CII accounts can be cross referenced with past consumption data to determine if water use decreased.

6.1.11 Wholesale Agency Programs

Not Applicable

6.1.12 Conservation Pricing - Implemented

The Retail Water Service Rate BMP was developed to establish a strong nexus between volume-related system costs and volumetric commodity rates, allowing conservation pricing to reward water efficient customers.

YVWD practices conservation pricing for its water service with a commodity rate structure that includes five tiers.

- Implementation

YVWD is currently implementing conservation pricing. With the incentive to conserve structured in the water rate, it is deemed unnecessary to attempt to construct a commodity rate structure for sewer service. Additionally the accuracy of such rate structures, which rely on a formula based on water consumption, are questionable as they generally assess charges based upon winter season demands, which vary demanding on hydrology of a given year and landscaping demands YVWD UWMP, 2005).

- Evaluation of Effectiveness

The effectiveness of this program can be evaluated by longitudinal studies reviewing billing consumption records and pricing structure for a sampling of housing units over time. (YVWD UWMP, 2005)

Table 6-6 Conservation Pricing

Potable Water Commodity Charge - Step Rate Table-per 1000 gallon units	
Units	Cost/Unit
1-15	$1.429
16-60	$1.919
61-100	$2.099
101 & over	$2.429
30+ multiple units X 0.800 factor	
Non-Potable Water - Commodity Charge	
1000 gallons	$1.235

6.12 Water Conservation Coordinator - Implemented

In March 2010 YVWD hired a full-time Resources Sustainability Manager to carry-out the water conservation programs required by the Department of Water Resources and the California Urban Water Conservation Council.

Jennifer Ares
Resource Sustainability Manager
12770 Second Street
Yucaipa, CA 92399
(909) 790-3301 / jares@yvwd.dst.ca.us

6.13 Water Waste Prohibition - Implemented

This program consists of implementing methods that prohibit gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non recycling decorative water fountains.

- Implementation

YVWD has a Water Waste Prohibition Ordinance, which is included within Ordinance No. 48-1998, section 5.15. The ordinance was passed in 1998 and should be updated to correlate with current industry trends and standards. YVWD will adopt a new water waste ordinance within the Calendar Year 2011.

6.1.15 Residential Ultra-Low Flush Toilet Replacement Programs – Not Implemented, will be considered in FY 2012-2013

YVWD does not have a current Toilet rebate program. As mentioned with the other water conservation device replacement programs, a key element necessary to consider targeting conservation programs the device market saturation. YVWD has experienced a considerable amount of new development since 1992. New building codes have propelled water conservation devices increasing the saturation within the community.

In addition beginning January 1st, 2014, 100% of all toilets and urinals sold or installed within the state must be high-efficiency fixtures meeting requirements of the two key plumbing standards, ASME A112.19.2 and ASME A112.19.14. The effective flush volume cannot exceed 1.28 gallons.

- Implementation Schedule

As a result of the impending plumbing standards, YVWD will maximize this water savings Demand Management Measure by possibly implementing toilet rebates in July 2014. This will provide YVWD the opportunity to plan and budget for the rebate program.

- Evaluation of Effectiveness

The evaluation of the effectiveness of the toilet rebate program will be determined through a customer water usage comparison after the toilet installation.

Section 7

Climate Change

Water agencies invest a considerable amount of time determining the most effective way to manage water resources. One frequent challenge consists of forecasting environmental factors that have a direct effect on the availability of water resources. Many of these environmental factors can be expected but determining the magnitude and the timing is complex.

Environmental factors such as climate change have become a leading environmental concern water agencies have included in their water reliability planning. Climate change is defined as the earth's atmosphere trapping solar energy, which collects greenhouse gases (GHGs). Exacerbated by human practices, GHG's consists of water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2o), ozone (O3), and chlorofluorocarbons (CFC's) that form a type of barrier, which reflects the light and infrared radiation back to the earth. Table 7-1 below represents the various greenhouse gases and their 100-year global warming potential along with their expected atmospheric lifetime. The table is a representation that these GHG will continue to rise before they have time to dissipate from the atmosphere.

Table 7-1 – Global Warming Potential and Atmospheric Lifetimes of Basin Greenhouse Gases

Greenhouse Gases	100-year Global Warming Potential (1)	Atmospheric Lifetime (yrs)
Carbon Dioxide – CO2	1	Variable
Methane – CH4	21	12(±3)
Nitrous Oxide – N2O	310	120
Sulfur Hexaflouride – SF6	23,900	3,200

(1) The warming effects over a 100-year time frame relative to other GHG (USEPA, 2009)

These statistical estimates necessitate the need for climate change analysis in order to attempt to reduce negative impacts to the environment, in this particular case, water reliability and sustainability. The Lead Climate Change and Water Intergovernmental Panel and the Environmental Protection Agency conduct analyses of the greenhouse gases listed above. The Panel states; high priority water resources challenges that are affected by climate can be categorized into four interrelated areas:

- Assuring an adequate water supply;
- Protecting human life, health, and property;
- Protecting the quality of freshwater resource and the ecosystem they support; and
- Protecting coastal and ocean resources and the ecosystems they support.

Furthermore the Panel states, to assure an adequate water supply now and into the future, water managers and decision makers need the capacity to predict and anticipate:

- How aquatic ecosystems respond to the short- and long-term changes in freshwater quantity, quality and availability;
- Historical patterns and projected trends in annual and seasonal variability in streamflows, groundwater levels, and snowpack characteristics to improve water use planning and provisioning;

- How future climate, water management decisions, and land-use scenarios will impact water uptake for agricultural, energy, water and wastewater treatment requirements, health risks, and aquatic ecosystem biodiversity;
- How water quality will change in response to the types and quantities of chemical and microbial contaminants, warmer and more variable water temperatures, different flow patterns, and alternative water resource management practices; and
- Impacts of climate, land-use, and water management practices in conjunction with streamflows, precipitation patterns, and groundwater recharge on saltwater intrusion into freshwater aquifers and estuaries and salinity in water supplies.

In order to predict and anticipate the scenarios mentioned above observation data, agencies that provide the data, the systems that produce the data, and the models that enable projection of future climate conditions are critical for decision making. There has been an extensive amount of information developed regarding climate change however merging the data to act as a functional tool is necessary for water agencies to successfully utilize and make predictions. During the planning timeframe of the 2010 Urban Water Management Plan, the Subcommittee on Water Availability and Quality (SWAQ) will work to improve data integration among the various agencies.

7.1 Climate Change in California

In 2006 the first California Climate Action Team (CCAT) Report to the Governor contained recommendations to the strategies to help meet the targets of Executive Order S-3-05 listed below.

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 Percent below 1990 levels.

Following the Executive Order which defines these periodic milestones several legislative actions were taken.

7.1.1 Assembly Bill 32 (AB 32) – The California Global Warming Solutions Act of 2006

In 2006, the Legislature passed and Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act of 2006, which set the 2020 greenhouse gas emissions reduction goal into law. It directed the California Air Resources Board (ARB or Board) to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 limit. The reduction measures to meet the 2020 target are to be adopted by the start of 2011 (http://www.arb.ca.gov/cc/ab32/ab32.htm.)

- Develop a scoping plan outlining actions to reduce greenhouse gases in California. The approved scoping plan indicates how these emission reductions will be achieved from significant greenhouse gas sources via regulations, market mechanisms and other actions.

- In December 2007, the Board approved the 2020 emission limit of 427 million metric tons of carbon dioxide equivalent (MMTCO2E) of greenhouse gases.

- Adopt a regulation requiring the mandatory reporting of greenhouse gas emissions (HSC §38530). The reporting regulation serves as a solid foundation to determine greenhouse gas emissions and track future changes in emission levels.

- Identify and adopt regulations for discrete early actions that could be enforceable on or before January 1, 2010 (HSC §38560.5). The Board identified nine discrete early action measures including regulations affecting landfills, motor vehicle fuels, refrigerants in cars, tire pressure, port operations and other sources in 2007 that included ship electrification at ports and reduction of high GWP gases in consumer products. Regulatory development for the remaining measures is ongoing.

- Ensure early voluntary reductions receive appropriate credit in the implementation of AB 32 (HSC §38562(b)(3)). In February 2008, the Board approved a policy statement encouraging voluntary early actions and establishing a procedure for project proponents to submit quantification methods to be evaluated by ARB.

- Convene an Environmental Justice Advisory Committee (EJAC) to advise the Board in developing the Scoping Plan and any other pertinent matter in implementing AB 32 (HSC §38591).

- Appoint an Economic and Technology Advancement Advisory Committee (ETAAC) to provide recommendations for technologies, research and greenhouse gas emission reduction measures (HSC §38591).

7.1.2 Senate Bill 97

Senate Bill 97 requires the Office of Planning and Research (OPR) to, by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption.

On April 13, 2009, OPR submitted the proposed amendments to the Secretary for Natural Resources. The Natural Resources Agency conducted formal rulemaking in 2009, certified the amendments in December 2009, and adopted and codified into law the amendments in March 2010. The amendments become effective in June 2010 and provide regulatory guidance with respect to the analysis and mitigation of the potential effects of GHG emissions.

7.1.3 Executive Order S-13-08

The Sea Level Rise Planning Directive's specific actions include; define where California is most vulnerable to climate change, a National Academy of Sciences study on sea level rise, guidance to state agencies regarding sea level rise near coastal and floodplain areas, and initiate studies on critical infrastructure projects and land-use policies vulnerable to sea level rise.

7.1.4 California Code of Regulations (CCR) Title 24, Part 6

Specific energy efficient building codes were established in 1978 unintentionally decreasing GHG emissions. In 2008, the building standards were changed to reflect reasonably priced energy supply, AB 32 compliance, continually upgrade of the Building Energy Efficiency

Standards, energy efficient state building codes and improve energy efficiency of nonresidential buildings.

7.2 Potential Climate Change Impacts to Yucaipa Valley Water District

The Yucaipa Valley Water District is located in a high elevation valley at the base of the San Bernardino Mountain Range. The District's primary service area ranges in elevation from a low elevation of 2,044 feet above sea level to a high elevation of 5,184 feet above sea level. The range in elevation of 3,140 feet within the District's service area requires the District to provide water service from 18 separate pressure zones. The service area, which is comprised of the cities of Yucaipa and Calimesa, is located in the Santa Ana Watershed, approximately 40 miles west of Palm Springs, 70 miles east of Los Angeles, and 120 miles north of San Diego. This region is often referred to the Inland Empire.

Santa Ana Watershed Water Supply Effects Due to Global Warming

- Increased temperatures
- Variable precipitation levels
- Reduced snowpack, reducing deliveries to Southern California

7.2.1 Warmer Temperatures

The initial product of climate change is the increase in air temperatures due to the GHG buildup in the atmosphere. The Inland Empire's temperatures average 15° warmer than the coastal regions due to the natural border of the San Bernardino Mountains. The RAND Corporation is a nonprofit institution that improves policy and decision-making through research and analysis. The RAND Corporation conducted a temperature forecast for Southern California, including the Santa Ana Watershed region. The projection anticipates warmer temperatures, which will intensify heat island effects from the watershed's existing urban development (SAWPA, IWMP, 2009). Higher temperatures will increase levels of evaporation and transpiration, which in turn increase water demand for the region.

7.2.2 Snowpack and Streamflows

Currently, YVWD's water supply source is comprised of 50% State Water Project water and the additional 50% local sources consisting of groundwater basins and surface flows. Snowpack alterations have a direct effect on YVWD water supplies. The source of SWP water originates in the Feather River watershed, located in Northern California. The Feather River watershed originates in the Sierra Nevada Mountains. While 2009 and 2010 experienced above average snowpack, the average early snowpack in the Sierra Nevada has decreased by about 10 percent during the last century, representing a loss of 1.5 million acre feet of snowpack storage (SAWPA, IWMP, 2009). Rainfall has become extremely variable as dry and wet years are recorded in the past ten years.

This activity of outflows and exports in the Delta are often of interest for water management in California. Figures 7-1 and 7-2 show monthly average results from the three statewide model runs. Delta exports do not change much (with possible exceptions for June and July) with water demand changes from 2020–2050. Dry-warm climate warming, however, increases Delta exports in winter months (when runoff would be more plentiful), decreases significantly during the present spring snowmelt season, and decreases a little during the summer. Surplus Delta outflows (Figure 7-2) do not change much with population change alone from 2020 to 2050, but decrease greatly with dry-warm climate change.

Figure 7-1 Monthly average delta exports, statewide optimizations (TAF/month)

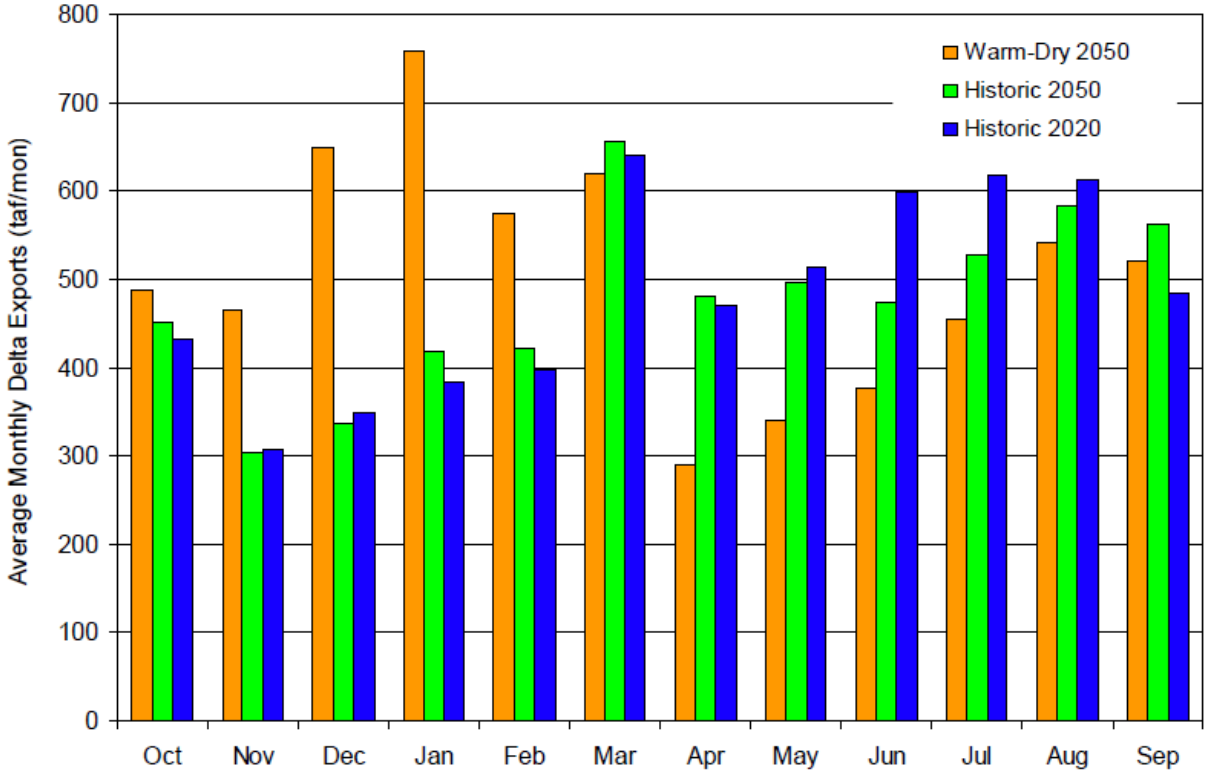
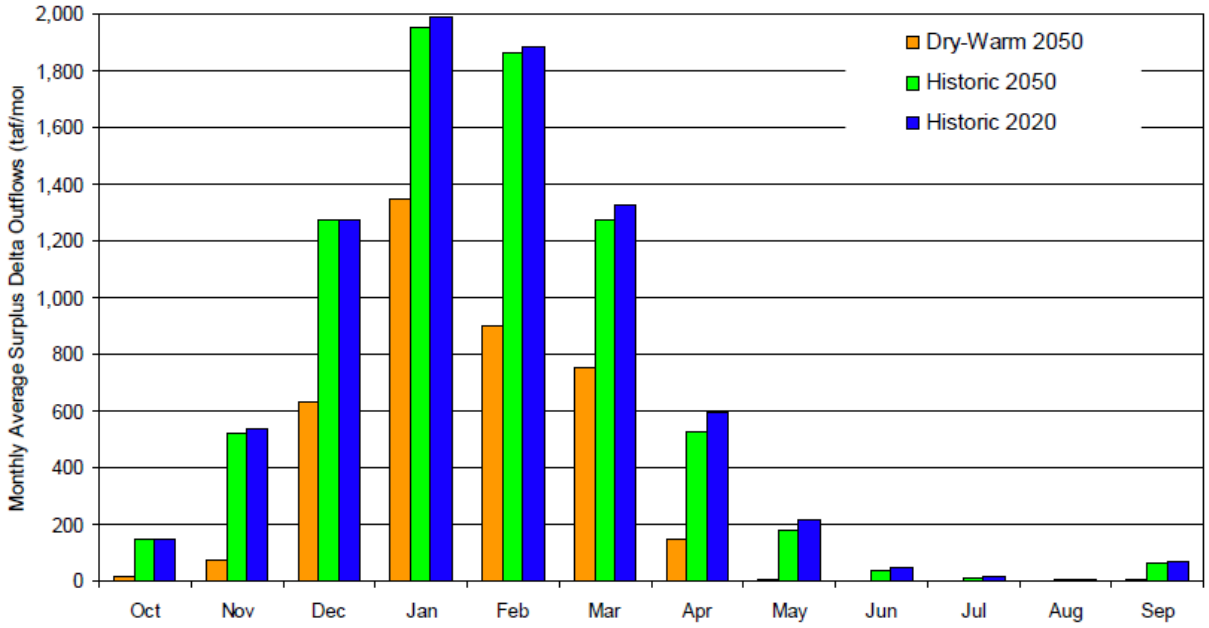


Figure 7-2. Monthly average surplus delta outflows, statewide optimizations (TAF/month)



7.2.3 Elevated Flood Risk

The Santa Ana Watershed will most likely experience peak water flows due to accelerated snowpack melting. This scenario would most likely limit the amount of surface water captured. High intensity storms would prevent groundwater replenishment from occurring in the Yucaipa, San Timoteo and Beaumont Basins. The topographical makeup of the Yucaipa Valley consists of an elevation change of 3140 feet, characteristically causing water flows to increase as they retreat from the foothills. Climate change may have a tendency to increase storm intensity, decreasing the chance of stormwater capture into our local basins.

7.2.4 Increased Wildfire Risk

Current climate models for forests and rangelands predict that California will soon be experiencing many changes as a result of climate change. These include increased wildfire frequency and intensity; longer fire seasons; declines in distribution, productivity and health of conifers and some range species; changes in ecosystems, wildlife habitat and populations; potential increases in drought, insects and disease in Southern California; and increased spread of invasive species.

Healthy forests have an important role to play in addressing climate change. Trees remove carbon dioxide, the primary greenhouse gas of concern, from the air and store it as carbon in as they grow. When trees die, they release CO2 back into the atmosphere. Forest damage and loss to wildfires, insects and disease, or development can result in large CO2 emissions. (http://www.fire.ca.gov/resource_mgt/resource_mgt_eprp_climate/climate_change.php)

Yucaipa Valley Water District is located in the foothills of Yucaipa which is bordered by mountains, open fields and undeveloped lots contiguous to residential development. Residential landscaping, fencing and outbuildings increase fuel loading, spotting and fire intensity.

Calfire has developed a Fire Hazard Model, which considers the wildland fuels. The model also considers topography, especially the steepness of the slopes. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. The model defines fire hazard areas as moderate, high and very high. The YVWD is classified in the 'Very High' Zone due to the close proximity to the bordering mountains.

The American Water Works Association (AWWA) emphasizes that whether or not fire is an ecological benefit to the unique ecology in the region, fire has a serious impact on water supply in terms of both reduced water quality and possible storage capacity due to sedimentation. Increased wildfires due to climate change would increase the need to retain water quality and ensure erosion control measures are proactively put in place to prevent sedimentation accumulation.

7.3 Climate Change Management Strategies

Water managers will embark on new strategies and modeling to determine how to account for future climatic alteration. YVWD's current approach to increase local water reliability with more sustainable practices will reduce the climate change impact for the region.

- Recycled Water System Expansion – Recycled water becomes a drought proof method of water supply. YVWD has developed a recycled water program and is currently expanding to provide an increase supply of recycled water or the community. In 2006, the California Energy Commission released a report, Refining Estimates of Water Related Energy Use in California, in which they concluded that water supply/conveyance is the most energy intensive source of water, with imported water supplies in southern California requiring almost five times the energy than water supplied to northern California.
- Alternative energy sources are also being explored by YVWD in order to establish a more efficient facility while reducing greenhouse gases.
- Maximizing groundwater recharge is an additional approach YVWD is utilizing in order to increase local supplies.

The next National Climate Assessment is due in 2013, this document will provide an opportunity for enhanced water related data collection in partnership with regions and sectors as well as improved mechanisms for data interoperability

During the 2010 Urban Water Management Planning timeframe, advances in climate change data collection and interpretation will be developed in order to attempt to predict upcoming climate change impacts on water supply reliability and sustainability.