

Appendix K:

Water Supply Assessment Reports

This page intentionally left blank.



THE CITY OF SAN DIEGO

MEMORANDUM

DATE: October 2, 2014

TO: Cathy Winterrowd, Deputy Director, Planning Department

FROM: Seevani Bista, Senior Water Resources Specialist, Public Utilities Department

SUBJECT: Water Supply Assessment (WSA) Report – Southeastern San Diego Community Plan Update (Internal Order No. FF1000347-12)

In response to your request, please find attached WSA for Southeastern San Diego Community Plan Update approved by Deputy Director of the Long-Range Planning and Water Resources Division, Public Utilities.

The Public Utilities Department (Department) prepared this WSA to assess whether sufficient water supplies are or will be available to meet the projected water demands of the project. The findings verify that there is sufficient water supply to serve existing demands, projected demands of the project, and future water demands within the Water Department's service area in normal and dry year forecasts during a 20-year projection.

Should there be any comments on the WSA at the conclusion of the public review process of the EIR, please forward them for our review and comments for our review. Please provide us a copy of the EIR after the City Council approval.

If you have any questions, please call Seevani Bista at (619) 533-4222.


Seevani Bista

AK/tm

Attachment: Water Supply Assessment Report

cc: Ray Palmucci, Deputy City Attorney, Office of the City Attorney
Marsi A. Steirer, Deputy Director, Public Utilities Department
George Adrian, Principal Water Resources Specialist
Myra Herrmann, Senior Planner
Karen Bucey, Associate Planner
Anas Kaziha, Junior Engineer-Civil, Public Utilities Department
RMS 6.8.4



WATER SUPPLY ASSESSMENT REPORT

Southeastern San Diego Community Plan Update

Prepared by:

City of San Diego Public Utilities Department

Reviewed by:

Marsi A. Steirer

10/1/14

Marsi A. Steirer, Deputy Director

Date

Long-Range Planning & Water Resources Division

Prepared: September 2014

City of San Diego Public Utilities Department Water Supply Assessment Report

Southeastern San Diego Community Plan Update

Table of Contents

Section 1 - Purpose.....	1
Section 2 - Project Description.....	2
Section 3 - Findings.....	4
Section 4 - City of San Diego Public Utilities Department.....	7
4.1 Overview of Potable System Facilities	7
4.2 Overview of Recycled System Facilities	8
Section 5 - Existing and Projected Supplies.....	10
5.1 Metropolitan Water District of Southern California	11
5.2 San Diego County Water Authority	13
5.3 2009 Comprehensive Water Package.....	15
5.4 Public Utilities Department	16
5.4.1 Demonstrating the Availability of Sufficient Supplies	16
5.4.2 Plans for Acquiring Additional Supplies	22
Section 6 - Projected Demands	28
6.1 Water Sales to Other Agencies.....	32
6.2 Projected Single-dry Year Water Supply and Demand.....	35
6.3 Projected Multiple-dry Year Water Supply and Demand	35
Section 7 - Conclusion - Availability of Sufficient Supplies	37
Source Documents.....	39

Section 1 - Purpose

On January 1, 2002, Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) took effect. The intent of SB 610 and SB 221 was to improve the link between information on water supply availability and certain land-use decisions made by cities and counties. Under SB 610 (codified in the Water Code beginning at Section 10910), a water supply assessment (WSA) must be furnished to cities and counties for inclusion in any environmental documentation of projects (defined in the Water Code) that propose to construct 500 or more residential units, or that will use an amount of water equivalent to what would be used by 500 residential units, and are subject to the California Environmental Quality Act (CEQA). Under SB 221, approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply or water supply verification (WSV).

Not every project that is subject to the requirements of SB 610 is also subject to the mandatory water verification of SB 221 (e.g., if subdivision map approval is not required). Conversely, not every project that is subject to the requirements of SB 221 must also obtain a SB 610 water supply assessment.

A foundational document for compliance for both SB 610 and SB 221 is the Urban Water Management Plan (UWMP) of the relevant water agency. Both of these statutes repeatedly identify the UWMP as a planning document that can be used by a water supplier to meet the standards set forth in both statutes. Thorough and complete UWMPs will allow water suppliers to use UWMPs as a foundation to fulfill the specific requirements of the two statutes. Cities, counties, water districts, property owners and developers utilize this document when planning for and proposing new projects. It is crucial that cities, counties and water suppliers work closely when developing and updating these planning documents. The City of San Diego's 2010 UWMP, which is used as the basis for this Report (WSA), was adopted by the San Diego City Council in June 2011.

The City of San Diego (City) Development Services Department (DSD) requested the Public Utilities Department (Department) prepare this WSA as part of the environmental review for the Southeastern San Diego Community Plan Update. A more detailed description of the Project is provided in Section 2 of this WSA. This WSA evaluates water supplies that are or will be available during normal, single-dry year, and multiple-dry water years during a 20-year projection to meet the projected demands of the Project, in addition to existing and planned future water demands of the Department. This WSA provides an assessment of the availability of sufficient water supplies for the Project only, and does not constitute approval of the Project.

This WSA also includes identification of existing water supply entitlements, water rights, water service contracts, or agreements relevant to the identified water supply for the Project and quantities of water received in prior years pursuant to those entitlements, rights, contracts and agreements.

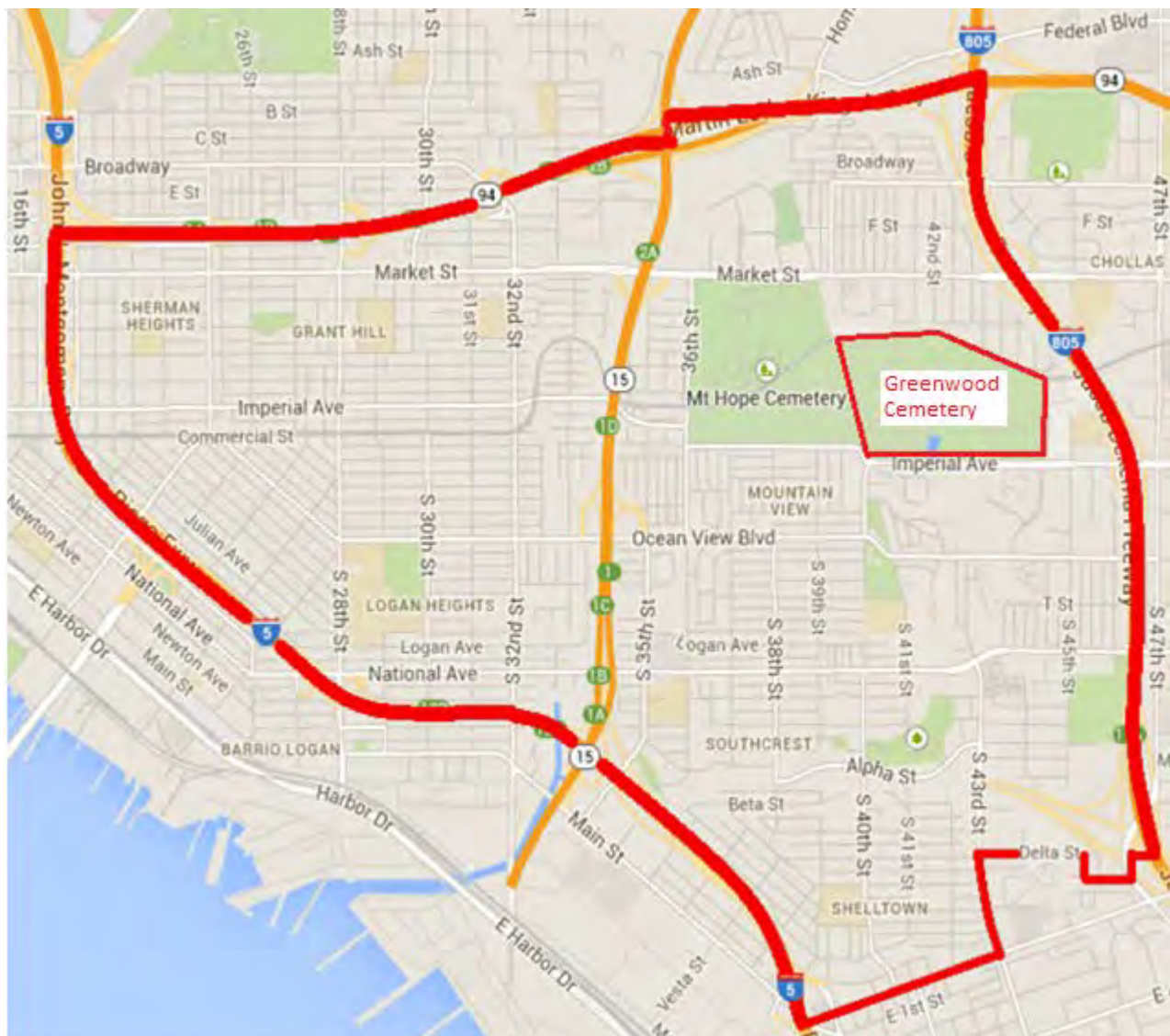
This Report has been prepared in compliance with the requirements under SB 610 by the Department in consultation with DSD, the San Diego County Water Authority (Water Authority) and the Metropolitan Water District of Southern California (MWD).

Section 2 - Project Description

The project proposed is the Southeastern San Diego Community Plan Update. The project is located just east of Downtown San Diego and encompasses approximately 3,051 acres, including 121 acres of unincorporated San Diego County where the Greenwood Cemetery lays. The Southeastern San Diego community lies south of State Route 94 (SR-94), between Interstate 5 and Interstate 805, and north of the city limits of National City. Neighborhoods contained in Southeastern San Diego include Sherman Heights, Grant Hill, Stockton, Mt. Hope, Logan Heights, Mountain View, Southcrest and Shelltown.

The project site map is shown in Figure 2-1.

**FIGURE 2-1
VICINITY MAP OF PROJECT**



The predominant land use designation will remain residential, with Low Medium (678 acres) mirroring the current prevalence of single-family houses intermixed with duplexes and apartments. Land use categories allowing both commercial and residential would comprise about nine (9) percent of the community, spanning much of the Commercial Street/Imperial Avenue, Market Street and National Avenue corridors. Table 2-1 is showing future land usage that is projected until 2035 of the project time frame.

Table 2-1
Future Land Use in the Planning Area by Percent Share

Future Development	
Residential	57%
Mixed use	9%
Park & Open Space	6%
Institutional	18%
Commercial & Industrial	10%

A comparison of the existing development and the new community plan update is tabulated below in Table 2-2.

The project would result in the existing inventory of 15,204 housing units increasing by 3,214 (21 percent) to a total of 18,418. Commercial, office, and industrial development is projected to increase by 36 percent, 30 percent and 20 percent respectively.

TABLE 2-2
PROPOSED AND EXISTING DEVELOPMENT

Southeastern San Diego Community Plan Update			
Development Type	Planned	Existing	Proposed
<i>Residential (Units)</i>			
Single-Family Residential	10,304	11,167	5,765
Multifamily Residential	7,137	4,037	12,653
Total Residential	17,441	15,204	18,418
Employees	12,471		Employees in Table 3-1
<i>Non-Residential (square feet)</i>			
Commercial	Calculated in Employees value above	1,807,500	2,461,200
Office		216,000	280,900
Industrial and Utilities		2,079,700	2,498,500
Community Facilities		2,282,300	2,593,400
Total Non-Residential		6,385,600	7,834,000

1. Single-family residential includes detached single-family and multi-unit single-family. Multi-family residential as part of mixed-use.
2. Non-residential development rounded to nearest 100 square feet

Section 3 - Findings

Water Assessment

Project: This Report identifies that the proposed water demand projections for the Project are included in the regional water resource planning documents of the City, Water Authority and MWD. Current and future water supplies, as well as actions necessary to develop the future water supplies, have been identified. This Report demonstrates that there will be sufficient water supplies available during normal, single-dry year, and multiple-dry water years over a 20-year projection to meet the unanticipated demands of the Project.

As demonstrated in Table 3-1 of this Report, prepared by the Department in compliance with the requirements of SB 610, using the City's and Water Authority's 2010 UWMP based upon San Diego Association of Governments (SANDAG) Series 12 Forecast land use, there is sufficient water planned to supply the Project's estimated annual average usage. The projected water demands of the Project are 5,376,299 gallons per day (gpd) or 6,021 acre feet per year (AFY). In the City's 2010 UWMP, the planned water demands of this project site are 5,709,690 gpd or 6,395 AFY. As a result, the water demand of this community plan will result in no unforeseen demands.

Existing and Future Developments Planned to occur by 2035: The City's 2010 UWMP demonstrates there will be sufficient water supplies available to meet demands for existing and planned future developments that are projected to occur by 2035. Based on a normal water supply year, the estimated water supply projected in five-year increments for a 20-year projection will meet the City's projected water demand of 240,472 acre-feet^A (AF) in 2015 to 298,860 AF in 2035 (**Table 6-5**) for these developments. Similarly, based on a single-dry year forecast (**Table 6-7**), the estimated water supply will meet the projected water demand of 318,586 AF (2035). Based on a multiple-dry year, third year supply (**Table 6-8**), the estimated water supply will meet the projected demands of 281,466 AF (2015); 303,004 AF (2020); 322,166 AF (2025); 334,720 AF (2030); and 346,823 AF (2035).

Therefore, based on the findings from the City's 2010 UWMP this project will result in no unanticipated demands.

^A An acre-foot of water equals 325,851 gallons, which is enough water for two average families of four for one year.

TABLE 3-1
WATER DEMAND ANALYSIS

Planned Water Demands for the Project Site included in the 2010 UWMP				
Category	Quantity		Estimated Potable Water Use in	
			Gallons per Day (GPD)	Acre-Feet per Year (AFY)
2035				
Single-family Units ¹	10,304		3,705,318	4,150
Multi-family Units ²	7,137		1,256,112	1,407
Employees	12,471		748,260	838
Total			5,709,690	6,395
Projected Water Demands for Southeastern San Diego Community Plan Update				
	Quantity		GPD	AFY
Single-family Units ¹	5,765		2,073,094	2,322
Multi-family Units ²	12,653		2,226,928	2,494
Non-Residential	sq. ft	Employee		
Commercial ^{4,3}	2,461,193	4,922	295,343	331
Office ^{5,3}	280,867	1,021	61,280	69
Industrial and Utilities ^{6,3}	2,498,547	4,164	249,855	280
Community Facilities ⁷	2,593,392		469,799	526
Total			5,376,299	6,021
Net Water Demands				
Projected			6,021	AFY
City of San Diego 2010 UWMP - Planned			6,395	AFY
Unanticipated Demand			0	AFY

Table 3-1 Notes:

1. 116 gpcd in the City's acceptable standard for single-family water consumption (Includes landscaping water demand). The person per household (residential) is estimated at 3.1 based on City wide average (SANDAG).
2. 80 gpcd is the City's acceptable standard for multi-family water consumption (includes landscaping water demands). The person per household (residential) is estimated at 2.2 based on City wide average (SANDAG).
3. The utilization of 60 gallons per person per day is the City's acceptable standard for employment water use (Includes nominal landscaping water demand).
4. Number of retail employees estimated at 500 sq ft per employee (City Data)
5. Number of office employees estimated at 275 sq ft per employee (City Data)
6. Number of Industrial employees estimated at 600 sq ft per employee (City Data)
7. Number of Community Facilities (Schools and Parks) estimated at 7,891 Gallons/acre/day (AWWA Research Foundation)

Conclusion

In summary, these findings substantiate that there is sufficient water supply planned to serve this Project's future water demands within the Department service area in normal, single-dry year, and multiple-dry water year forecasts.

Therefore, this Report concludes that the projected level of water use for this Project is within the regional water resource planning documents of the City, the Water Authority and MWD. Current and future water supplies, as well as the actions necessary to develop these supplies, have been identified in the water resources planning documents of the Department, the Water Authority, and MWD to serve the projected demands of the Project, in addition to existing and planned future water demands of the Department.

Section 4 - City of San Diego Public Utilities Department

The City purchased its initial water system in 1901 from the privately owned San Diego Water & Telephone Company. Since then, continual expansion of the water system has been required to meet the demands of the growing population of the City. To meet the demand, the Department purchased a number of reservoirs between 1913 and 1935 to supplement local water supplies. Despite low annual precipitation in the area (approximately 10 inches per year), these reservoirs supplied the City's growing demands until 1940.

The need to import water emerged with the increased demand generated by the presence of the United States Navy prior to and during World War II, and the ensuing population growth. As a result, the Department and other local retail water distributors formed the Water Authority in 1944 for the purpose of purchasing Colorado River water from MWD. The Department and other local retail water distributors began receiving imported water from the Colorado River in 1947.

Today, the Department treats and delivers more than 200,000 AFY of water to more than 1.3 million residents. The water system extends over 404 square miles, including 342 square miles in the City. The Department potable water system serves the City and certain surrounding areas, including both retail and wholesale customers. The Project is located within the Department service area.

In addition to delivering potable water, the City has a recycled water program. Its objectives are to optimize the use of local water supplies, lessen reliance on imported water and free up capacity in the potable system. Recycled water provides the City a dependable, year-round, locally produced and controlled water resource.

4.1 Overview of Potable System Facilities

The water system consists of nine raw water storage facilities with over 408,000 AF of storage capacity, three water treatment plants, 28 treated water storage facilities, and more than 3,212 miles of transmission and distribution lines.

The Department maintains and operates nine local surface raw water storage facilities, which are connected directly or indirectly to the City's water treatment operations. The Lower Otay, Barrett, and Morena Reservoirs (135,349 AF total capacity) service the Otay Water Treatment Plant in south San Diego; the El Capitan, San Vicente, Sutherland, and Lake Murray Reservoirs (236,311 AF total capacity) service the Alvarado Water Treatment Plant in central San Diego; and the Miramar Reservoir (6,682 AF total capacity) services the Miramar Water Treatment Plant in north San Diego. Lake Hodges Reservoir has a total capacity of 30,251 AF and is connected to Olivenhain Reservoir, which is owned by Water Authority. Olivenhain Reservoir is connected to the Water Authority's second aqueduct. Through this connection, Hodges water can be delivered to all City treatment plants. The City has the ability to access 50 percent of the local water available in Hodges Reservoir via the Water Authority's delivery system.

The Department maintains and operates three water treatment plants with a combined total rated capacity of 423,860 AFY (378.4 million gallons per day MGD). The Miramar Water Treatment

Plant (Miramar WTP), originally constructed in 1962, has a rated capacity of 161,300 AFY (144 MGD) with the ability to increase to 240,830 AFY (215 MGD) after the replacement of the two old clearwells in 2016. The Miramar WTP generally serves the City's geographical area north of the San Diego River (north San Diego). The Alvarado Water Treatment Plant (Alvarado WTP), operational since 1951, had an initial capacity rating of 134,417 AFY (120 MGD). Several hydraulic improvements and upgrades were completed in 2011 which increased the capacity of the plant to 224,028 AFY (200 MGD). The California Department of Public Health (CDPH) has approved this rating for the Alvarado WTP. The Alvarado WTP generally serves the geographical area from National City to the San Diego River (central San Diego). The Otay Water Treatment Plant (Otay WTP) was constructed in 1940, and has a current rated capacity of 38,533 AFY (34.4 MGD), which meets current and short-term forecasted demands. The Otay WTP has hydraulic capacity to increase to 44,806 AFY (40 MGD) in the future. In order to do so, approval from CDPH is required, based upon a future high filtration rate study. The Otay WTP generally serves the geographical area bordering Mexico (south San Diego) and parts of the southeastern portion of central San Diego. All upgrade work was completed in 2012 including the construction of a third flocculation and sedimentation basin, filter piping and media improvements.

The Department maintains and operates 28 treated water storage facilities including steel tanks, standpipes, concrete tanks and rectangular concrete reservoirs, with capacities varying from less than one to 35 million gallons.

The water system consists of more than 3,212 miles of pipelines, including transmission lines up to 84 inches in diameter and distribution lines as small as four inches in diameter. Transmission lines are pipelines 16 inches and larger in diameter that convey raw water to the water treatment plants and convey treated water from the water treatment plants to the treated water storage facilities. Distribution lines are pipelines 16 inches and smaller in diameter that directly services the retail users connected to a meter. In addition, the Department maintains and operates 49 water pump stations that deliver treated water from the water treatment plants to approximately 279,557 metered service connections in 128 different pressure zones. The Department also maintains several emergency connections to and from neighboring water agencies, including the Santa Fe Irrigation District (Miramar WTP), the City of Poway (Miramar WTP), Olivenhain Municipal Water District (Miramar WTP), the Cal-American Water Company (Alvarado and Otay WTP), Sweetwater Authority (Otay WTP), and the Otay Water District (Otay WTP).

4.2 Overview of Recycled System Facilities

The City's recycled water system consists primarily of two water reclamation plants with a combined total wastewater treatment capacity of 50,406 AFY (45 MGD), three recycled water storage facilities with over 12 million gallons (12 MG) of storage capacity, and more than 94 miles of transmission and distribution lines.

Located in the Miramar area, the North City Water Reclamation (NCWRP) treats an average of 18,482 AFY (16.5 MGD) of wastewater, although the plant has an ultimate treatment capability of 33,604 AFY (30 MGD). In Fiscal Year (FY) 2014, 8,417 AFY (7.5 MGD) was beneficially reused. The Department maintains and operates the Northern Service Area distribution system

which consists of 91 miles of recycled water pipeline, two reservoirs, two pump stations, with service to 574 meters.

Located at the end of Dairymart Road, near the International Border with Mexico, the South Bay Water Reclamation Plant (SBWRP) treats an average of eight (8) MGD of wastewater, although the Plant has a treatment capability of 16,802 AFY (15 MGD). In FY 2014, an average of 4,804 AFY (4.3 MGD) was beneficially reused. The Department maintains and operates the Southern Service Area distribution system which consists of three miles recycled water pipeline, one storage tank, one pump station and seven meters.

Section 5 - Existing and Projected Supplies

The Department relies on imported water as its major water supply source, and is a Water Authority member agency. The Water Authority is a member agency of MWD. The statutory relationships between the Water Authority, MWD and its member agencies, respectively, establish the scope of the Department's entitlements to water from these two agencies. Due to the Department's reliance on these two agencies, this Report relies and includes information on the existing and projected supplies, supply programs, and related projects of the Water Authority and MWD.

The City relies on the long-term water resources planning documents of the Water Authority and MWD to support the work on this Report. These documents are available at the following websites and contacts:

San Diego County Water Authority

<http://www.sdcwa.org/2010-urban-water-management-plan>

Dana Frieauf, Principal Water Resources Specialist (858) 522-6749

Metropolitan Water District of Southern California

<http://www.mwdh2o.com/mwdh2o/pages/yourwater/ywater01.html#RUWMP>

MWD staff, (213) 217-6000

The Water Authority and MWD are actively pursuing programs and projects to diversify their water supply resources. A description of these efforts as well as the challenges facing the Water Authority and MWD can be found in the San Diego County Water Authority Official Statement, dated February 13, 2013, relating to Water Revenue Refunding Bonds 2013A, and MWD's Official Statement, dated March 13, 2014, relating to Water Revenue Refunding Bonds, 2014 Series A. These Official Statements are available at the following websites:

<http://www.sdcwa.org/sites/default/files/files/finance-investor/2013Bond.pdf>

<http://mwdh2o.com/mwdh2o/pages/finance/PDFs/2014-Ser.A-B-FOS.pdf>

A brief overview of MWD and the Water Authority, including the Department relationship to these agencies, is included below.

A description of local surface and local recycled water supplies available to the Department can be found in Section 5.4 of this Report.

This information is current at the time this document was prepared.

5.1 Metropolitan Water District of Southern California

Metropolitan Water District (MWD) was created in 1928, under the authority of the Metropolitan Water District Act (California Statutes 1927, Chapter 429, as reenacted in 1969 as Chapter 209, as amended) (the “MWD Act”). MWD’s primary purpose is to provide a supplemental supply of wholesale water for domestic and municipal uses to its constituent agencies. The MWD service area comprises approximately 5,200 square miles and includes portions of the six counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura. There are 26 member agencies of MWD, consisting of 14 cities, 11 municipal water districts and the San Diego County Water Authority (Water Authority). A Board of Directors, currently numbering 37 members, governs MWD. Each constituent agency has at least one representative on the MWD Board. Representation and voting rights are based upon the assessed valuation of property within each constituent agency. The Water Authority has four members on the MWD Board and about 17 percent of the weighted vote. The total population of the MWD service area is currently estimated at approximately 19 million.

MWD’s existing water supplies have been historically sufficient to meet demands within its service area during years of normal precipitation. Although MWD plans and manages reserve supplies to account for normal occurrences of drought conditions, regulatory actions, including, but not limited to, restrictions under the Federal and California Endangered Species Acts, have at times placed limitations on MWD’s ability to provide water to its member agencies. In the future, population growth, regulatory restrictions, increased competition for low-cost water supplies, and other factors such as climate change could impact MWD’s ability to supply its member agencies even in normal years.

MWD Water Supply

MWD’s two major sources of water are from the Colorado River and the State Water Project (SWP).

Colorado River Water: The Colorado River was MWD’s original source of water after its establishment in 1928. The MWD owned and operated Colorado River Aqueduct, is 242 miles long, starting at Lake Havasu and terminating at Lake Mathews in Riverside County.

Under numerous compacts, federal laws, court decisions and decrees, contracts, and regulatory guidelines collectively known as the “Law of the River” that govern the use of water from the Colorado River, California is entitled to 4.4 million acre-feet of Colorado River water annually. Additionally, California is entitled to one-half of any surplus water that may be available for shared use with Arizona and Nevada as determined on an annual basis by the United States Secretary of the Interior. Under the priority system that governs the distribution of Colorado River water made available to California, MWD holds the fourth priority right of 550,000 acre-feet per year and a fifth priority right of 662,000 acre-feet per year. MWD’s fourth priority right is within California’s basic annual apportionment of 4.4 million acre-feet; however, the fifth priority right is outside of this entitlement and therefore is not considered a firm supply of water. MWD also retains a “call” on 100,000 acre-feet per year on water transferred to the Coachella Valley Water

District and the Desert Water Agency, if needed, so long as they pay for the financial obligations associated with the water during the call period.

A study released in July 2014 by NASA and the University of California, Irvine found that the Colorado River basin had lost more than 75 percent of its water between late 2004 and early 2013. The overall loss was nearly 53 million acre-feet, which included a 41 million acre-feet loss of groundwater. Researchers are uncertain as to how much water is left in the groundwater basin

Several fish and other wildlife species either directly or indirectly have the potential to affect Colorado River operations, thus changing the amount of water deliveries to the Colorado River Aqueduct. A number of species that are on either “endangered” or “threatened” lists under the federal and/or California endangered species acts (“ESAs”) are present in the area of the Lower Colorado River. MWD and other stakeholder agencies have developed a multi-species conservation program that allows MWD to obtain federal and state permits for any incidental take of protected species, resulting from current and future water and power operations of its Colorado River facilities and to minimize any uncertainty from additional listings of endangered species.

State Water Project: The State Water Projects (SWP) is owned by the State of California and operated by the State Department of Water Resources (DWR). The SWP’s source waters originate in Northern California with water captured from the Feather River Watershed behind Lake Oroville Dam. The Oroville Dam releases water into the Feather River which is tributary to the Sacramento River, where it combines with other drainages from the western Sierras in the Sacramento-San Joaquin River Delta east of the San Francisco Bay Estuary. MWD receives water pumped from the Harvey O. Banks Pumping Plant in the southern portion of the Sacramento-San Joaquin River Delta, via the 444 mile-long California Aqueduct, to four delivery points near the northern and eastern boundaries of MWD. MWD is one of 29 agencies that have long-term contracts for water service from DWR, and is the largest agency in terms of the number of population served, the share of SWP water to which it is entitled, and the total amount of annual payments made to DWR. MWD’s contract with DWR provides for the ultimate delivery of 1,911,400 acre-feet per year (46 percent of the total SWP entitlement). The SWP was originally intended to meet demands of 4.2 million acre-feet per year. Initial SWP facilities were completed in the early 1970s, and it was envisioned that additional facilities would be constructed as contractor demands increased. Several factors, including public opposition, increased costs, and increased non-SWP demands for limited water supplies, combined to delay the construction of additional facilities.

The quantity of SWP water available for delivery each year is controlled by hydrology, environmental and operational considerations. In addition to its importance to urban and agricultural water users, the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) is of critical ecological importance. The Bay-Delta is the largest estuary on the west coast of the United States and provides habitat for more than 750 plant and animal species. One-hundred-fifty years of human activity have contributed to the destruction of habitat, the decline of several estuarine and anadromous fish species, and the deterioration of water quality. These activities include increasing water demands from urban and agricultural uses, the dredging and filling of tidal marshes, the construction of levees, urban runoff, agricultural drainage, runoff from

abandoned mines, and the introduction of non-native species, thus affecting the supply and reliability of this source.

DWR has altered the operations of the SWP to accommodate species of fish listed under the ESAs. These changes in project operations have adversely affected SWP deliveries. The impact on total SWP operations attributable to the ESA listed Delta smelt and salmon species biological opinions combined is estimated to be one million acre-feet in an average year, reducing SWP deliveries from approximately 3.3 million acre-feet to approximately 2.3 million acre-feet for the year under average hydrology, and are estimated to range from 0.3 million acre-feet during critically dry years to 1.3 million acre-feet in above normal water years. SWP deliveries to contractors for calendar years 2008 through 2012 were reduced by a total of approximately 2.3 million acre-feet as a result of pumping restrictions. Based upon the latest verified information, pumping restrictions that are impacting the SWP allocations for 2013 have reduced exports by approximately 596,000 acre-feet through calendar year 2013.^C

As a result of California experiencing the third year of drought and the driest year on record, the DWR announced a zero percent initial allocation of requested SWP requests for 2014. Due to the late winter storms the state has experienced, that initial allocation was raised to 5 percent in April 2014.^D

5.2 San Diego County Water Authority

The Water Authority service area lies within the foothill and coastal areas of the westerly third of San Diego County, encompassing 952,208 acres (1,488 square miles). When the Water Authority was established in 1944, its service area consisted of 94,707 acres. Of the total population of San Diego County, 97 percent live within the Water Authority's service area. Growth has primarily resulted from the addition and annexation of service areas by member agencies. The City, with a population of 1.3 million served and a service area of 210,726 acres is by far the Water Authority's largest member agency and customer.

The Water Authority's service area is a semi-arid region where the natural occurrence of water from rainfall and groundwater provides a firm water supply for only a small portion of the water demands of the current population. Since 1990, the Water Authority has provided an average of 85 percent of the water supply within its service area. As a wholesaling entity, the Water Authority has no retail customers, and only serves its member agencies.

The Water Authority's mission is to provide its member agencies with a safe and reliable water supply. Historically, the principal source of supply for the Water Authority's service area has been water purchased from MWD for sale to the Water Authority's member agencies. However, drought conditions and population growth in the Water Authority's service area have highlighted the need for diversification of the region's water supplies. Consistent with its mission statement, the Water Authority has actively pursued a strategy of supply diversification that includes the

^C <http://mwdh2o.com/mwdh2o/pages/finance/PDFs/2014-Ser.A-B-FOS.pdf>

^D <http://www.water.ca.gov/waterconditions/>

acquisition and importation of additional water supplies, the development of additional local water supply projects and augmentation of its water supply via local and regional water storage capacity. Water supplies utilized within the Water Authority service area originate from two sources: (1) water imported by the Water Authority and (2) local supplies (such as local runoff, groundwater, recycled water, and prospectively seawater desalination). Since 1990, local supplies have grown to constitute 15 percent of the Water Authority's water supply, and the Water Authority has implemented programs and supported new technologies in order to assist its member agencies in increasing this percentage. Although MWD remains the Water Authority's largest source of imported water, recent years have also seen the diversification of sources of imported water through core and spot water transfers with other agencies.

In late November 2012, the Water Authority's Board of Directors approved a 30-year Water Purchase Agreement with Poseidon Resources, a private investor-owned company, to purchase water from the proposed Carlsbad Desalination Plant, which is a fully-permitted ocean desalination plant and conveyance pipeline. The plant will produce 50 million gallons a day starting in 2016. By 2020, it will generate enough water to meet seven 7 percent of the region's current demands^E. January 8, 2014 marks one year of construction putting the project a little more than 25 percent complete. The project is scheduled to be online by early 2016, though deliveries could begin as soon as the fall of 2015. As of May 29, 2014, the 10-mile pipeline that will connect the Carlsbad Desalination Plant to the Water Authority's distribution system is 50 percent complete.

The Quantification Settlement Agreement (QSA) for the Colorado River was completed in October 2003. This historic agreement was enacted to help settle disputes regarding the persistent over-drafting of the state's 4.4 million acre-foot basic annual apportionment of Colorado River water. The agreement includes a long-term transfer of conserved water from the Imperial Irrigation District to the Water Authority. The QSA also commits the state to a restoration path for the environmentally sensitive Salton Sea and provides full mitigation for these water supply programs. Specific programs under the QSA that directly benefit the Water Authority include the San Diego County Water Authority-Imperial Irrigation District water transfer agreement, which currently transfers 100,000 acre-feet of high priority Colorado River water to the Water Authority and will provide up to 200,000 acre-feet of water a year through water conservation measures in Imperial Valley in 2021. The QSA also allows for the transfer of water from the Imperial Irrigation District (IID), for water conserved through the implementation of the Water Authority performed projects to install concrete linings on portions of the previously earthen All-American and Coachella Canals. The canal lining projects reduced the losses of water that historically occurred through seepage. MWD assigned to the Water Authority its right to develop approximately 77,700 acre-feet of conserved Colorado River water annually.

The QSA ensures that the San Diego region receives a minimum of 75 years of stable Colorado River water supplies. On November 5, 2003, the IID filed a validation action in Imperial County Superior Court, seeking a judicial determination that 13 agreements associated with the San Diego

^E <http://www.sdcwa.org/issue-desal>
<http://carlsbaddesal.com/>

County Water Authority-Imperial Irrigation District water transfer and the QSA are valid, legal and binding. Other lawsuits also were filed contemporaneously challenging the execution, approval and implementation of the QSA on various grounds. All of the QSA cases were coordinated in the Sacramento Superior Court. A final judgment invalidating 11 of the 13 agreements in Phase 1 of the trial was entered on February 11, 2010, and subsequently appealed. On December 7, 2011 the Court of Appeal issued its opinion reversing the judgment and remanding to the trial court for further proceedings. The appellate Court decision resolved many issues in the case, including the validity and constitutionality of the QSA. Trial on compliance with the California Environmental Quality Act was held in November 2012. On June 4, 2013, the court validated the 2003 QSA and related 12 agreements regarding transfers and exchanges of Colorado River water between southern California water agencies. The IID, Coachella Valley Water District, MWD, and Water Authority all sought validation of the agreements from the court under California Water Code section 22762 and California Code of Civil Procedure section 860 et seq., quantifying the amount of Colorado River water each agency may divert and subsequently transfer. The court found the agreements to be valid and adopted in compliance with the requirements of the Brown Act and the California Environmental Quality Act (CEQA). The ruling represents the latest chapter in the longstanding dispute regarding the diversion and use of California's apportionment of the Colorado River under state and federal law.

The Water Authority has encouraged the development of additional local water supply projects such as water recycling and groundwater projects, through the award of Local Water Supply Development ("LWSD") incentives of up to \$200 per acre-foot for recycled water and groundwater produced and beneficially reused within the Water Authority's service area. The purpose of the Water Authority's LWSD program is to promote the development of cost-effective water recycling and groundwater projects, that prevent or reduce a demand for imported water and improve regional water supply reliability. The LWSD Program reimburses member agencies for all, or a portion of the difference between the actual per acre-foot cost of producing recycled water, and the revenue generated by the LWSD participant through the sale of that acre-foot of recycled water (not to exceed \$200 per acre-foot). In February 2008, the program was expanded to include funding for local brackish and seawater desalination projects.

5.3 2009 Comprehensive Water Package

On November 4, 2009, the California State Legislature passed a comprehensive package of water legislation (the "2009 State Water Legislation") that included five bills (four of which were subsequently signed by Governor Schwarzenegger) addressing California's statewide water situation, with particular emphasis on the San Francisco Bay/Sacramento-San Joaquin-Delta (Bay-Delta). The 2009 State Water Legislation included an urban water conservation mandate of 20 percent for most localities in the State by 2020, and new regulations establishing strategic monitoring of groundwater levels around the state. The 2009 State Water Legislation also created two new governmental agencies – the Delta Stewardship Council and the Sacramento-San Joaquin Delta Conservancy. The Delta Stewardship Council is charged with developing and implementing a Delta Plan, which would include the Bay Delta Conservation Plan, upon meeting certain conditions. The Sacramento-San Joaquin Delta Conservancy will implement ecosystem restoration activities in the Bay-Delta. In addition, the 2009 State Water Legislation included

legislation addressing unauthorized Bay-Delta water diversions. At this time, it is not known what effect the 2009 State Water Legislation will have on future water supplies.

Additionally, the 2009 Legislation package included an \$11.1 billion State general obligation bond measure. The water bond measure was originally certified to be on the State's 2010 ballot, but was subsequently pulled due to unfavorable public polling. That same bond measure was subsequently delayed twice. During the current 2013-2014 legislative session, several bills were introduced with the intent of reducing and reconfiguring the dedicated expenditures in the original water bond measure. In late 2014, the legislature introduced the "Water Quality, Supply, and Infrastructure Improvement Act of 2014" which proposed a trimmed down version of the 2009 bond measure for a total of \$7.12 billion. The legislation was subsequently signed by Governor Brown on August 13, 2014 and placed on the November 2014 ballot as Proposition 1 for voter referendum. The ballot measure would fund a variety of state water supply infrastructure projects, such as public water system improvements, surface and groundwater storage, drinking water protection, water recycling and advanced water treatment technology, water supply management and conveyance, wastewater treatment, drought relief, emergency water supplies, and ecosystem and watershed protection and restoration.

5.4 Public Utilities Department

The Department currently purchases approximately 85 to 90 percent of its water from the Water Authority, which supplies the water (raw and treated) through two aqueducts consisting of five pipelines. While the Department imports a majority of its water, it uses three local supply sources to meet or offset potable demands: local surface water, conservation, and recycled water.

The availability of sufficient imported and regional water supplies to serve existing and planned uses within the Department service area is demonstrated in the prior discussion on the water supply reliability of MWD and the Water Authority. The City has been receiving water from the Water Authority since 1947, and during the last 20 years purchased between 139,000 and 235,500 AFY. For CY 2014 water purchases totaled approximately 186,200 AF. Depending upon demands, growth and the success of local water supply initiatives, this could remain somewhat constant or increase up to a projected maximum of 295,998 AFY in 2035 during normal years. For the purpose of this analysis the maximum is used.

5.4.1 Demonstrating the Availability of Sufficient Supplies

Imported Supplies

Section 5, subdivision 11 of the County Water Authority Act states that the Water Authority "as far as practicable, shall provide each of its member agencies with adequate supplies of water to meet their expanding and increasing needs." Depending on local weather and supply conditions, the Water Authority provides between 75 to 95 percent of the total supplies used by its 24-member agencies. As mentioned in Section 4, the Public Utilities Department and other local retail water distributors formed the Water Authority in 1944 for the purpose of purchasing Colorado River water from the MWD.

Local Surface Water Supplies

The Department maintains and operates nine local surface raw water storage reservoirs which are connected directly or indirectly to water treatment operations. In the San Diego region, approximately 13 percent of local precipitation produces surface run-off to streams that supply Department reservoirs. Approximately half of this run-off is used for the municipal water supply, while the remainder evaporates during reservoir storage. In very wet years, the run-off remainder may spill over the reservoir dams and return to the Pacific Ocean. Average rainfall produces less than half of the average run-off in San Diego. The local climate requires about average rainfall to saturate the soils sufficiently for significant surface run-off to occur. Therefore, most of the run-off to reservoirs is produced in years with much greater than average rainfall. Some flooding may occur even during average or below average rainfall years if the annual rainfall is concentrated in a few intense storms.

The use of local water is affected by availability and water resource management policies. The Department's policy is to use local water first to reduce imported water purchases and costs. The Department also operates emergency and seasonal storage programs in conjunction with its policy.

The purpose of emergency storage is to increase the reliability of the imported water aqueduct system. This is accomplished by maintaining an accessible amount of stored water that could provide an uninterrupted supply of water to the City's water treatment facilities, should an interruption to the supply of imported water occur. The management of reservoirs is guided by Council Policy 400-04, which outlines the City's Emergency Water Storage Program. The policy mandates that the Department store sufficient water in active, available storage to meet six-tenths of the normal annual (7.2 months) City water demand requirements (conservation is not included). Active, available storage is that portion of the water that is above the lowest usable outlet of each reservoir.

The monthly emergency storage requirement changes from month-to-month, and is based on the upcoming seven months water demand. This results in a seasonally fluctuating emergency storage requirement, generally peaking in April and reaching its minimum in October. This seasonally fluctuating requirement makes a portion of the required emergency storage capacity available for impounding or seasonal storage.

The purpose of seasonal storage is to increase imported water supply. This is done by storing surplus imported water in the wet winter season for use during the dry summer season. This may also be accomplished by increased use of imported water in lieu of local water in the winter when local water may be saved in reservoirs or groundwater basins for summer use. In addition to increased water yield, this type of seasonal operation also reduces summer peaking on the imported water delivery system.

Conservation

The Department's Water Conservation Program is effective in promoting permanent water savings. Established by the City Council in 1985, the Water Conservation Program accounts for more than 35,650 acre-feet of potable water savings per year. This savings has been achieved by creating a water conservation ethic, adopting programs, policies and ordinances designed to

promote water conservation practices, and implementing comprehensive public information and education campaigns.

The City offers a broad range of conservation methods to help meet the needs of our residential and commercial water customers. These include, but are not limited to, the following:

- Rebate programs for high efficiency toilets, washing machines and commercial water saving devices
- Rebates for replacing grass with sustainable landscapes and micro-irrigation systems
- Residential interior/exterior and commercial landscape survey programs
- Public education and outreach

Research conducted by the City, the Water Authority, and the Water Research Foundation has shown that more than half of residential water-use is outdoors. Therefore, the City has added outdoor conservation programs to focus on water efficient landscaping and irrigation management, which provide the best opportunity to achieve significant water savings.

Tools and services available for customers include:

- Commercial and Residential Water-Use Survey Programs — account for all water-use, determine leaks, and check irrigation systems for proper function and uniform coverage. Residential surveys average 15 percent water savings, while commercial surveys, depending on type of facility, can achieve 15 percent to 25 percent water savings. The current focus is on multi-family surveys.
- Nationally recognized Landscape Watering Calculator — an on-line tool that creates watering schedules based on landscaping features, soil type, and weather data. The Calculator is very popular [<http://apps.sandiego.gov/landcalc/start.do>] and those who have used it are impressed with its ease of use. MWD has adopted this tool and it is available throughout Southern California.
- Water Resources Landscape Database — another tool used to create water budgets and manage irrigation using aerial photographs, GIS maps, weather data, etc. This service has generated significant water savings in City parks, freeway landscapes, schools, and homeowner associations.
- New programs in place include incentives to install water efficient irrigation equipment and evapo-transpiration controllers (smart irrigation clocks that use weather data to set watering schedules); as well as incentives to replace grass with sustainable landscapes.
- The Water Conservation Section teamed up with the Transportation & Storm Water Department to include rain barrels as an item that can receive a rebate through the “Outdoor Water Conservation Rebate Program.” Rain barrels are used to collect rainwater from hard surfaces such as household rooftops. When citizens install a rain barrel at their home, they are helping to maintain a healthy urban watershed by reducing the demand on the potable water system, while also reducing the amount of wet weather runoff that is collected and sent into the public storm water system.

- ‘San Diego Municipal Code (SDMC) 67.06 Water Submeters’ was adopted in April 2010, to encourage water conservation in multi-family residential and mixed-use buildings by requiring the use of water submeters for each individual residential unit. Billing individual residential units based on the actual amount of water consumed in the unit creates a financial incentive for residents of multi-family residential units to conserve water.

Planning efforts to increase water conservation is an ongoing process. The aforementioned water conservation programs undergo periodic reevaluation to ensure the realization of forecasted savings. Additionally, changes in water conservation technologies may require reassessment of long-range plans. The Department continues to work with proven water conservation programs, while including irrigation management programs to maximize water savings; regularly examines new technologies and annually checks progress towards conservation goals; and, continues to work collaboratively with MWD and the Water Authority to formulate new conservation initiatives. The City’s water conservation report, prepared annually, is available at <http://www.sandiego.gov/water/pdf/waterreuse/2013/fy13annualwater130101.pdf>. The report provides an ongoing assessment and status update, redirecting or enhancing efforts as needed. The programs outlined in the document undergo periodic reevaluation to ensure the realization of forecasted savings.

Drought Management

On January 17, 2014, California Governor Jerry Brown declared a drought in California. On February 11, 2014, the Metropolitan Water District of Southern California’s Board of Directors declared a Water Supply Alert throughout its 5,200-square-mile service area as part of a set of comprehensive actions to address the state’s unprecedented dry conditions. Additionally, on February 13, 2014, the San Diego County Water Authority’s Board of Directors unanimously called upon the region’s residents, businesses and institutions to increase water conservation efforts in response to severe drought conditions across California. The Board also approved, notifying the Water Authority’s 24-member agencies, including the City of San Diego, which is at the Level 1 Drought Watch of the Model Drought Response Ordinance.

The City has an extensive list of permanent water use restrictions that are outlined in San Diego Municipal Code Section §67.3803. These restrictions were updated several times during the last California drought. They are in effect every day in San Diego and include the following limitations:

- a) no runoff/excessive irrigation
- b) repair leaks upon discovery or within seventy-two hours of notification
- c) no watering of paved areas
- d) no overfilling swimming pools and spas
- e) no non- recirculation decorative water fountains
- f) car washing only in a commercial car wash or using a hose with shutoff nozzle or a bucket
- g) new buildings must recycle cooling system water and car wash water
- h) restaurants will only serve and refill water upon request
- i) hotel guests must have the option of not laundering towels and linens daily

- j) no watering after 10 am and before 4 pm (winter)/before 6 pm (summer)

San Diego's permanent water use restrictions are typically similar to the restrictions many local water agencies implement when they invoke their Level 1 water restrictions.

The City's "Drought Response Level 1 – Drought Watch Condition" is typically invoked when the City Council finds a reasonable probability, that there will be a supply shortage and that a consumer demand reduction of up to ten percent is required in order to ensure that sufficient supplies will be available to meet anticipated demands. The Level 1 Drought Watch Condition adds additional water conservation measures that are added to the City's existing permanent water restrictions outlined in SDMC §67.3803. These measures include:

- 1) landscape irrigation limited to assigned three days per week
- 2) when watering without an irrigation system a shut-off nozzle or garden hose sprinkler system on a timer is required
- 3) washing vehicles limited to the same schedule as irrigation (except for: boats which may be washed after use; vehicles with health/safety issues; at a commercial carwash that recycles water)
- 4) use recycled or non-potable water for construction purposes
- 5) fire hydrants for firefighting only
- 6) construction operations can use water only as required by regulatory agencies
- 7) irrigation is not permitted during rain event

The San Diego City Council invoked a "Drought Response Level 1 – Drought Watch Condition" on May 20, 2014, that went into effect on July 1, 2014.

Recycled Water Supplies

In FY 2014, the beneficial reuse of the recycled water was 13,221 AF: 8,417 AF from the NCWRP and 4,804 AF from the SBWRP. Although landscape irrigation continues to be the leading use of the recycled water, the customer base has become more varied over the years with an increase in the number of industrial and dual plumbed meter connections.

Proactive marketing activities targeting existing irrigation customers, to encourage them to convert their cooling systems to recycled water, coupled with outreach efforts to connect new customers have been successful, as recycled water meter connections have increased over 41 percent since 2007. As of June 2014, the City provides recycled water service to 576 retail meters and 4-5 wholesale meter connections, including the City of Poway, Olivenhain Municipal Water District (3 connections) and Otay Water District. The 2013 top ten retail customers included the City of San Diego Park & Recreation Department, Miramar Marine Corps Air Station Miramar, Black Mountain Ranch and Santa Luz HOA, Caltrans, El Camino Memorial Park, U.S. International Boundary & Water Commission, The Irvine Company, Qualcomm, Village Nurseries (Miramar Nursery) and the City of San Diego's Miramar Landfill.

In FY 2014, financial incentives from the sale of recycled water resulted in nearly \$3.2 million in savings towards imported water purchases. The financial incentives are a result of local water resources development agreements with Metropolitan Water District and the San Diego County Water Authority.

The Department, in cooperation with the Park & Recreation Department, has aggressively pursued the retrofitting of City parkland, street landscaping and open space to use recycled water for irrigation; sites fronting recycled water distribution pipelines were targeted. In 2007 only 23 recycled water meters were serving City sites; as of June 2014 that number has grown to 84 meter connections. The Departments are currently working on retrofitting four additional parks/open spaces. The irrigation retrofits are funded in part by Federal and State grants.

Public Utilities Department's Capital Improvement Program

The Department reevaluates the Water projects contained in the Capital Improvements Program (CIP) and the timing thereof periodically. Changes to the CIP are made to reflect changing priorities within the water system and occur as a result of project scope changes, date revisions, project sequencing, and operational considerations. The Department expended approximately \$840 million from July 1, 2003 through June 30, 2013 on CIP projects. Improvements included projects to upgrade and expand water treatment plants, rehabilitate raw and treated water storage facilities, construct major transmission pipelines, replace and/or upgrade existing pump stations, replace cast iron water mains citywide, expand the recycled water system, and other new supply initiatives. In November 2013, the City Council adopted water rate increases of 7.25 percent beginning on January 1, 2014 and 7.5 percent beginning on January 1, 2015. These rate increases will provide needed revenue to fund the upgrade and expansion of the water system in order to ensure a reliable water supply for all City residents and meet Department of Public Health mandates.

In 2009, the Department initiated a facilities master plan to identify long-term facility needs. With the completion of the water master plan in 2011, over 80 projects were identified through the master planning effort for CIP implementation of fiscal years 2012-2032. Project scopes were developed from facility condition assessments and system evaluations. The prioritization of CIP projects are based on the adopted City Council Policy 800-14 (CP 800-14) as well as inputs from Independent Rates Oversight Committee members and operational staff. The list of prioritized projects will be the basis for 2012-2032 CIP program.

Summary of Supplies

Historic imported water deliveries from the Water Authority to the Public Utilities Department and local surface water, conservation savings and recycled water deliveries are shown in **Table 5-1**.

Table 5-1
Historic Imported, Local and Recycled Water Demands*
Public Utilities Department (Source: 2010 UWMP)

Fiscal Year	Imported Water (acre-feet)	Local Surface Water (acre-feet)	Conservation¹ (acre-feet)	Recycled Water (acre-feet)	Total² (acre-feet)
1990	233,158	22,500	-	-	255,658
1995	162,404	59,024	8,914	-	230,342
2000	207,874	39,098	17,410	3,250	267,632
2005	204,144	26,584	29,410	4,294	264,432
2010	188,337	13,117	34,317	12,173	247,944

Table 5-1 Notes:

¹Conserved water results in savings and is not a direct supply.

²Total includes water supplied and conserved.

*Includes retail and wholesale demands

5.4.2 Plans for Acquiring Additional Supplies

Future Supplies

The Department completed the City Council approved 2012 Long-Range Water Resources Plan (2012 LRWRP) on December 10, 2013. The 2012 LRWRP is a high level strategy document that evaluates water supply and demand-side objectives against multiple planning objectives. The 2012 LRWRP was an open participatory – stakeholder driven process that evaluated over 20 water supply options such as water conservation, recycled water, groundwater storage, brackish groundwater desalination, rainwater harvesting, graywater and potable reuse. The plan takes a long-range viewpoint through the year 2035 in addressing risk and the uncertainty of future water supply conditions. It is a plan that sets the tone or direction of where the City places its efforts in developing local water supplies.

Conservation and water recycling programs have been implemented and are under investigation for ways to be expanded or increased. The Department is also investigating the development of groundwater and potable reuse.

Conservation

Like many agencies in California, the City is committed to reducing its per capita water consumption by at least 20 percent by the year 2020. Aside from the existing programs listed in Section 5.4.1 of this report, the City is also evaluating the following programs to help reduce overall water consumption:

- Water budget based billing for irrigation only customers - An effort is currently underway to evaluate billing irrigation customers based on their ability to meet property specific water use budgets, and implement a tier rate structure that encourages usage within water budgets.

- Conservation-oriented rate structures - The new rate structure, which took effect in January 2014, adds a fourth new tier for single-family residential customers that recognizes water conservation efforts, and increases the rates for higher tiers to discourage high volume usage.
- Automated Meter Interface - The City is starting to install smart water meters in monthly billed accounts. These meters allow remote access to consumption patterns via a web portal, and give water customers data that they can monitor and use to manage better their water consumption.

Recycled Water

Recycled Water Study:

The Recycled Water Study was presented to and unanimously accepted by the City Council on July 17, 2012, following a three-year effort that included extensive stakeholder involvement. The Study can be located at the following link:

<http://www.sandiego.gov/water/pdf/waterreuse/2012/recycledfinaldraft120510.pdf>.

During the 2008 to 2010 Point Loma Wastewater Treatment Plant (Point Loma) permit modification process, San Diego Coastkeeper and the San Diego Chapter of the Surfrider Foundation entered into a Cooperative agreement with the City to conduct the Recycled Water Study (Study). In accordance with the agreement, the San Diego Coastkeeper and the San Diego Chapter of the Surfrider Foundation did not oppose the United States Environmental Protection Agency's (USEPA) decision to grant the permit modification. The City Council authorized the execution of the Cooperative Agreement on February 18, 2009. The modified Permit allows Point Loma to continue operating as a chemically enhanced primary treatment facility (CEPT) for five years until July 31, 2015, when the permit must be renewed rather than upgrading the treatment system to meet secondary standards as required in the federal Clean Water Act. The Study concluded meeting all terms of the Agreement with Coastkeeper and Surfrider.

The Recycled Water Study identified five (5) Reuse Alternatives. Non-Potable Reuse, Indirect Potable Reuse, and wastewater off-load to the Point Loma are the common components of each of the five alternatives. All reuse alternatives presented in the study achieve the study goals, provide a bold vision for the future water reuse in the Metro Service Area, and provides potential savings to ratepayers. For additional details on the Reuse Alternatives, please see the Recycled Water Study Report Dated July 2012 in the above link.

Potable Reuse:

Potable Reuse is an approach the City is considering for maximizing the use of recycled water. Recycled water that is used for non-drinking uses like irrigation and industrial processes, would undergo advanced water purification (AWP) to render it safe for reuse as a drinking water supply. The AWP process uses multiple treatment barriers to remove contaminants from the water and prevent them from re-entering the water supply. It begins with membrane filtration, followed by reverse osmosis, and ends with advanced oxidation. The result is purified water that meets all drinking water standards and is similar in quality to distilled water.

There are two major types: Indirect Potable Reuse (IPR) and Direct Potable Reuse (DPR). With IPR, the purified water is sent to an environmental buffer; for the City's IPR concept, San Vicente Reservoir would be the environmental buffer. The water in San Vicente is treated at a drinking water treatment plant before it is distributed for drinking purposes. Direct potable reuse differs in that there is no environmental buffer. The California Department of Public Health is mandated to determine the feasibility of establishing DPR regulations. Industry experts expect that DPR regulatory criteria to include the use of additional treatment or engineered storage barriers to compensate for the absence of an environmental buffer. The City is monitoring the development of DPR regulations and how they might influence the viability of potable reuse implementation.

Water Purification Demonstration Project:

In order to assess the feasibility of indirect potable reuse with reservoir augmentation (IPR/RA), the City initiated a Water Purification Demonstration Project (Demonstration Project). The Demonstration Project evaluated the feasibility of using advanced water purification (AWP) technology to produce water that can be sent to San Vicente Reservoir, subsequently treated, and later be distributed as potable water.

As part of the Demonstration Project, the City tested and operated a one-million gallon per day demonstration-scale AWP Facility from June 2011 to August 2012. The purified water was routinely tested to determine the effectiveness of the treatment equipment, and operating data was gathered to develop a cost estimate for full-scale facilities. A study of San Vicente Reservoir was also conducted to establish residence time and short circuiting conditions of the purified water in the reservoir. An extensive public outreach and education program was implemented to educate the public about the potential benefits and implications of an IPR/RA project. The City also coordinated with the State's regulatory agencies to help define the requirements for an IPR/RA project. The Final Project reports have been completed and are available at the following link: www.purewatersd.org/projectreports. The Demonstration Project reports were presented to full City Council on April 23, 2013. The City Council adopted the Demonstration Project Reports and directed staff to determine a preferred implementation plan and schedule that considers potable reuse options for maximizing local water supply and reduced flows to the Point Loma Wastewater Treatment Plant. This follow on effort, now known as the Pure Water San Diego Program, is described in more detail below.

Pure Water San Diego Program:

The Department's Pure Water San Diego Program (Program) is a 20-year program ending in year 2035. The program will create a safe and reliable local water supply through potable reuse, while reducing the Point Loma Wastewater Treatment Plant's ocean discharges and accomplishing secondary equivalency.

Potable Reuse is an approach the City is considering for maximizing the use of recycled water. Recycled water that is used for non-drinking uses like irrigation and industrial processes, would undergo advanced water purification (AWP) to render it safe for reuse as a drinking water supply. The AWP process uses multiple treatment barriers to remove contaminants from the water and prevent them from re-entering the water supply. It begins with membrane filtration, followed by

reverse osmosis, and ends with advanced oxidation. The result is purified water that meets all drinking water standards and is similar in quality to distilled water.

There are two major types: Indirect Potable Reuse (IPR) and Direct Potable Reuse (DPR). With IPR, the purified water is sent to an environmental buffer; for the City's IPR concept as studied in the Demonstration Project, San Vicente Reservoir would be the environmental buffer. The water in San Vicente is treated at a drinking water treatment plant before it is distributed for drinking purposes. Direct potable reuse differs in that there is no environmental buffer. The California Department of Public Health is mandated to determine the feasibility of establishing DPR regulations. Industry experts expect that DPR regulatory criteria to include the use of additional treatment or engineered storage barriers to compensate for the absence of an environmental buffer. The City monitoring the development of DPR regulations and how they might influence the viability of potable reuse implementation.

For the Pure Water San Diego Program, Department staff have completed most of the technical studies to refine system-wide reuse concepts developed in the Recycled Water Study (July 2012), are developing a cost-sharing framework, serving on an advisory group to an Expert Panel on Direct Potable Reuse (DPR) and Recycled Water, and are continuing tours of the Advanced Water Purification Facility, speakers bureau presentations and community events participation

In addition to the above, Department staff is engaged in the preparation of the National Pollution Discharge Elimination Permit (modified permit) for Point Loma which expires July 31, 2015. The draft modified permit application will be brought forward for City Council consideration in October 2014. Staff is also developing a regulatory and legislative strategy related to Point Loma that will require City Council input and involvement.

The Department is working on implementing the various facets of the Pure Water San Diego Program. Implementation strategy tasks include facility siting studies, engaging key regulatory agencies to develop a modified NPDES permit renewal application which secures long-term compliance with discharge standards at Point Loma through potable reuse and secondary equivalency, and establishing a financing plan and cost-sharing principles with other public agencies that use the City's wastewater system.

This comprehensive effort will provide a secure and reliable long-term local water supply for San Diego while resolving the decade's long issues associated with Point Loma.

Groundwater

There are several groundwater basins in the San Diego region that the City has rights, concerns jurisdiction or otherwise an interest in developing for municipal supply or other beneficial use. These basins are:

- San Pasqual Basin
- Mission Valley Basin
- Santee/El Monte
- Tijuana Basin
- San Diego Formation

The groundwater quality from these basins is predominantly brackish. Improved technologies provide consideration of affordable water sources, such as brackish groundwater, that were not available a few decades ago. Groundwater is a viable alternative and is part of the City's planning efforts. Local water supply projects, particularly groundwater exploration, benefit City rate payers, offer drought protection, and are locally controlled.

The San Diego City Council adopted the San Pasqual Groundwater Management Plan (GMP) in 2007. Several management actions outlined in the GMP are currently being implemented.. For the next several years, basin activities such as surface water and groundwater monitoring programs, water quality testing, basin water budget, and basin capacity studies will be the focus for understanding, protecting and evaluating the long-term sustainable use of the San Pasqual Basin as a water supply source.

The City is the Monitoring Entity for the San Pasqual Basin as identified by the California Statewide Groundwater Elevation Monitoring (CASGEM) program. Working cooperatively with the California Department of Water Resources (DWR), the City established a network of monitoring wells for CASGEM to regularly and systematically track seasonal and long-term trends in groundwater elevations for this alluvial groundwater basin. Included in the monitoring network plan are three multi-level monitoring wells that were installed by the United States Geological Survey under a cooperative agreement with the City. Participation in the statewide CASGEM program allows basin groundwater data to be maintained and readily available through DWR's public data base. The City is reaching out to local agencies and pursuing a Voluntary Cooperative for monitoring entity status of the El Monte/Santee Basin which is located in the upper reach of the San Diego River.

On May 30, 2014, the City completed a Salinity and Nutrient Management Plan (SNMP) for the San Pasqual Basin in compliance with Recycled Water Policy 2009 that was adopted by State Water Resources Control Board (State Board). The City facilitated a stakeholder driven basin-wide approach to complete this effort. The framework for the SNMP incorporated components from the SNMP guidelines (*Salinity/Nutrient Management Planning in the San Diego Region (9), Welch 2010*) adopted by the State Board. The SNMP identified excessive levels of salts and nutrients in areas of the basin and provides Management strategies for protecting and improving groundwater quality for agriculture, potable water supply and for other beneficial groundwater uses.

The City has been investigating Mission Valley Aquifer. Mission Valley is a narrow, east-west trending valley carved out by the San Diego River as it drains westward from Mission Gorge to the Pacific Ocean. The most conducive portion of the aquifer lies within the extent of an historical well field where the City has retained ownership of the property and where a substantial portion is overlain by Qualcomm Stadium and its parking lot. Part of the history is the establishment of the City's pueblo water right, a prior and paramount right to all of the water of the San Diego River (surface and underground). In 1963 a fuel tank farm was built in Mission Valley at the mouth of Murphy Canyon, know as Mission Valley Terminal (MVT). Underground fuel contamination was suspected to being in 1986. From 1986 to 1991 approximately 200,000 gallons of gasoline was released underground from the MTV located upstream of Qualcomm Stadium, and contaminated the aquifer. The contamination extended from the tank farm, beneath Qualcomm property, to

approximately where Interstate 805 crosses the San Diego River. Although remediation of the Mission Valley Aquifer has been ongoing for a period of time, the City is waiting for remediation to be complete before resuming its plans for development of the aquifer for municipal supply.

The City has been producing groundwater from the Santee – El Monte basin from two municipal supply wells. One well is located just downstream of the San Vicente Reservoir and the other is located just downstream of the El Capitan Reservoir. The City is evaluating the expansion of its groundwater production facilities at each location to maximize yield. The City's existing San Vicente Production well was constructed in 2004 and pumps a maximum of 600 gallons per minute. The well conveys groundwater directly to the City's existing raw water line from the reservoir and ultimately to the City's Alvarado Treatment Plant. The well located just downstream of the El Capitan reservoir is installed in a granitic rock formation and extracts water from a fractured rock system at a yield of 50 gallons per minute. This well also conveys groundwater to a raw water pipeline coming from the dam to supply the Alvarado Treatment Plant.

The City desires to use the San Diego Formation for groundwater municipal supply and seeks to manage the safe yield of the aquifer system in a prudent and efficient manner. The City has been engaged in investigating to gain a better understanding of the San Diego Formation Basin for many years. The City has been better able to characterize the water quality and quantity in the San Diego Formation through aquifer testing and monitoring well installation that have occurred since 2007. In addition, the City has been working with the United States Geological Survey to develop an integrated and comprehensive understanding of the geology and hydrology of the San Diego Formation, and to use this understanding to evaluate a sustainable, long-term environmental sound use of the formation for municipal supply.

Section 6 - Projected Demands

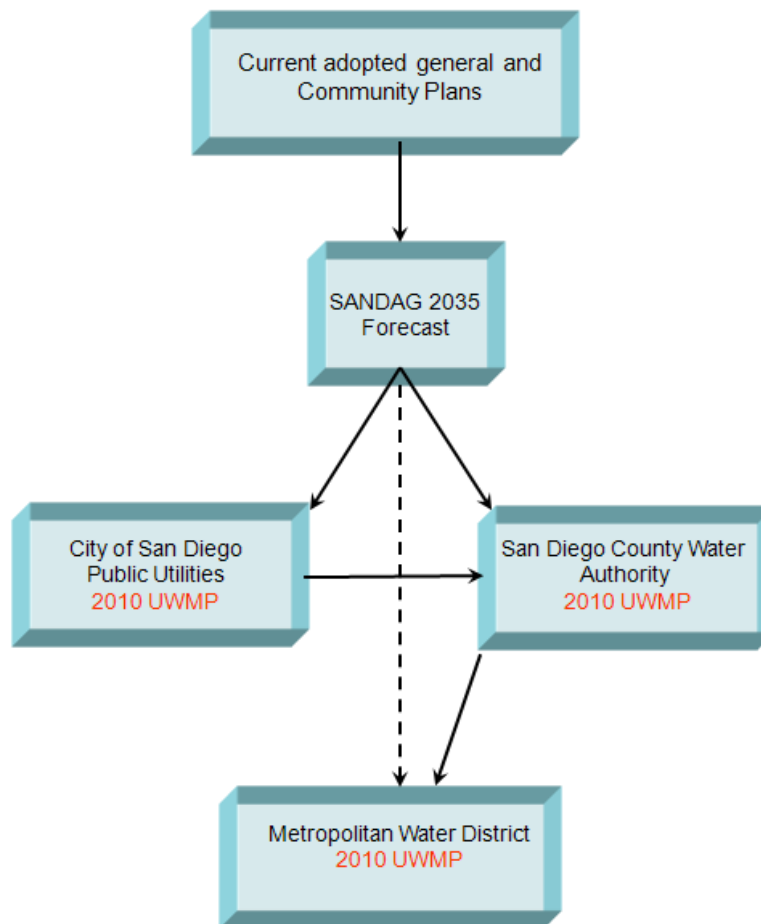
Approximately every three years the Public Utilities Department (Department) calculates projected water demands within its service area for planning purposes. A computer model is used (IWR-MAIN) to break down water-use by major water-use sectors: Commercial, Industrial, Residential and Public uses. Using past water-use data from the Department and demographic data provided by SANDAG land use, the model is able to correlate the data to determine sector water demands. Using this correlated data, future demographic data is used to project water demands. The model also accounts for water conservation, weather and water rate changes.

In addition to the Department, the Water Authority and MWD use regional growth forecasts to calculate projected water demands within their respective service areas. This provides for consistency between the retail and wholesale agencies projected water demands, thereby ensuring that adequate supplies are being planned for the Department's existing and future water users. The SANDAG forecasts are based on adopted community plan land use, but not citywide zoning. SANDAG forecasts the number of residents, dwelling units, and employees in an area, but not square footage, hotel rooms, or visitors (non-residents or non-employees). For urban areas the smallest forecast geography is typically at the block level, but for suburban and less developed areas the forecast geography can be larger. SANDAG typically updates the regional growth forecast every three to four years. The Public Utilities Department water demand projections, based on the SANDAG Series 12 Forecast land use, are incorporated in the City's 2010 UWMP. These projections are then forwarded to the Water Authority for use in the preparation of their UWMP, which is further incorporated into MWD's UWMP to calculate the ultimate water demands of the region (see **Figure 6-1**).

The Department updates its UWMP every five years. The 2010 UWMP, originally scheduled for completion in December 2010, was completed and adopted in June 2011. The time extension granted for the completion of the 2010 UWMP was due to the new SBX7-7 reporting requirement that needed to be incorporated into the 2010 UWMP. SBX7-7, which is part of the 2009 Water Legislation, requires urban water agencies to reduce statewide per capita water consumption 20 percent by 2020.

The Governor has recently signed Assembly Bill (AB) 2067 which amend the water code extending the deadline for submitting 2015 UWMP. The bill would require each urban water supplier to submit its 2015 UWMP to the Department of Water Resources by July 1, 2016.

FIGURE 6-1
WATER DEMAND PROJECTIONS



The demands from the 2010 UWMP are used throughout this Report. The historical and projected water demands for a normal year are shown in **Table 6-1**.

As part of the requirements for complying with SB 610, **Table 6-7** and **Table 6-8** show the single-dry year and consecutive multiple-dry year demands. All tables in this section are based on data from the 2010 UWMP.

TABLE 6-1
PAST, CURRENT, AND PROJECTED WATER DELIVERIES
(AFY)

Water Use Sector	2005				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	217,983	77,864	0	0	77,864
Multi-family	28,443	39,220	0	0	39,220
Commercial	14,468	33,099	0	0	33,099
Industrial	253	4,276	0	0	4,276
Institutional/Governmental	2,341	16,842	0	0	16,842
Landscape Irrigation	7,245	27,877	0	0	27,877
Total	270,733	199,178	0	0	199,178

Source: City of San Diego Public Utilities Report U02-P10715.

Water Use Sector	2010				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	220,862	62,367	0	0	62,367
Multi-family	28,361	36,324	0	0	36,324
Commercial	14,542	27,244	0	0	27,244
Industrial	186	2,325	0	0	2,325
Institutional/Governmental	2,321	13,774	0	0	13,774
Landscape Irrigation	7,327	20,257	0	0	20,257
Total	273,599	162,291	0	0	162,291

Source: City of San Diego Public Utilities Report U02-P100715.

Table 6-1, Continued

Water Use Sector	2015				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	231,346	75,922	0	0	75,922
Multi-family	32,082	47,266	0	0	47,266
Commercial	14,376	31,617	0	0	31,617
Industrial	186	2,071	0	0	2,071
Institutional/Governmental	2,302	13,359	0	0	13,359
Landscape Irrigation	7,583	25,452	0	0	25,452
Total	287,587	195,688	0	0	195,688

Water Use Sector	2020				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	236,639	79,992	0	0	79,992
Multi-family	37,330	56,700	0	0	56,700
Commercial	14,783	33,541	0	0	33,541
Industrial	186	2157	0	0	2157
Institutional/Governmental	2,302	13,772	0	0	13,772
Landscape Irrigation	7,869	27,247	0	0	27,247
Total	298,582	213,409	0	0	213,409

Water Use Sector	2025		2030		2035	
	Metered		Metered		Metered	
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)
Single-family	241,491	83,370	244,138	85,633	245,682	86,471
Multi-family	42,662	66,070	47,910	75,328	52,420	82,781
Commercial	14,681	34,012	14,100	33,116	13,853	32,740
Industrial	176	2,077	166	1,995	166	1,967
Institutional/Governmental	2,247	13,639	2,172	13,399	2,154	13,329
Landscape irrigation	8,192	28,893	8,162	29,301	8,543	30,698
Total	308,505	228,061	315,534	238,772	321,337	247,986

Table 6-2 summarizes the current and planned water sources the City is relying on to meet future demands.

TABLE 6-2
PLANNED WATER SUPPLY SOURCES
(AFY)

Water Supply Sources	Wholesaler Supplied Volume (yes/no)	2015	2020	2025	2030	2035
San Diego County Water Authority	Yes	201,719	221,458	237,622	249,728	260,107
Supplier produced surface water ^(a)		29,000	29,000	29,000	29,000	29,000
Supplier produced groundwater		500	500	500	500	500
Transfers In		0	0	0	0	0
Exchanges In		0	0	0	0	0
Recycled Water ^(b)		9,253	9,253	9,253	9,253	9,253
Desalinated Water		0	0	0	0	0
Other		0	0	0	0	0
Total		240,472	260,211	276,375	288,481	298,860

Notes:

^(a) Local surface water estimates provided by City, 2011.

^(b) Recycled water excludes recycled water sold to other agencies and is from table entitled, "NCWRP and SBWRP Summary of Baseline Demands", provided by the City on April 22, 2011.

6.1 Water Sales to Other Agencies

Potable Water

The City, through past agreements, sells treated water to the California American Water Company (Cal-Am) which provides water service to the cities of Coronado and Imperial Beach, and Naval Air Station North Island. The population of Naval Station North Island is located within the City of Coronado, whereas the other military bases that the City serves are within the City. The City also sells untreated water to Santa Fe Irrigation District and San Dieguito Water District. **Table 6-3** presents the water sales to other agencies.

Per the agreement between the City and Cal-Am, only local surface water is sold to Cal-Am to provide water to supply Cal-Am customers. A portion of City residents in the South Bay area are also served by Cal-Am and can be served by imported water as well. Per the agreement between the City and the City of Del Mar, the City takes deliveries of water, which the City of Del Mar purchases from the Water Authority, through the Second Aqueduct Connection at Miramar. This water is then treated at the City's Miramar WTP and transported to the City of Del Mar through several interconnections.

The City has agreements to provide surplus treated water to Otay Water District and untreated exchange water to Ramona Municipal Water District. These water deliveries occur infrequently and for short periods of time, and are therefore not shown in **Table 6-3**.

TABLE 6-3
SALES TO OTHER AGENCIES-POTABLE
(AFY)

Water Distributed	2005	2010	2015	2020	2025	2030	2035
California American Water Company	13,311	11,462	13,153	13,395	13,452	13,757	13,988
Santa Fe Irrigation District and San Dieguito Water District ^(a)	2,012	7,227	7,596	7,983	8,391	8,819	9,268
City of Del Mar ^(b)	1,324	1,058	1,112	1,168	1,228	1,290	1,356
Naval Air Station North Island	1,204	1,568	1,568	1,568	1,568	1,568	1,568
Total	14,515	13,030	14,721	14,963	15,020	15,325	15,556

Notes:

^(a) Through a joint agreement, the City supplies raw water from local surface water supplies to Santa Fe Irrigation District/San Dieguito Water District, and treated water to the other agencies. This water supply is not included in total since the supply is not included in the local surface water supply.

^(b) City of Del Mar not included in total as the City is treating water for Del Mar that is provided by Water Authority.

Recycled and Non-Revenue Water

The City has three separate agreements to sell recycled water. Olivenhain Municipal Water District and the City of Poway are provided recycled water from the City's North City Water Reclamation Plant while Otay Water District receives recycled water from the City's South Bay Water Reclamation Plant.

Non-Revenue Water (NRW) is water that is unaccounted for or unbilled water consumption. Unaccounted for water can be attributed to unauthorized consumption, meter inaccuracies, data errors, leakage on mains, leakage and overflow at storage and leakage at service connections. Using metered demand and total City delivered values, NRW was computed as 8.2 percent in 2012. Water use for firefighting, line flushing and other authorized, but unbilled use is classified in the computation of NRW as unbilled consumption.

City staff deemed it reasonable to assume this percent system loss could be maintained in future years given the City's aggressive program of leak detection and repair. The City is going forward with an automated meter reading system that could improve billing accuracy, better quantify real versus apparent losses and identify customer leaks. Thus, NRW is held constant in the projections at 9.0 percent for forecast years. **Table 6-4** represents the City's additional water uses (recycled water) and NRW.

TABLE 6-4
ADDITIONAL WATER USES AND LOSSES
(AFY)

Water Use	2005	2010	2015	2020	2025	2030	2035
Recycled water	4,294	7,656	9,253	9,253	9,253	9,253	9,253
Non-revenue water	10,404	21,909	20,810	22,586	24,041	25,131	26,065
Total	14,698	29,565	30,063	31,839	33,294	34,384	35,318

Notes:

1. Source for recycled water: 2005 from Table 2-8 of the City's 2005 Urban Water Management Plan. 2010 from NCWRP and SBWRP beneficial reuse summary tables with wholesale deliveries excluded provided by the City on March 2, 2011. 2015 and later from table entitled, "NCWRP and SBWRP Summary of Baseline Demands", provided by the City on April 22, 2011.
2. Recycled water is City use only and excludes recycled water sold to other agencies.
3. Source for non-revenue water: For 2005, Table 2-8 of the City's 2005 Urban Water Management Plan with 4.3% assumption. For 2010 to 2035, City of San Diego Public Utilities, Update of Long-Term Water Demand Forecast, Table 6-5, Water Demand Forecast with Normal Weather, June 2010.

Table 6-5 is a summary of and displays City's past water use from 2005 and 2010 with projected water use shown for 2015 thru 2035.

TABLE 6-5
TOTAL WATER-USE
(AFY)

Water Distributed	Total Water Use (AFY)						
	2005	2010	2015	2020	2025	2030	2035
Total Water Deliveries (Table 6-1)	199,178	162,291	195,688	213,409	228,061	238,772	247,986
Sales to Other Water Agencies (Table 6-3)	14,515	13,030	14,721	14,963	15,020	15,325	15,556
Additional Water Uses and Losses (Table 6-4)	14,698	29,565	30,063	31,839	33,294	34,384	35,318
Total	228,391	204,886	240,472	260,211	276,375	288,481	298,860

The analysis in **Table 6-6** below compares the projected normal water supply and customer demands from 2010 to 2035, in five-year increments.

TABLE 6-6
PROJECTED NORMAL SUPPLY AND DEMAND COMPARISON
(AFY)

	2015	2020	2025	2030	2035
Supply totals	240,472	260,211	276,375	288,481	298,860
Demand totals	240,472	260,211	276,375	288,481	298,860
Difference (supply minus demand)	0	0	0	0	0

6.2 Projected Single-dry Year Water Supply and Demand

Table 6-7 provides a comparison of a single-dry year water supply with projected total water use over the next 25 years, in five-year increments. The City's demands in single-dry years are projected to be higher similar in proportion to the increase in regional water demands projected in the Water Authority's 2010 UWMP. An increase in use for landscape irrigation accounts for most of the increase in demands. It is assumed that recycled water demands would not increase in single-dry years. The wholesale water supplies from the Water Authority are assumed to increase to meet the difference between the City's increased water demands and reduced local water supplies.

TABLE 6-7
PROJECTED SINGLE-DRY YEAR SUPPLY AND DEMAND COMPARISON
(AFY)

	2015	2020	2025	2030	2035
Supply totals	255,040	276,526	293,895	307,230	318,586
Demand totals	255,040	276,526	293,895	307,230	318,586
Difference (supply minus demand)	0	0	0	0	0

6.3 Projected Multiple-dry Year Water Supply and Demand

Table 6-8 compares the total water supply available in multiple-dry water years with projected total water use over the next 25 years. The City's demands in multiple-dry years are projected to be higher, similar in proportion to the increase in regional water demands projected in Water Authority's 2010 UWMP. It is presumed that recycled water demands would not increase in multiple-dry years. The wholesale water supplies from Water Authority are assumed to increase to meet the difference between the City's increased water demands and reduced local water supplies. Multiple-dry year scenarios represent hot, dry weather periods which may generate urban water demands that are greater than normal.

No extraordinary conservation measures are reflected in the demand projections. The recycled water supplies are assumed to experience no reduction in a dry year.

TABLE 6-8
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE
DRY YEAR PERIOD ENDING IN 2035
(AFY)

		Supply and Demand Comparison – Multiple-dry Year Events				
		2015	2020	2025	2030	2035
Multiple-dry year First year supply	Supply totals	257,587	278,451	296,319	309,230	320,382
	Demand totals	257,587	278,451	296,319	309,230	320,382
	Difference	0	0	0	0	0
Multiple-dry year Second year supply	Supply totals	267,323	288,723	306,726	320,467	332,038
	Demand totals	267,323	288,723	306,726	320,467	332,038
	Difference	0	0	0	0	0
Multiple-dry year Third year supply	Supply totals	281,466	303,004	322,166	334,720	346,823
	Demand totals	281,466	303,004	322,166	334,720	346,823
	Difference	0	0	0	0	0

Section 7 - Conclusion - Availability of Sufficient Supplies

The Project is consistent with water demand assumptions in the regional water resource planning documents of the City, the Water Authority and MWD. The Public Utilities Department receives the majority of its water supply from MWD through the Water Authority. In addition, MWD and the Water Authority have developed water supply plans to improve reliability and reduce dependence upon existing imported supplies. MWD's Regional Urban Water Management Plan and Integrated Resources Plan, the Water Authority's 2010 UWMP and annual water supply report include projects that meet long-term supply needs through securing water from the State Water Project, Colorado River, local water supply development and recycled water.

The forecasted normal year water demands compared with projected supplies for the Public Utilities Department are shown in **Table 7-1**. This demonstrates that with existing supplies and implementation of the projects discussed in the three agencies' planning documents there will be adequate water supplies to serve all anticipated growth (existing and future planned uses) and development.

TABLE 7-1
PROJECTED SUPPLY AND DEMAND COMPARISON – NORMAL YEAR
(AFY)

	2015	2020	2025	2030	2035
Supply totals	240,472	260,211	276,375	288,481	298,860
Demand totals	240,472	260,211	276,375	288,481	298,860
Difference (supply minus demand)	0	0	0	0	0

Table 7-2 provides a comparison of a single-dry year water supply with projected total water use over the next 25 years, in five-year increments.

TABLE 7-2
PROJECTED SINGLE-DRY YEAR SUPPLY AND DEMAND COMPARISON
(AFY)

	2015	2020	2025	2030	2035
Supply totals	255,040	276,526	293,895	307,230	318,586
Demand totals	255,040	276,526	293,895	307,230	318,586
Difference (supply minus demand)	0	0	0	0	0

The multiple-dry year scenarios, within a 20-year projection, are shown in **Table 7-3**. This demonstrates that supplies will be adequate to meet all anticipated growth (existing and future planned uses) and development in multiple-dry year periods.

TABLE 7-3
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE
DRY YEAR PERIOD ENDING IN 2035
(AFY)

		Supply and Demand Comparison – Multiple-dry Year Events				
		2015	2020	2025	2030	2035
Multiple-dry year First year supply	Supply totals	257,587	278,451	296,319	309,230	320,382
	Demand totals	257,587	278,451	296,319	309,230	320,382
	Difference	0	0	0	0	0
Multiple-dry year Second year supply	Supply totals	267,323	288,723	306,726	320,467	332,038
	Demand totals	267,323	288,723	306,726	320,467	332,038
	Difference	0	0	0	0	0
Multiple-dry year Third year supply	Supply totals	281,466	303,004	322,166	334,720	346,823
	Demand totals	281,466	303,004	322,166	334,720	346,823
	Difference	0	0	0	0	0

This Report demonstrates that there are sufficient water supplies over a 20-year planning horizon to meet the projected demands of the Project as well as the existing and other planned development projects within the Public Utilities Department service area in normal, dry year, and multiple-dry year forecasts. This Project is proposing water demands which are included in the regional water resource planning documents of the City, the Water Authority, and MWD.

Source Documents

California Department of Water Resources (DWR), Progress on Incorporating Climate Change into Management of California's Water Resources, July 2006 Report
California Climate Change Center, 2006 Biennial Report: Our Changing Climate: Assessing the Risks to California, 2006
California Department of Water Resources Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001, March 2011
DSD Memorandum - Request for assessment and project description, February 2013
MWD 2010 Regional Urban Water Management Plan
MWD Report on Metropolitan's Water Supplies, A Blueprint for Water Reliability, March 2003
MWD Integrated Resources Plan Update, Oct 2010
Public Utilities Department 2010 Urban Water Management Plan
Public Utilities Department Annual 2012 Water Conservation Report
Public Utilities Department Recycled Water Study July 2012
Public Utilities Department Recycled Water Master Plan August 2011
Public Utilities Department Water Purification Demonstration Project Report
Water Authority 2010 Urban Water Management Plan
Water Authority Regional Water Facilities Master Plan, 2003
Water Department Long-Range Water Resources Plan (2002-2030), December 2002
Water Department The City of San Diego Subordinated Water Revenue Bonds, Series 2002, October 2002



THE CITY OF SAN DIEGO

MEMORANDUM

DATE: March 23, 2015

TO: Myra Herrmann, Senior Planner, Development Services Department

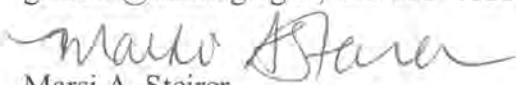
FROM: Marsi A. Steirer, Deputy Director, Long-Range Planning and Water Resources Division

SUBJECT: Addendum to Approved Encanto Community Plan's Water Supply Assessment Report for Inclusion of Additional Information on Accelerated Forecasted Growth

The City of San Diego (City) Development Services Department (DSD), as a lead agency, requested the Public Utilities Department (Department) prepare a Water Supply Assessment (WSA) for Encanto Community Plan Update project as part of the environmental review. The Department completed, approved and submitted the WSA to DSD on October 1, 2014. The project's WSA report was prepared in compliance with the requirements of Senate Bill (SB) 610 as codified in Water Code Section 10912(a) using the City's and San Diego County Water Authority's (Water Authority) 2010 Urban Water Management Plans (UWMP).

The water demands for the project (1,460 acre-feet per year) are accounted for in the Water Authority's 2010 UWMP under the Accelerated Forecasted Growth (AFG) demand increment. An approval letter from the Water Authority granting the AFG demand for the project is shown in Attachment A. The Water Authority's accounting of the AFG demands is adjusted to reflect the additional water demands associated with each member agency AFG request after the Department approves the WSA. All requests to date that have been received and granted by the Water Authority are shown in Attachment B.

Should you have any questions, please feel free to contact George Adrian at gadrian@sandiego.gov, 619-533-4680 or Seevani Bista at sbista@sandiego.gov, 619-533-4222.


Marsi A. Steirer
Deputy Director

Sb/sb

Attachments: A- Approval Email from Water Authority
B - Water Authority's Accelerated Forecasted Growth Demands that have been Received and Granted

ATTACHMENT A

Approval Email From Water Authority

Subject: FW: AFG request to SDCWA
Attachments: Ball Park-Proj Descrip.pdf; Encanto CPU- Project Descrip.pdf; AFG 2010 UWMP -Summary2 (3).pdf

Importance: High

From: Frieauf, Dana [<mailto:DFrieauf@sdewa.org>]
Sent: Monday, October 06, 2014 6:40 PM
To: Steirer, Marsi
Cc: Adrian, George; Bista, Seevani; Kaziha, Anas; Bombardier, Tim
Subject: AFG request to SDCWA
Importance: High

Marsi,

Thank you for your email regarding the Encanto Community Plan Update and revised Ballpark Village Parcel C Residences. Ken is out of the office this week and requested that I respond to your email. The following is the Water Authority's response to your request to use the Accelerated Forecasted Growth (AFG) component of the Water Authority's 2010 Urban Water Management Plan to meet the unanticipated water demands associated with the proposed plan update and project.

The purpose of the AFG component of the demand forecast is to estimate, on a regional basis, additional demand associated with proposed projects not yet included in local jurisdictions' general plans and to plan for sufficient regional supplies to reliably meet the water demand of those projects. The Encanto Community Plan Update and revised Ballpark Village Parcel C Residences identified in your e-mail, meets the criteria for the AFG component of the Water Authority's 2010 UWMP and we are planning to have water supplies to reliably meet the demand associated with the plan update and project. Our accounting of the AFG demand component will be adjusted to reflect the additional demand associated with the proposed plan update and project.

Please let me know if you have any questions or want to discuss further.

Regards,

Dana

Dana Frieauf

Acting Water Resources Manager
San Diego County Water Authority
dfrieauf@sdewa.org
858-522-6749 (work)

From: Steirer, Marsi [<mailto:MSteirer@sandiego.gov>]
Sent: Thursday, September 25, 2014 2:22 PM
To: Weinberg, Ken; Frieauf, Dana; Bombardier, Tim
Cc: Bista, Seevani; Steirer, Marsi; Adrian, George; Kaziha, Anas
Subject: AFG request to SDCWA
Importance: High

Dear Ken,

The City of San Diego is preparing two water supply assessments; the Encanto Community Plan Update and the Ballpark Village Parcel C Residences in accordance with the requirements of SB 610. Please find attached two documents with descriptions of each project. As some of the proposed development for these projects were not accounted for in the SANDAG Series 12 forecast, the water demands associated with the unaccounted growth were also not included in the City's 2010 Urban Water Management Plan. The unaccounted water demand associated with these projects are as seen in the table below:

Project	Water Demands (Acre Feet per Year)		
	Planned	Projected	Delta
Encanto Community Plan update	5,504.0 AFY	6,963.0 AFY	- 1,460.0
	Portion of the Project Not Accounted for in the SANDAG's Series 12 forecast		- 1,460.0
Ballpark Village Parcel C Residences Project	0 AFY	170.9 AFY	- 170.9
	Portion of the Project Not Accounted for in the SANDAG's Series 12 forecast		- 170.9

The City is requesting the use of the Accelerated Forecasted Growth (AFG) component of the Water Authority's 2010 Urban Water Management Plan to meet the unanticipated water demands associated with these projects, similar to the other projects requested.

Attached is a table showing the total AFG that the City has requested to date.

Your prompt assistance with this request will be greatly appreciated.

Thank you,

Marsi

Marsi A. Steirer
Deputy Director, Long-Range Planning and Water Resources
Public Utilities Department
(o) 619.533.4112 (m) 619.865.7458

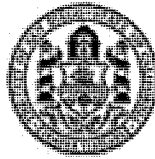
ATTACHMENT B

**Water Authority's Accelerated Forecasted Growth Demands
that have been Received and Granted**

2010 UWMP Accelerated Forecast Growth

			Running Total (AF)	Date Certified EIR Received
Response Date	Agency	Project	Estimated (AF)	
8/24/2011	City of San Diego	San Diego Corporate Center	147	
8/24/2011	City of San Diego	Metropolitan Airpark/Brown Field	38	
8/24/2011	City of San Diego	Barrio Logan Community Plan	272	
8/24/2011	City of San Diego	Otay Mesa Community Plan	170	
8/24/2011	City of San Diego	15th and Island	85	4/24/12 (Approved by CC)
9/26/2011	City of San Diego	Convention Center Expansion	109	821 9/19/12 (Approved by Port District)
1/31/2012	City of San Diego	WaterMark	9	830
4/11/2012	City of San Diego	11th & Broadway Mixed-Use Project	29	859 12/4/12 (Phase 1 approved) Phase 2
2/13/2013	City of San Diego	Liberty Station East Hotel	94	953 6/4/13 (Approved by CC)
4/2/2013	City of San Diego	Cisterra Tower Development	63	1,016
4/2/2013	City of San Diego	Kaiser Permanente Hospital	227	1,243
5/29/2013	Otay Water District	Otay Ranch Planning Area 12	127	1,370
7/9/2013	Otay Water District	Villages 3, 8east, and 10	41	1,411
8/13/2013	Otay Water District	Village 2 (SPA Amendment)	529	1,940
2/28/2013	City of San Diego	Chollas Triangle Development	14.7	1,955
6/5/2014	City of San Diego	Glen at Scripps Ranch	88	2,043
10/1/2014	City of San Diego	Encanto Community Plan Update	1460	3,503
10/6/2014	City of San Diego	Ballpark Village Parcel C Reisdences	170	3,673
12/8/2014	City of San Diego	Merge 56 Development	72	3,745
			Running Total	3,745
Total City Usage			3,048	

Note: Data as of March 20, 2015



THE CITY OF SAN DIEGO

M E M O R A N D U M

DATE: October 7, 2014

TO: Cathy Winterrowd, Deputy Director, Planning Department

FROM: Seevani Bista, Senior Water Resources Specialist, Public Utilities Department

SUBJECT: Water Supply Assessment (WSA) Report – Encanto Community Plan Updates
(Internal Order No. FF1000347-12)

In response to your request, please find attached WSA for Encanto Community Plan Update approved by Deputy Director of the Long-Range Planning and Water Resources Division, Public Utilities.

The Public Utilities Department (Department) prepared this WSA to assess whether sufficient water supplies are or will be available to meet the projected water demands of the project. The findings verify that there is sufficient water supply to serve existing demands, projected demands of the project, and future water demands within the Water Department's service area in normal and dry year forecasts during a 20-year projection.

Should there be any comments on the WSA at the conclusion of the public review process of the EIR, please forward them for our review and comments for our review. Please provide us a copy of the EIR after the City Council approval.

If you have any questions, please call Seevani Bista at (619) 533-4222.

Seevani Bista

AK/tm

Attachment: Water Supply Assessment Report

cc: Ray Palmucci, Deputy City Attorney, Office of the City Attorney
Myra Herrmann, Senior Planner, Development Services Department
Marsi A. Steirer, Deputy Director, Public Utilities Department
George Adrian, Principal Water Resources Specialist
Anas Kaziha, Junior Engineer-Civil, Public Utilities Department
RMS 6.8.4



WATER SUPPLY ASSESSMENT REPORT

Encanto Community Plan Update

Prepared by:

City of San Diego Public Utilities Department

Reviewed by:

Marsi A. Steirer, Deputy Director **Date**
Long-Range Planning & Water Resources Division

Prepared: September 2014

11

**City of San Diego Public Utilities Department
Water Supply Assessment Report**

Encanto Community Plan Update

Table of Contents

Section 1 - Purpose.....	1
Section 2 - Project Description.....	2
Section 3 - Findings.....	4
Section 4 - City of San Diego Public Utilities Department.....	7
4.1 Overview of Potable System Facilities	7
4.2 Overview of Recycled System Facilities	8
Section 5 - Existing and Projected Supplies.....	10
5.1 Metropolitan Water District of Southern California	11
5.2 San Diego County Water Authority	13
5.3 2009 Comprehensive Water Package.....	15
5.4 Public Utilities Department.....	16
5.4.1 Demonstrating the Availability of Sufficient Supplies	16
5.4.2 Plans for Acquiring Additional Supplies	22
Section 6 - Projected Demands	28
6.1 Water Sales to Other Agencies.....	32
6.2 Projected Single-dry Year Water Supply and Demand.....	35
6.3 Projected Multiple-dry Year Water Supply and Demand	35
Section 7 - Conclusion - Availability of Sufficient Supplies	37
Source Documents.....	39

Section 1 - Purpose

On January 1, 2002, Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) took effect. The intent of SB 610 and SB 221 was to improve the link between information on water supply availability and certain land-use decisions made by cities and counties. Under SB 610 (codified in the Water Code beginning at Section 10910), a water supply assessment (WSA) must be furnished to cities and counties for inclusion in any environmental documentation of projects (defined in the Water Code) that propose to construct 500 or more residential units, or that will use an amount of water equivalent to what would be used by 500 residential units, and are subject to the California Environmental Quality Act (CEQA). Under SB 221, approval by a city or county of certain residential subdivisions requires an affirmative written verification of sufficient water supply or water supply verification (WSV).

Not every project that is subject to the requirements of SB 610 is also subject to the mandatory water verification of SB 221 (e.g., if subdivision map approval is not required). Conversely, not every project that is subject to the requirements of SB 221 must also obtain a SB 610 water supply assessment.

A foundational document for compliance for both SB 610 and SB 221 is the Urban Water Management Plan (UWMP) of the relevant water agency. Both of these statutes repeatedly identify the UWMP as a planning document that can be used by a water supplier to meet the standards set forth in both statutes. Thorough and complete UWMPs will allow water suppliers to use UWMPs as a foundation to fulfill the specific requirements of the two statutes. Cities, counties, water districts, property owners and developers utilize this document when planning for and proposing new projects. It is crucial that cities, counties and water suppliers work closely when developing and updating these planning documents. The City of San Diego's 2010 UWMP, which is used as the basis for this Report (WSA), was adopted by the San Diego City Council in June 2011.

The City of San Diego (City) Development Services Department (DSD) requested the Public Utilities Department (Department) prepare this WSA as part of the environmental review for the Encanto Community Plan Update (Planned Update). A more detailed description of the Project is provided in Section 2 of this WSA. This WSA evaluates water supplies that are or will be available during normal, single-dry year, and multiple-dry water years during a 20-year projection to meet the projected demands of the Project, in addition to existing and planned future water demands of the Department. This WSA provides an assessment of the availability of sufficient water supplies for the Project only, and does not constitute approval of the Project.

This WSA also includes identification of existing water supply entitlements, water rights, water service contracts, or agreements relevant to the identified water supply for the Project and quantities of water received in prior years pursuant to those entitlements, rights, contracts and agreements.

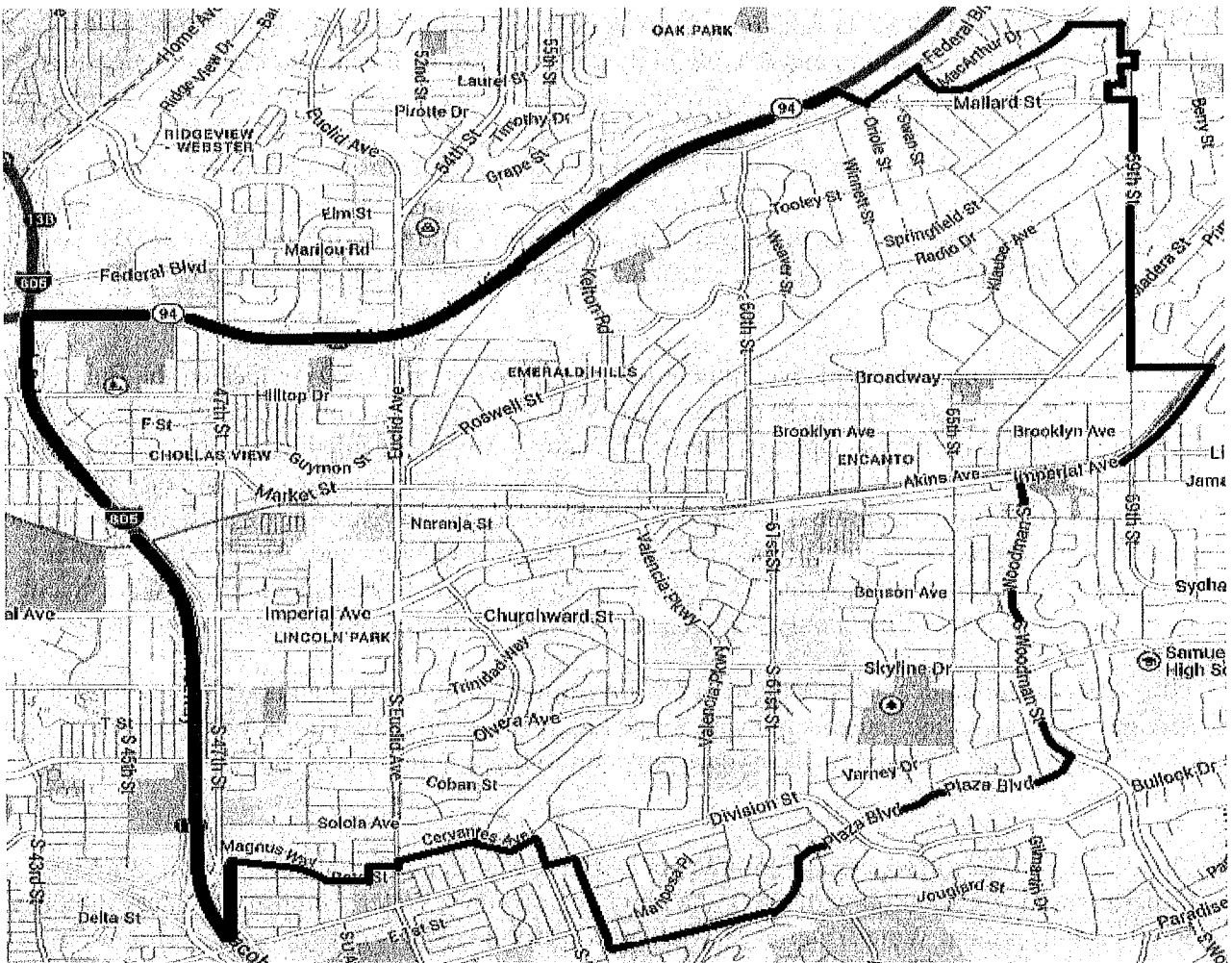
This Report has been prepared in compliance with the requirements under SB 610 by the Department in consultation with DSD, the San Diego County Water Authority (Water Authority) and the Metropolitan Water District of Southern California (MWD).

Section 2 - Project Description

The Planned Update is located approximately five miles east of Downtown and encompasses approximately 3,810 acres. The Planned Update is bounded by State Route 94 to the north and Interstate 805 to the west, providing access to local and regional destinations. The Southeastern San Diego Community Planning Area is immediately to the west of the Planned Update. The City of Lemon Grove defines the northeast boundary of the Planned Update roughly along 69th Street, while the City of National City defines the western half of the Planned Update southern boundary. Plaza Boulevard marks the southern boundary to the east. Specific neighborhoods in the community include Chollas View, Lincon Park, Valencia Park, O'Farrell, Alta Vista, Encanto, and Broadway Heights.

The Planned Update site map is shown in Figure 2-1

**FIGURE 2-
VICINITY MAP OF THE PROJECT**



The existing community is dominated by single-family residential neighborhoods, with a band of higher density residential neighborhoods in the Imperial Avenue corridor. Neighborhoods west of Euclid Avenue are somewhat older and characterized by gridded streets and a mixture of land uses. Neighborhoods to the east are interspersed with hillside and canyons and feature larger lots. Commercial development is located along the Imperial Avenue, Market Street, and Euclid Avenue corridors, with a small amount of light industrial development along portions of Market Street. The area around Market Street and Euclid Avenue has the potential to grow as the community's mixed-use core.

Table 2-1 shows potential development resulting from application of land uses and underutilized sites. This includes development already permitted but not yet built. As shown in the tables, the existing inventory of 13,143 housing units could increase by 8,398 (64 percent) to a total of 21,541. Commercial and industrial development is projected to increase by 171 percent and 42 percent respectively, while the amount of office space would decline.

Table 2-1
PROPOSED AND EXISTING DEVELOPMENT

Development Type	Planned	Existing	Proposed
<i>Residential (dwelling units)</i>			
Single-Family Residential	9,624	10,666	9,942
Multi-Family Residential	6,294	2,477	11,599
Total Residential	15,918	13,143	21,541
Employees	5,756		Employees calculated in Table 3-1
<i>Non-Residential (square feet)</i>			
Commercial	Calculated in Employees value above	439,000	1,188,400
Office		190,800	135,000
Industrial and Utilities		467,000	661,000
Community Facility		2,017,100	2,001,000
Total Non-Residential		3,114,000	3,985,300

1. Single-family residential includes detached single-family and multiple unit single family. Multifamily Residential includes mobile homes as part of mixed-use.
2. Non-residential development rounded to nearest 100 square feet.

Section 3 - Findings

Water Assessment

Project: This Report identifies that the water demand projections for the Project, are included in the regional water resource planning documents of MWD, the Water Authority and partially the City. Current and future water supplies, as well as actions necessary to develop the future water supplies, have been identified. This Report demonstrates that there will be sufficient water supplies available during normal, single-dry year, and multiple-dry water years during a 20-year projection to meet the unanticipated projected demands of the Project. This is done by utilizing the demand increment associated with the accelerated forecasted growth in the Water Authority's 2010 UWMP as described below, and in the City's 2010 UWMP.

The Water Authority's 2010 UWMP provides for a comprehensive planning analysis at a regional level, and includes water use associated with accelerated forecasted residential development as part of its municipal and industrial sector demand projections. These housing units were identified by the San Diego Association of Government (SANDAG) land use plan in the course of its regional housing needs assessment, but are not yet included in existing general land use plans of local jurisdictions. The demand associated with accelerated forecasted residential development is intended to account for SANDAG's land-use development currently projected to occur between 2035 and 2050, but has the likely potential to occur on an accelerated schedule. SANDAG estimates that this accelerated forecasted residential development could occur within the planning horizon (2010 to 2035) of the 2010 UWMP. These units are not yet included in local jurisdictions' general plans, so their projected demands are incorporated at a regional level. When necessary, this additional demand increment, termed Accelerated Forecasted Growth, can be used by member agencies to meet the demands of development projects not identified in the general land use plans.

As demonstrated in Table 3-1 of this Report, prepared by the Department in compliance with the requirements of SB 610 using the City's and Water Authority's 2010 UWMP based upon SANDAG Series 12 Forecast land use, there is sufficient water planned to supply the Project's estimated annual average usage. The projected water demands of the Project are 6,217,203 gallons per day (gpd) or 6,963 acre-feet per year (AFY). Per the City's 2010 UWMP, the planned water demands of this project site are 4,913,894 gpd or 5,504 AFY. The remaining portion of the estimated 1,157,933 gpd or 1,460 AFY is accounted for through the Accelerated Forecasted Growth demand increment of the Water Authority's 2010 UWMP. As documented in the Water Authority's 2010 UWMP, the Water Authority is planning to meet future and existing demands which include the demand increment associated with the accelerated forecasted growth. The Water Authority will also assist its member agencies in tracking the certified Environmental Impact Reports (EIRs) provided by the agencies that include water supply assessments that utilize the accelerated forecasted growth demand increment, to demonstrate adequate supplies for the development. In addition, the next update of the demand forecast for the Water Authority's 2015 UWMP will be based on SANDAG's most recently updated forecast, which will include the Project.

Existing and Future Developments Planned to occur by 2035: The City's 2010 UWMP demonstrates there will be sufficient water supplies available to meet demands for existing and

planned future developments that are projected to occur by 2035. Based on a normal water supply year, the estimated water supply projected in five-year increments for a 20-year projection will meet the City's projected water demand of 240,472 AF^B (AF) in 2015 to 298,860 AF in 2035 (Table 6-5) for these developments. Similarly, based on a single-dry year forecast (Table 6-7), the estimated water supply will meet the projected water demand of 318,586 AF (2035). Based on a multiple-dry year, third year supply (Table 6-8), the estimated water supply will meet the projected demands of 281,466 AF (2015); 303,004 AF (2020); 322,166 AF (2025); 334,720 AF (2030); and 346,823 AF (2035).

**TABLE 3-1
WATER DEMAND ANALYSIS**

Planned Water Demands for the Project Site included in the 2010 UWMP				
Category		Quantity	Estimated Potable Water Use in Gallons per Day (GPD) Acre-Feet per Year (AFY)	
2035				
Single-family Units ¹		9,624	3,460,790	3,876
Multi-family Units ²		6,294	1,107,744	1,241
Employees		5,756	345,360	387
Total			4,913,894	5,504
Projected Water Demands for Encanto Community Plan Update				
	Quantity		GPD	AFY
Single-family Units ¹		9,942	3,575,143	4,004
Multi-family Units ²		11,599	2,041,424	2,286
Non-Residential	sq. ft	Employee		
Commercial ^{3,4}	1,188,420	2,377	142,610	160
Office ^{3,5}	134,950	491	29,444	33
Industrial and Utilities ^{3,6}	660,999	1,102	66,100	74
Community Facilities ⁷	2,000,976		362,482	406
Total			6,217,203	6,963
Net Water Demands				
Projected			6,963	AFY
City of San Diego 2010 UWMP - Planned			5,504	AFY
Planned from Water Authority's Accelerated Forecasted Growth			1,460	AFY
Unanticipated Demand			0	AFY

^B An acre-foot of water equals 325,851 gallons, which is enough water for two average families of four for one year.

Table 3-1 Notes:

1. 116 gpcd in the City's acceptable standard for single-family water consumption (Includes landscaping water demand). The person per household (residential) is estimated at 3.1 based on City wide average (SANDAG).
2. 80 gpcd is the City's acceptable standard for multi-family water consumption (Includes landscaping water demands). The person per household (residential) is estimated at 2.2 based on City wide average (SANDAG).
3. The utilization of 60 gallons per person per day is the City's acceptable standard for employment water use (Includes nominal landscaping water demand).
4. Number of retail employees estimated at 500 sq ft per employee (City Data)
5. Number of office employees estimated at 275 sq ft per employee (City Data)
6. Number of Industrial employees estimated at 600 sq ft per employee (City Data)
7. Number of Community Facilities (Schools and Parks) estimated at 7,891 Gallons/acre/day (AWWA Research Foundation)

Conclusion

In summary, these findings substantiate that there is sufficient water supply planned to serve this Project's future water demands within the Department's service area in normal, single-dry year, and multiple-dry water year forecasts.

Therefore, this Report concludes that the projected level of water use for this Project is within the regional water resource planning documents of the City, the Water Authority and MWD. Current and future water supplies, as well as the actions necessary to develop these supplies, have been identified in the water resources planning documents of the Department, the Water Authority, and MWD to serve the projected demands of the Project, in addition to existing and planned future water demands of the Department.

Section 4 - City of San Diego Public Utilities Department

The City purchased its initial water system in 1901 from the privately owned San Diego Water & Telephone Company. Since then, continual expansion of the water system has been required to meet the demands of the growing population of the City. To meet the demand, the Department purchased a number of reservoirs between 1913 and 1935 to supplement local water supplies. Despite low annual precipitation in the area (approximately 10 inches per year), these reservoirs supplied the City's growing demands until 1940.

The need to import water emerged with the increased demand generated by the presence of the United States Navy prior to and during World War II, and the ensuing population growth. As a result, the Department and other local retail water distributors formed the Water Authority in 1944 for the purpose of purchasing Colorado River water from MWD. The Department and other local retail water distributors began receiving imported water from the Colorado River in 1947.

Today, the Department treats and delivers more than 200,000 AFY of water to more than 1.3 million residents. The water system extends over 404 square miles, including 342 square miles in the City. The Department potable water system serves the City and certain surrounding areas, including both retail and wholesale customers. The Project is located within the Department service area.

In addition to delivering potable water, the City has a recycled water program. Its objectives are to optimize the use of local water supplies, lessen reliance on imported water and free up capacity in the potable system. Recycled water provides the City a dependable, year-round, locally produced and controlled water resource.

4.1 Overview of Potable System Facilities

The water system consists of nine raw water storage facilities with over 408,000 AF of storage capacity, three water treatment plants, 28 treated water storage facilities, and more than 3,212 miles of transmission and distribution lines.

The Department maintains and operates nine local surface raw water storage facilities, which are connected directly or indirectly to the City's water treatment operations. The Lower Otay, Barrett, and Morena Reservoirs (135,349 AF total capacity) service the Otay Water Treatment Plant in south San Diego; the El Capitan, San Vicente, Sutherland, and Lake Murray Reservoirs (236,311 AF total capacity) service the Alvarado Water Treatment Plant in central San Diego; and the Miramar Reservoir (6,682 AF total capacity) services the Miramar Water Treatment Plant in north San Diego. Lake Hodges Reservoir has a total capacity of 30,251 AF and is connected to Olivenhain Reservoir, which is owned by Water Authority. Olivenhain Reservoir is connected to the Water Authority's second aqueduct. Through this connection, Hodges water can be delivered to all City treatment plants. The City has the ability to access 50 percent of the local water available in Hodges Reservoir via the Water Authority's delivery system.

The Department maintains and operates three water treatment plants with a combined total rated capacity of 423,860 AFY (378.4 million gallons per day MGD). The Miramar Water Treatment

Plant (Miramar WTP), originally constructed in 1962, has a rated capacity of 161,300 AFY (144 MGD) with the ability to increase to 240,830 AFY (215 MGD) after the replacement of the two old clearwells in 2016. The Miramar WTP generally serves the City's geographical area north of the San Diego River (north San Diego). The Alvarado Water Treatment Plant (Alvarado WTP), operational since 1951, had an initial capacity rating of 134,417 AFY (120 MGD). Several hydraulic improvements and upgrades were completed in 2011 which increased the capacity of the plant to 224,028 AFY (200 MGD). The California Department of Public Health (CDPH) has approved this rating for the Alvarado WTP. The Alvarado WTP generally serves the geographical area from National City to the San Diego River (central San Diego). The Otay Water Treatment Plant (Otay WTP) was constructed in 1940, and has a current rated capacity of 38,533 AFY (34.4 MGD), which meets current and short-term forecasted demands. The Otay WTP has hydraulic capacity to increase to 44,806 AFY (40 MGD) in the future. In order to do so, approval from CDPH is required, based upon a future high filtration rate study. The Otay WTP generally serves the geographical area bordering Mexico (south San Diego) and parts of the southeastern portion of central San Diego. All upgrade work was completed in 2012 including the construction of a third flocculation and sedimentation basin, filter piping and media improvements.

The Department maintains and operates 28 treated water storage facilities including steel tanks, standpipes, concrete tanks and rectangular concrete reservoirs, with capacities varying from less than one to 35 million gallons.

The water system consists of more than 3,212 miles of pipelines, including transmission lines up to 84 inches in diameter and distribution lines as small as four inches in diameter. Transmission lines are pipelines 16 inches and larger in diameter that convey raw water to the water treatment plants and convey treated water from the water treatment plants to the treated water storage facilities. Distribution lines are pipelines 16 inches and smaller in diameter that directly services the retail users connected to a meter. In addition, the Department maintains and operates 49 water pump stations that deliver treated water from the water treatment plants to approximately 279,557 metered service connections in 128 different pressure zones. The Department also maintains several emergency connections to and from neighboring water agencies, including the Santa Fe Irrigation District (Miramar WTP), the City of Poway (Miramar WTP), Olivenhain Municipal Water District (Miramar WTP), the Cal-American Water Company (Alvarado and Otay WTP), Sweetwater Authority (Otay WTP), and the Otay Water District (Otay WTP).

4.2 Overview of Recycled System Facilities

The City's recycled water system consists primarily of two water reclamation plants with a combined total wastewater treatment capacity of 50,406 AFY (45 MGD), three recycled water storage facilities with over 12 million gallons (12 MG) of storage capacity, and more than 94 miles of transmission and distribution lines.

Located in the Miramar area, the North City Water Reclamation (NCWRP) treats an average of 18,482 AFY (16.5 MGD) of wastewater, although the plant has an ultimate treatment capability of 33,604 AFY (30 MGD). In Fiscal Year (FY) 2014, 8,417 AFY (7.5 MGD) was beneficially reused. The Department maintains and operates the Northern Service Area distribution system

which consists of 91 miles of recycled water pipeline, two reservoirs, two pump stations, with service to 574 meters.

Located at the end of Dairymart Road, near the International Border with Mexico, the South Bay Water Reclamation Plant (SBWRP) treats an average of eight (8) MGD of wastewater, although the Plant has a treatment capability of 16,802 AFY (15 MGD). In FY 2014, an average of 4,804 AFY (4.3 MGD) was beneficially reused. The Department maintains and operates the Southern Service Area distribution system which consists of three miles recycled water pipeline, one storage tank, one pump station and seven meters.

Section 5 - Existing and Projected Supplies

The Department relies on imported water as its major water supply source, and is a Water Authority member agency. The Water Authority is a member agency of MWD. The statutory relationships between the Water Authority, MWD and its member agencies, respectively, establish the scope of the Department's entitlements to water from these two agencies. Due to the Department's reliance on these two agencies, this Report relies and includes information on the existing and projected supplies, supply programs, and related projects of the Water Authority and MWD.

The City relies on the long-term water resources planning documents of the Water Authority and MWD to support the work on this Report. These documents are available at the following websites and contacts:

San Diego County Water Authority

<http://www.sdcwa.org/2010-urban-water-management-plan>

Dana Frichauf, Principal Water Resources Specialist (858) 522-6749

Metropolitan Water District of Southern California

<http://www.mwdh2o.com/mwdh2o/pages/yourwater/ywater01.html#RUWMP>

MWD staff, (213) 217-6000

The Water Authority and MWD are actively pursuing programs and projects to diversify their water supply resources. A description of these efforts as well as the challenges facing the Water Authority and MWD can be found in the San Diego County Water Authority Official Statement, dated February 13, 2013, relating to Water Revenue Refunding Bonds 2013A, and MWD's Official Statement, dated March 13, 2014, relating to Water Revenue Refunding Bonds, 2014 Series A. These Official Statements are available at the following websites:

<http://www.sdcwa.org/sites/default/files/files/finance-investor/2013Bond.pdf>

<http://mwdh2o.com/mwdh2o/pages/finance/PDFs/2014-Ser.A-B-FOS.pdf>

A brief overview of MWD and the Water Authority, including the Department relationship to these agencies, is included below.

A description of local surface and local recycled water supplies available to the Department can be found in Section 5.4 of this Report.

This information is current at the time this document was prepared.

5.1 Metropolitan Water District of Southern California

Metropolitan Water District (MWD) was created in 1928, under the authority of the Metropolitan Water District Act (California Statutes 1927, Chapter 429, as reenacted in 1969 as Chapter 209, as amended) (the “MWD Act”). MWD’s primary purpose is to provide a supplemental supply of wholesale water for domestic and municipal uses to its constituent agencies. The MWD service area comprises approximately 5,200 square miles and includes portions of the six counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura. There are 26 member agencies of MWD, consisting of 14 cities, 11 municipal water districts and the San Diego County Water Authority (Water Authority). A Board of Directors, currently numbering 37 members, governs MWD. Each constituent agency has at least one representative on the MWD Board. Representation and voting rights are based upon the assessed valuation of property within each constituent agency. The Water Authority has four members on the MWD Board and about 17 percent of the weighted vote. The total population of the MWD service area is currently estimated at approximately 19 million.

MWD’s existing water supplies have been historically sufficient to meet demands within its service area during years of normal precipitation. Although MWD plans and manages reserve supplies to account for normal occurrences of drought conditions, regulatory actions, including, but not limited to, restrictions under the Federal and California Endangered Species Acts, have at times placed limitations on MWD’s ability to provide water to its member agencies. In the future, population growth, regulatory restrictions, increased competition for low-cost water supplies, and other factors such as climate change could impact MWD’s ability to supply its member agencies even in normal years.

MWD Water Supply

MWD’s two major sources of water are from the Colorado River and the State Water Project (SWP).

Colorado River Water: The Colorado River was MWD’s original source of water after its establishment in 1928. The MWD owned and operated Colorado River Aqueduct, is 242 miles long, starting at Lake Havasu and terminating at Lake Mathews in Riverside County.

Under numerous compacts, federal laws, court decisions and decrees, contracts, and regulatory guidelines collectively known as the “Law of the River” that govern the use of water from the Colorado River, California is entitled to 4.4 million acre-feet of Colorado River water annually. Additionally, California is entitled to one-half of any surplus water that may be available for shared use with Arizona and Nevada as determined on an annual basis by the United States Secretary of the Interior. Under the priority system that governs the distribution of Colorado River water made available to California, MWD holds the fourth priority right of 550,000 acre-feet per year and a fifth priority right of 662,000 acre-feet per year. MWD’s fourth priority right is within California’s basic annual apportionment of 4.4 million acre-feet; however, the fifth priority right is outside of this entitlement and therefore is not considered a firm supply of water. MWD also retains a “call” on 100,000 acre-feet per year on water transferred to the Coachella Valley Water

District and the Desert Water Agency, if needed, so long as they pay for the financial obligations associated with the water during the call period.

A study released in July 2014 by NASA and the University of California, Irvine found that the Colorado River basin had lost more than 75 percent of its water between late 2004 and early 2013. The overall loss was nearly 53 million acre-feet, which included a 41 million acre-feet loss of groundwater. Researchers are uncertain as to how much water is left in the groundwater basin

Several fish and other wildlife species either directly or indirectly have the potential to affect Colorado River operations, thus changing the amount of water deliveries to the Colorado River Aqueduct. A number of species that are on either “endangered” or “threatened” lists under the federal and/or California endangered species acts (“ESAs”) are present in the area of the Lower Colorado River. MWD and other stakeholder agencies have developed a multi-species conservation program that allows MWD to obtain federal and state permits for any incidental take of protected species, resulting from current and future water and power operations of its Colorado River facilities and to minimize any uncertainty from additional listings of endangered species.

State Water Project: The State Water Projects (SWP) is owned by the State of California and operated by the State Department of Water Resources (DWR). The SWP’s source waters originate in Northern California with water captured from the Feather River Watershed behind Lake Oroville Dam. The Oroville Dam releases water into the Feather River which is tributary to the Sacramento River, where it combines with other drainages from the western Sierras in the Sacramento-San Joaquin River Delta east of the San Francisco Bay Estuary. MWD receives water pumped from the Harvey O. Banks Pumping Plant in the southern portion of the Sacramento-San Joaquin River Delta, via the 444 mile-long California Aqueduct, to four delivery points near the northern and eastern boundaries of MWD. MWD is one of 29 agencies that have long-term contracts for water service from DWR, and is the largest agency in terms of the number of population served, the share of SWP water to which it is entitled, and the total amount of annual payments made to DWR. MWD’s contract with DWR provides for the ultimate delivery of 1,911,400 acre-feet per year (46 percent of the total SWP entitlement). The SWP was originally intended to meet demands of 4.2 million acre-feet per year. Initial SWP facilities were completed in the early 1970s, and it was envisioned that additional facilities would be constructed as contractor demands increased. Several factors, including public opposition, increased costs, and increased non-SWP demands for limited water supplies, combined to delay the construction of additional facilities.

The quantity of SWP water available for delivery each year is controlled by hydrology, environmental and operational considerations. In addition to its importance to urban and agricultural water users, the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) is of critical ecological importance. The Bay-Delta is the largest estuary on the west coast of the United States and provides habitat for more than 750 plant and animal species. One-hundred-fifty years of human activity have contributed to the destruction of habitat, the decline of several estuarine and anadromous fish species, and the deterioration of water quality. These activities include increasing water demands from urban and agricultural uses, the dredging and filling of tidal marshes, the construction of levees, urban runoff, agricultural drainage, runoff from

abandoned mines, and the introduction of non-native species, thus affecting the supply and reliability of this source.

DWR has altered the operations of the SWP to accommodate species of fish listed under the ESAs. These changes in project operations have adversely affected SWP deliveries. The impact on total SWP operations attributable to the ESA listed Delta smelt and salmon species biological opinions combined is estimated to be one million acre-feet in an average year, reducing SWP deliveries from approximately 3.3 million acre-feet to approximately 2.3 million acre-feet for the year under average hydrology, and are estimated to range from 0.3 million acre-feet during critically dry years to 1.3 million acre-feet in above normal water years. SWP deliveries to contractors for calendar years 2008 through 2012 were reduced by a total of approximately 2.3 million acre-feet as a result of pumping restrictions. Based upon the latest verified information, pumping restrictions that are impacting the SWP allocations for 2013 have reduced exports by approximately 596,000 acre-feet through calendar year 2013.^C

As a result of California experiencing the third year of drought and the driest year on record, the DWR announced a zero percent initial allocation of requested SWP requests for 2014. Due to the late winter storms the state has experienced, that initial allocation was raised to 5 percent in April 2014.^D

5.2 San Diego County Water Authority

The Water Authority service area lies within the foothill and coastal areas of the westerly third of San Diego County, encompassing 952,208 acres (1,488 square miles). When the Water Authority was established in 1944, its service area consisted of 94,707 acres. Of the total population of San Diego County, 97 percent live within the Water Authority's service area. Growth has primarily resulted from the addition and annexation of service areas by member agencies. The City, with a population of 1.3 million served and a service area of 210,726 acres is by far the Water Authority's largest member agency and customer.

The Water Authority's service area is a semi-arid region where the natural occurrence of water from rainfall and groundwater provides a firm water supply for only a small portion of the water demands of the current population. Since 1990, the Water Authority has provided an average of 85 percent of the water supply within its service area. As a wholesaling entity, the Water Authority has no retail customers, and only serves its member agencies.

The Water Authority's mission is to provide its member agencies with a safe and reliable water supply. Historically, the principal source of supply for the Water Authority's service area has been water purchased from MWD for sale to the Water Authority's member agencies. However, drought conditions and population growth in the Water Authority's service area have highlighted the need for diversification of the region's water supplies. Consistent with its mission statement, the Water Authority has actively pursued a strategy of supply diversification that includes the

^C <http://mwdh2o.com/mwdh2o/pages/finance/PDFs/2014-Ser.A-B-FOS.pdf>

^D <http://www.water.ca.gov/waterconditions/>

acquisition and importation of additional water supplies, the development of additional local water supply projects and augmentation of its water supply via local and regional water storage capacity. Water supplies utilized within the Water Authority service area originate from two sources: (1) water imported by the Water Authority and (2) local supplies (such as local runoff, groundwater, recycled water, and prospectively seawater desalination). Since 1990, local supplies have grown to constitute 15 percent of the Water Authority's water supply, and the Water Authority has implemented programs and supported new technologies in order to assist its member agencies in increasing this percentage. Although MWD remains the Water Authority's largest source of imported water, recent years have also seen the diversification of sources of imported water through core and spot water transfers with other agencies.

In late November 2012, the Water Authority's Board of Directors approved a 30-year Water Purchase Agreement with Poseidon Resources, a private investor-owned company, to purchase water from the proposed Carlsbad Desalination Plant, which is a fully-permitted ocean desalination plant and conveyance pipeline. The plant will produce 50 million gallons a day starting in 2016. By 2020, it will generate enough water to meet seven 7 percent of the region's current demands^E. January 8, 2014 marks one year of construction putting the project a little more than 25 percent complete. The project is scheduled to be online by early 2016, though deliveries could begin as soon as the fall of 2015. As of May 29, 2014, the 10-mile pipeline that will connect the Carlsbad Desalination Plant to the Water Authority's distribution system is 50 percent complete.

The Quantification Settlement Agreement (QSA) for the Colorado River was completed in October 2003. This historic agreement was enacted to help settle disputes regarding the persistent over-drafting of the state's 4.4 million acre-foot basic annual apportionment of Colorado River water. The agreement includes a long-term transfer of conserved water from the Imperial Irrigation District to the Water Authority. The QSA also commits the state to a restoration path for the environmentally sensitive Salton Sea and provides full mitigation for these water supply programs. Specific programs under the QSA that directly benefit the Water Authority include the San Diego County Water Authority-Imperial Irrigation District water transfer agreement, which currently transfers 100,000 acre-feet of high priority Colorado River water to the Water Authority and will provide up to 200,000 acre-feet of water a year through water conservation measures in Imperial Valley in 2021. The QSA also allows for the transfer of water from the Imperial Irrigation District (IID), for water conserved through the implementation of the Water Authority performed projects to install concrete linings on portions of the previously earthen All-American and Coachella Canals. The canal lining projects reduced the losses of water that historically occurred through seepage. MWD assigned to the Water Authority its right to develop approximately 77,700 acre-feet of conserved Colorado River water annually.

The QSA ensures that the San Diego region receives a minimum of 75 years of stable Colorado River water supplies. On November 5, 2003, the IID filed a validation action in Imperial County Superior Court, seeking a judicial determination that 13 agreements associated with the San Diego

^E <http://www.sdcwa.org/issue-desal>

<http://carlsbaddesal.com/>

County Water Authority-Imperial Irrigation District water transfer and the QSA are valid, legal and binding. Other lawsuits also were filed contemporaneously challenging the execution, approval and implementation of the QSA on various grounds. All of the QSA cases were coordinated in the Sacramento Superior Court. A final judgment invalidating 11 of the 13 agreements in Phase 1 of the trial was entered on February 11, 2010, and subsequently appealed. On December 7, 2011 the Court of Appeal issued its opinion reversing the judgment and remanding to the trial court for further proceedings. The appellate Court decision resolved many issues in the case, including the validity and constitutionality of the QSA. Trial on compliance with the California Environmental Quality Act was held in November 2012. On June 4, 2013, the court validated the 2003 QSA and related 12 agreements regarding transfers and exchanges of Colorado River water between southern California water agencies. The IID, Coachella Valley Water District, MWD, and Water Authority all sought validation of the agreements from the court under California Water Code section 22762 and California Code of Civil Procedure section 860 et seq., quantifying the amount of Colorado River water each agency may divert and subsequently transfer. The court found the agreements to be valid and adopted in compliance with the requirements of the Brown Act and the California Environmental Quality Act (CEQA). The ruling represents the latest chapter in the longstanding dispute regarding the diversion and use of California's apportionment of the Colorado River under state and federal law.

The Water Authority has encouraged the development of additional local water supply projects such as water recycling and groundwater projects, through the award of Local Water Supply Development ("LWSD") incentives of up to \$200 per acre-foot for recycled water and groundwater produced and beneficially reused within the Water Authority's service area. The purpose of the Water Authority's LWSD program is to promote the development of cost-effective water recycling and groundwater projects, that prevent or reduce a demand for imported water and improve regional water supply reliability. The LWSD Program reimburses member agencies for all, or a portion of the difference between the actual per acre-foot cost of producing recycled water, and the revenue generated by the LWSD participant through the sale of that acre-foot of recycled water (not to exceed \$200 per acre-foot). In February 2008, the program was expanded to include funding for local brackish and seawater desalination projects.

5.3 2009 Comprehensive Water Package

On November 4, 2009, the California State Legislature passed a comprehensive package of water legislation (the "2009 State Water Legislation") that included five bills (four of which were subsequently signed by Governor Schwarzenegger) addressing California's statewide water situation, with particular emphasis on the San Francisco Bay/Sacramento-San Joaquin-Delta (Bay-Delta). The 2009 State Water Legislation included an urban water conservation mandate of 20 percent for most localities in the State by 2020, and new regulations establishing strategic monitoring of groundwater levels around the state. The 2009 State Water Legislation also created two new governmental agencies – the Delta Stewardship Council and the Sacramento-San Joaquin Delta Conservancy. The Delta Stewardship Council is charged with developing and implementing a Delta Plan, which would include the Bay Delta Conservation Plan, upon meeting certain conditions. The Sacramento-San Joaquin Delta Conservancy will implement ecosystem restoration activities in the Bay-Delta. In addition, the 2009 State Water Legislation included

legislation addressing unauthorized Bay-Delta water diversions. At this time, it is not known what effect the 2009 State Water Legislation will have on future water supplies.

Additionally, the 2009 Legislation package included an \$11.1 billion State general obligation bond measure. The water bond measure was originally certified to be on the State's 2010 ballot, but was subsequently pulled due to unfavorable public polling. That same bond measure has been subsequently delayed twice, and is now scheduled to be on the November 2014 ballot. During the current 2013-2014 legislative session, several bills have been introduced aimed at reducing and replacing that ballot measure through a reconfiguration of dedicated expenditures in the original water bond. The legislature passed the new \$7.12 billion bond on August 13, 2014 for state water supply infrastructure projects.

5.4 Public Utilities Department

The Department currently purchases approximately 85 to 90 percent of its water from the Water Authority, which supplies the water (raw and treated) through two aqueducts consisting of five pipelines. While the Department imports a majority of its water, it uses three local supply sources to meet or offset potable demands: local surface water, conservation, and recycled water.

The availability of sufficient imported and regional water supplies to serve existing and planned uses within the Department service area is demonstrated in the prior discussion on the water supply reliability of MWD and the Water Authority. The City has been receiving water from the Water Authority since 1947, and during the last 20 years purchased between 139,000 and 235,500 AFY. For CY 2014 water purchases totaled approximately 186,200 AF. Depending upon demands, growth and the success of local water supply initiatives, this could remain somewhat constant or increase up to a projected maximum of 295,998 AFY in 2035 during normal years. For the purpose of this analysis the maximum is used.

5.4.1 Demonstrating the Availability of Sufficient Supplies

Imported Supplies

Section 5, subdivision 11 of the County Water Authority Act states that the Water Authority "as far as practicable, shall provide each of its member agencies with adequate supplies of water to meet their expanding and increasing needs." Depending on local weather and supply conditions, the Water Authority provides between 75 to 95 percent of the total supplies used by its 24-member agencies. As mentioned in Section 4, the Public Utilities Department and other local retail water distributors formed the Water Authority in 1944 for the purpose of purchasing Colorado River water from the MWD.

Local Surface Water Supplies

The Department maintains and operates nine local surface raw water storage reservoirs which are connected directly or indirectly to water treatment operations. In the San Diego region, approximately 13 percent of local precipitation produces surface run-off to streams that supply Department reservoirs. Approximately half of this run-off is used for the municipal water supply, while the remainder evaporates during reservoir storage. In very wet years, the run-off remainder

may spill over the reservoir dams and return to the Pacific Ocean. Average rainfall produces less than half of the average run-off in San Diego. The local climate requires about average rainfall to saturate the soils sufficiently for significant surface run-off to occur. Therefore, most of the run-off to reservoirs is produced in years with much greater than average rainfall. Some flooding may occur even during average or below average rainfall years if the annual rainfall is concentrated in a few intense storms.

The use of local water is affected by availability and water resource management policies. The Department's policy is to use local water first to reduce imported water purchases and costs. The Department also operates emergency and seasonal storage programs in conjunction with its policy.

The purpose of emergency storage is to increase the reliability of the imported water aqueduct system. This is accomplished by maintaining an accessible amount of stored water that could provide an uninterrupted supply of water to the City's water treatment facilities, should an interruption to the supply of imported water occur. The management of reservoirs is guided by Council Policy 400-04, which outlines the City's Emergency Water Storage Program. The policy mandates that the Department store sufficient water in active, available storage to meet six-tenths of the normal annual (7.2 months) City water demand requirements (conservation is not included). Active, available storage is that portion of the water that is above the lowest usable outlet of each reservoir.

The monthly emergency storage requirement changes from month-to-month, and is based on the upcoming seven months water demand. This results in a seasonally fluctuating emergency storage requirement, generally peaking in April and reaching its minimum in October. This seasonally fluctuating requirement makes a portion of the required emergency storage capacity available for impounding or seasonal storage.

The purpose of seasonal storage is to increase imported water supply. This is done by storing surplus imported water in the wet winter season for use during the dry summer season. This may also be accomplished by increased use of imported water in lieu of local water in the winter when local water may be saved in reservoirs or groundwater basins for summer use. In addition to increased water yield, this type of seasonal operation also reduces summer peaking on the imported water delivery system.

Conservation

The Department's Water Conservation Program is effective in promoting permanent water savings. Established by the City Council in 1985, the Water Conservation Program accounts for more than 35,650 acre-feet of potable water savings per year. This savings has been achieved by creating a water conservation ethic, adopting programs, policies and ordinances designed to promote water conservation practices, and implementing comprehensive public information and education campaigns.

The City offers a broad range of conservation methods to help meet the needs of our residential and commercial water customers. These include, but are not limited to, the following:

- Rebate programs for high efficiency toilets, washing machines and commercial water saving devices
- Rebates for replacing grass with sustainable landscapes and micro-irrigation systems
- Residential interior/exterior and commercial landscape survey programs
- Public education and outreach

Research conducted by the City, the Water Authority, and the Water Research Foundation has shown that more than half of residential water-use is outdoors. Therefore, the City has added outdoor conservation programs to focus on water efficient landscaping and irrigation management, which provide the best opportunity to achieve significant water savings.

Tools and services available for customers include:

- Commercial and Residential Water-Use Survey Programs — account for all water-use, determine leaks, and check irrigation systems for proper function and uniform coverage. Residential surveys average 15 percent water savings, while commercial surveys, depending on type of facility, can achieve 15 percent to 25 percent water savings. The current focus is on multi-family surveys.
- Nationally recognized Landscape Watering Calculator — an on-line tool that creates watering schedules based on landscaping features, soil type, and weather data. The Calculator is very popular [<http://apps.sandiego.gov/landcalc/start.do>] and those who have used it are impressed with its ease of use. MWD has adopted this tool and it is available throughout Southern California.
- Water Resources Landscape Database — another tool used to create water budgets and manage irrigation using aerial photographs, GIS maps, weather data, etc. This service has generated significant water savings in City parks, freeway landscapes, schools, and homeowner associations.
- New programs in place include incentives to install water efficient irrigation equipment and evapo-transpiration controllers (smart irrigation clocks that use weather data to set watering schedules); as well as incentives to replace grass with sustainable landscapes.
- The Water Conservation Section teamed up with the Transportation & Storm Water Department to include rain barrels as an item that can receive a rebate through the “Outdoor Water Conservation Rebate Program.” Rain barrels are used to collect rainwater from hard surfaces such as household rooftops. When citizens install a rain barrel at their home, they are helping to maintain a healthy urban watershed by reducing the demand on the potable water system, while also reducing the amount of wet weather runoff that is collected and sent into the public storm water system.
- ‘San Diego Municipal Code (SDMC) 67.06 Water Submeters’ was adopted in April 2010, to encourage water conservation in multi-family residential and mixed-use buildings by requiring the use of water submeters for each individual residential unit. Billing individual

residential units based on the actual amount of water consumed in the unit creates a financial incentive for residents of multi-family residential units to conserve water.

Planning efforts to increase water conservation is an ongoing process. The aforementioned water conservation programs undergo periodic reevaluation to ensure the realization of forecasted savings. Additionally, changes in water conservation technologies may require reassessment of long-range plans. The Department continues to work with proven water conservation programs, while including irrigation management programs to maximize water savings; regularly examines new technologies and annually checks progress towards conservation goals; and, continues to work collaboratively with MWD and the Water Authority to formulate new conservation initiatives. The City's water conservation report, prepared annually, is available at <http://www.sandiego.gov/water/pdf/waterreuse/2013/fy13annualwater130101.pdf>. The report provides an ongoing assessment and status update, redirecting or enhancing efforts as needed. The programs outlined in the document undergo periodic reevaluation to ensure the realization of forecasted savings.

Drought Management

On January 17, 2014, California Governor Jerry Brown declared a drought in California. On February 11, 2014, the Metropolitan Water District of Southern California's Board of Directors declared a Water Supply Alert throughout its 5,200-square-mile service area as part of a set of comprehensive actions to address the state's unprecedented dry conditions. Additionally, on February 13, 2014, the San Diego County Water Authority's Board of Directors unanimously called upon the region's residents, businesses and institutions to increase water conservation efforts in response to severe drought conditions across California. The Board also approved, notifying the Water Authority's 24-member agencies, including the City of San Diego, which is at the Level 1 Drought Watch of the Model Drought Response Ordinance.

The City has an extensive list of permanent water use restrictions that are outlined in San Diego Municipal Code Section §67.3803. These restrictions were updated several times during the last California drought. They are in effect every day in San Diego and include the following limitations:

- a) no runoff/excessive irrigation
- b) repair leaks upon discovery or within seventy-two hours of notification
- c) no watering of paved areas
- d) no overfilling swimming pools and spas
- e) no non- recirculation decorative water fountains
- f) car washing only in a commercial car wash or using a hose with shutoff nozzle or a bucket
- g) new buildings must recycle cooling system water and car wash water
- h) restaurants will only serve and refill water upon request
- i) hotel guests must have the option of not laundering towels and linens daily
- j) no watering after 10 am and before 4 pm (winter)/before 6 pm (summer)

San Diego's permanent water use restrictions are typically similar to the restrictions many local water agencies implement when they invoke their Level 1 water restrictions.

The City's "Drought Response Level 1 – Drought Watch Condition" is typically invoked when the City Council finds a reasonable probability, that there will be a supply shortage and that a consumer demand reduction of up to ten percent is required in order to ensure that sufficient supplies will be available to meet anticipated demands. The Level 1 Drought Watch Condition adds additional water conservation measures that are added to the City's existing permanent water restrictions outlined in SDMC §67.3803. These measures include:

- 1) landscape irrigation limited to assigned three days per week
- 2) when watering without an irrigation system a shut-off nozzle or garden hose sprinkler system on a timer is required
- 3) washing vehicles limited to the same schedule as irrigation (except for: boats which may be washed after use; vehicles with health/safety issues; at a commercial carwash that recycles water)
- 4) use recycled or non-potable water for construction purposes
- 5) fire hydrants for firefighting only
- 6) construction operations can use water only as required by regulatory agencies
- 7) irrigation is not permitted during rain event

The San Diego City Council invoked a "Drought Response Level 1 – Drought Watch Condition" on May 20, 2014, that went into effect on July 1, 2014.

Recycled Water Supplies

In FY 2014, the beneficial reuse of the recycled water was 13,221 AF: 8,417 AF from the NCWRP and 4,804 AF from the SBWRP. Although landscape irrigation continues to be the leading use of the recycled water, the customer base has become more varied over the years with an increase in the number of industrial and dual plumbed meter connections.

Proactive marketing activities targeting existing irrigation customers, to encourage them to convert their cooling systems to recycled water, coupled with outreach efforts to connect new customers have been successful, as recycled water meter connections have increased over 41 percent since 2007. As of June 2014, the City provides recycled water service to 576 retail meters and 4-5 wholesale meter connections, including the City of Poway, Olivenhain Municipal Water District (3 connections) and Otay Water District. The 2013 top ten retail customers included the City of San Diego Park & Recreation Department, Miramar Marine Corps Air Station Miramar, Black Mountain Ranch and Santa Luz HOA, Caltrans, El Camino Memorial Park, U.S. International Boundary & Water Commission, The Irvine Company, Qualcomm, Village Nurseries (Miramar Nursery) and the City of San Diego's Miramar Landfill.

In FY 2014, financial incentives from the sale of recycled water resulted in nearly \$3.2 million in savings towards imported water purchases. The financial incentives are a result of local water

resources development agreements with Metropolitan Water District and the San Diego County Water Authority.

The Department, in cooperation with the Park & Recreation Department, has aggressively pursued the retrofitting of City parkland, street landscaping and open space to use recycled water for irrigation; sites fronting recycled water distribution pipelines were targeted. In 2007 only 23 recycled water meters were serving City sites; as of June 2014 that number has grown to 84 meter connections. The Departments are currently working on retrofitting four additional parks/open spaces. The irrigation retrofits are funded in part by Federal and State grants.

Public Utilities Department's Capital Improvement Program

The Department reevaluates the Water projects contained in the Capital Improvements Program (CIP) and the timing thereof periodically. Changes to the CIP are made to reflect changing priorities within the water system and occur as a result of project scope changes, date revisions, project sequencing, and operational considerations. The Department expended approximately \$840 million from July 1, 2003 through June 30, 2013 on CIP projects. Improvements included projects to upgrade and expand water treatment plants, rehabilitate raw and treated water storage facilities, construct major transmission pipelines, replace and/or upgrade existing pump stations, replace cast iron water mains citywide, expand the recycled water system, and other new supply initiatives. In November 2013, the City Council adopted water rate increases of 7.25 percent beginning on January 1, 2014 and 7.5 percent beginning on January 1, 2015. These rate increases will provide needed revenue to fund the upgrade and expansion of the water system in order to ensure a reliable water supply for all City residents and meet Department of Public Health mandates.

In 2009, the Department initiated a facilities master plan to identify long-term facility needs. With the completion of the water master plan in 2011, over 80 projects were identified through the master planning effort for CIP implementation of fiscal years 2012-2032. Project scopes were developed from facility condition assessments and system evaluations. The prioritization of CIP projects are based on the adopted City Council Policy 800-14 (CP 800-14) as well as inputs from Independent Rates Oversight Committee members and operational staff. The list of prioritized projects will be the basis for 2012-2032 CIP program.

Summary of Supplies

Historic imported water deliveries from the Water Authority to the Public Utilities Department and local surface water, conservation savings and recycled water deliveries are shown in **Table 5-1**.

Table 5-1
Historic Imported, Local and Recycled Water Demands*
Public Utilities Department (Source: 2010 UWMP)

Fiscal Year	Imported Water (acre-feet)	Local Surface Water (acre-feet)	Conservation¹ (acre-feet)	Recycled Water (acre-feet)	Total² (acre-feet)
1990	233,158	22,500	-	-	255,658
1995	162,404	59,024	8,914	-	230,342
2000	207,874	39,098	17,410	3,250	267,632
2005	204,144	26,584	29,410	4,294	264,432
2010	188,337	13,117	34,317	12,173	247,944

Table 5-1 Notes:

¹Conserved water results in savings and is not a direct supply.

²Total includes water supplied and conserved.

*Includes retail and wholesale demands

5.4.2 Plans for Acquiring Additional Supplies

Future Supplies

The Department completed the City Council approved 2012 Long-Range Water Resources Plan (2012 LRWRP) on December 10, 2013. The 2012 LRWRP is a high level strategy document that evaluates water supply and demand-side objectives against multiple planning objectives. The 2012 LRWRP was an open participatory – stakeholder driven process that evaluated over 20 water supply options such as water conservation, recycled water, groundwater storage, brackish groundwater desalination, rainwater harvesting, graywater and potable reuse. The plan takes a long-range viewpoint through the year 2035 in addressing risk and the uncertainty of future water supply conditions. It is a plan that sets the tone or direction of where the City places its efforts in developing local water supplies.

Conservation and water recycling programs have been implemented and are under investigation for ways to be expanded or increased. The Department is also investigating the development of groundwater and potable reuse.

Conservation

Like many agencies in California, the City is committed to reducing its per capita water consumption by at least 20 percent by the year 2020. Aside from the existing programs listed in Section 5.4.1 of this report, the City is also evaluating the following programs to help reduce overall water consumption:

- Water budget based billing for irrigation only customers - An effort is currently underway to evaluate billing irrigation customers based on their ability to meet property specific water use budgets, and implement a tier rate structure that encourages usage within water budgets.

- Conservation-oriented rate structures - The new rate structure, which took effect in January 2014, adds a fourth new tier for single-family residential customers that recognizes water conservation efforts, and increases the rates for higher tiers to discourage high volume usage.
- Automated Meter Interface - The City is starting to install smart water meters in monthly billed accounts. These meters allow remote access to consumption patterns via a web portal, and give water customers data that they can monitor and use to manage better their water consumption.

Recycled Water

Recycled Water Study:

The Recycled Water Study was presented to and unanimously accepted by the City Council on July 17, 2012, following a three-year effort that included extensive stakeholder involvement. The Study can be located at the following link:

<http://www.sandiego.gov/water/pdf/waterreuse/2012/recycledfinaldraft120510.pdf>.

During the 2008 to 2010 Point Loma Wastewater Treatment Plant (Point Loma) permit modification process, San Diego Coastkeeper and the San Diego Chapter of the Surfrider Foundation entered into a Cooperative agreement with the City to conduct the Recycled Water Study (Study). In accordance with the agreement, the San Diego Coastkeeper and the San Diego Chapter of the Surfrider Foundation did not oppose the United States Environmental Protection Agency's (USEPA) decision to grant the permit modification. The City Council authorized the execution of the Cooperative Agreement on February 18, 2009. The modified Permit allows Point Loma to continue operating as a chemically enhanced primary treatment facility (CEPT) for five years until July 31, 2015, when the permit must be renewed rather than upgrading the treatment system to meet secondary standards as required in the federal Clean Water Act. The Study concluded meeting all terms of the Agreement with Coastkeeper and Surfrider.

The Recycled Water Study identified five (5) Reuse Alternatives. Non-Potable Reuse, Indirect Potable Reuse, and wastewater off-load to the Point Loma are the common components of each of the five alternatives. All reuse alternatives presented in the study achieve the study goals, provide a bold vision for the future water reuse in the Metro Service Area, and provides potential savings to ratepayers. For additional details on the Reuse Alternatives, please see the Recycled Water Study Report Dated July 2012 in the above link.

Potable Reuse:

Potable Reuse is an approach the City is considering for maximizing the use of recycled water. Recycled water that is used for non-drinking uses like irrigation and industrial processes, would undergo advanced water purification (AWP) to render it safe for reuse as a drinking water supply. The AWP process uses multiple treatment barriers to remove contaminants from the water and prevent them from re-entering the water supply. It begins with membrane filtration, followed by reverse osmosis, and ends with advanced oxidation. The result is purified water that meets all drinking water standards and is similar in quality to distilled water.

There are two major types: Indirect Potable Reuse (IPR) and Direct Potable Reuse (DPR). With IPR, the purified water is sent to an environmental buffer; for the City's IPR concept, San Vicente Reservoir would be the environmental buffer. The water in San Vicente is treated at a drinking water treatment plant before it is distributed for drinking purposes. Direct potable reuse differs in that there is no environmental buffer. The California Department of Public Health is mandated to determine the feasibility of establishing DPR regulations. Industry experts expect that DPR regulatory criteria to include the use of additional treatment or engineered storage barriers to compensate for the absence of an environmental buffer. The City monitoring the development of DPR regulations and how they might influence the viability of potable reuse implementation.

Water Purification Demonstration Project:

In order to assess the feasibility of indirect potable reuse with reservoir augmentation (IPR/RA), the City initiated a Water Purification Demonstration Project (Demonstration Project). The Demonstration Project evaluated the feasibility of using advanced water purification (AWP) technology to produce water that can be sent to San Vicente Reservoir, subsequently treated, and later be distributed as potable water.

As part of the Demonstration Project, the City tested and operated a one-million gallon per day demonstration-scale AWP Facility from June 2011 to August 2012. The purified water was routinely tested to determine the effectiveness of the treatment equipment, and operating data was gathered to develop a cost estimate for full-scale facilities. A study of San Vicente Reservoir was also conducted to establish residence time and short circuiting conditions of the purified water in the reservoir. An extensive public outreach and education program was implemented to educate the public about the potential benefits and implications of an IPR/RA project. The City also coordinated with the State's regulatory agencies to help define the requirements for an IPR/RA project. The Final Project reports have been completed and are available at the following link: www.purewatersd.org/projectreports. The Demonstration Project reports were presented to full City Council on April 23, 2013. The City Council adopted the Demonstration Project Reports and directed staff to determine a preferred implementation plan and schedule that considers potable reuse options for maximizing local water supply and reduced flows to the Point Loma Wastewater Treatment Plant. This follow on effort, now known as the Pure Water San Diego Program, is described in more detail below.

Pure Water San Diego Program:

The Department's Pure Water San Diego Program (Program) is a 20-year program ending in year 2035. The program will create a safe and reliable local water supply through potable reuse, while reducing the Point Loma Wastewater Treatment Plant's ocean discharges and accomplishing secondary equivalency.

Potable Reuse is an approach the City is considering for maximizing the use of recycled water. Recycled water that is used for non-drinking uses like irrigation and industrial processes, would undergo advanced water purification (AWP) to render it safe for reuse as a drinking water supply. The AWP process uses multiple treatment barriers to remove contaminants from the water and prevent them from re-entering the water supply. It begins with membrane filtration, followed by

reverse osmosis, and ends with advanced oxidation. The result is purified water that meets all drinking water standards and is similar in quality to distilled water.

There are two major types: Indirect Potable Reuse (IPR) and Direct Potable Reuse (DPR). With IPR, the purified water is sent to an environmental buffer; for the City's IPR concept as studied in the Demonstration Project, San Vicente Reservoir would be the environmental buffer. The water in San Vicente is treated at a drinking water treatment plant before it is distributed for drinking purposes. Direct potable reuse differs in that there is no environmental buffer. The California Department of Public Health is mandated to determine the feasibility of establishing DPR regulations. Industry experts expect that DPR regulatory criteria to include the use of additional treatment or engineered storage barriers to compensate for the absence of an environmental buffer. The City monitoring the development of DPR regulations and how they might influence the viability of potable reuse implementation.

For the Pure Water San Diego Program, Department staff have completed most of the technical studies to refine system-wide reuse concepts developed in the Recycled Water Study (July 2012), are developing a cost-sharing framework, serving on an advisory group to an Expert Panel on Direct Potable Reuse (DPR) and Recycled Water, and are continuing tours of the Advanced Water Purification Facility, speakers bureau presentations and community events participation

In addition to the above, Department staff is engaged in the preparation of the National Pollution Discharge Elimination Permit (modified permit) for Point Loma which expires July 31, 2015. The draft modified permit application will be brought forward for City Council consideration in October 2014. Staff is also developing a regulatory and legislative strategy related to Point Loma that will require City Council input and involvement.

The Department is working on implementing the various facets of the Pure Water San Diego Program. Implementation strategy tasks include facility siting studies, engaging key regulatory agencies to develop a modified NPDES permit renewal application which secures long-term compliance with discharge standards at Point Loma through potable reuse and secondary equivalency, and establishing a financing plan and cost-sharing principles with other public agencies that use the City's wastewater system.

This comprehensive effort will provide a secure and reliable long-term local water supply for San Diego while resolving the decade's long issues associated with Point Loma.

Groundwater

There are several groundwater basins in the San Diego region that the City has rights, concerns jurisdiction or otherwise an interest in developing for municipal supply or other beneficial use. These basins are:

- San Pasqual Basin
- Mission Valley Basin
- Santee/El Monte
- Tijuana Basin
- San Diego Formation

The groundwater quality from these basins is predominantly brackish. Improved technologies provide consideration of affordable water sources, such as brackish groundwater, that were not available a few decades ago. Groundwater is a viable alternative and is part of the City's planning efforts. Local water supply projects, particularly groundwater exploration, benefit City rate payers, offer drought protection, and are locally controlled.

The San Diego City Council adopted the San Pasqual Groundwater Management Plan (GMP) in 2007. Several management actions outlined in the GMP are currently being implemented.. For the next several years, basin activities such as surface water and groundwater monitoring programs, water quality testing, basin water budget, and basin capacity studies will be the focus for understanding, protecting and evaluating the long-term sustainable use of the San Pasqual Basin as a water supply source.

The City is the Monitoring Entity for the San Pasqual Basin as identified by the California Statewide Groundwater Elevation Monitoring (CASGEM) program. Working cooperatively with the California Department of Water Resources (DWR), the City established a network of monitoring wells for CASGEM to regularly and systematically track seasonal and long-term trends in groundwater elevations for this alluvial groundwater basin. Included in the monitoring network plan are three multi-level monitoring wells that were installed by the United States Geological Survey under a cooperative agreement with the City. Participation in the statewide CASGEM program allows basin groundwater data to be maintained and readily available through DWR's public data base. The City is reaching out to local agencies and pursuing a Voluntary Cooperative for monitoring entity status of the El Monte/Santee Basin which is located in the upper reach of the San Diego River.

On May 30, 2014, the City completed a Salinity and Nutrient Management Plan (SNMP) for the San Pasqual Basin in compliance with Recycled Water Policy 2009 that was adopted by State Water Resources Control Board (State Board). The City facilitated a stakeholder driven basin-wide approach to complete this effort. The framework for the SNMP incorporated components from the SNMP guidelines (*Salinity/Nutrient Management Planning in the San Diego Region (9), Welch 2010*) adopted by the State Board. The SNMP identified excessive levels of salts and nutrients in areas of the basin and provides Management strategies for protecting and improving groundwater quality for agriculture, potable water supply and for other beneficial groundwater uses.

The City has been investigating Mission Valley Aquifer. Mission Valley is a narrow, east-west trending valley carved out by the San Diego River as it drains westward from Mission Gorge to the Pacific Ocean. The most conducive portion of the aquifer lies within the extent of an historical well field where the City has retained ownership of the property and where a substantial portion is overlain by Qualcomm Stadium and its parking lot. Part of the history is the establishment of the City's pueblo water right, a prior and paramount right to all of the water of the San Diego River (surface and underground). In 1963 a fuel tank farm was built in Mission Valley at the mouth of Murphy Canyon, know as Mission Valley Terminal (MVT). Underground fuel contamination was suspected to being in 1986. From 1986 to 1991 approximately 200,000 gallons of gasoline was released underground from the MTV located upstream of Qualcomm Stadium, and contaminated the aquifer. The contamination extended from the tank farm, beneath Qualcomm property, to

approximately where Interstate 805 crosses the San Diego River. Although remediation of the Mission Valley Aquifer has been ongoing for a period of time, the City is waiting for remediation to be complete before resuming its plans for development of the aquifer for municipal supply.

The City has been producing groundwater from the Santee – El Monte basin from two municipal supply wells. One well is located just downstream of the San Vicente Reservoir and the other is located just downstream of the El Capitan Reservoir. The City is evaluating the expansion of its groundwater production facilities at each location to maximize yield. The City's existing San Vicente Production well was constructed in 2004 and pumps a maximum of 600 gallons per minute. The well conveys groundwater directly to the City's existing raw water line from the reservoir and ultimately to the City's Alvarado Treatment Plant. The well located just downstream of the El Capitan reservoir is installed in a granitic rock formation and extracts water from a fractured rock system at a yield of 50 gallons per minute. This well also conveys groundwater to a raw water pipeline coming from the dam to supply the Alvarado Treatment Plant.

The City desires to use the San Diego Formation for groundwater municipal supply and seeks to manage the safe yield of the aquifer system in a prudent and efficient manner. The City has been engaged in investigating to gain a better understanding of the San Diego Formation Basin for many years. The City has been better able to characterize the water quality and quantity in the San Diego Formation through aquifer testing and monitoring well installation that have occurred since 2007. In addition, the City has been working with the United States Geological Survey to develop an integrated and comprehensive understanding of the geology and hydrology of the San Diego Formation, and to use this understanding to evaluate a sustainable, long-term environmental sound use of the formation for municipal supply.

Section 6 - Projected Demands

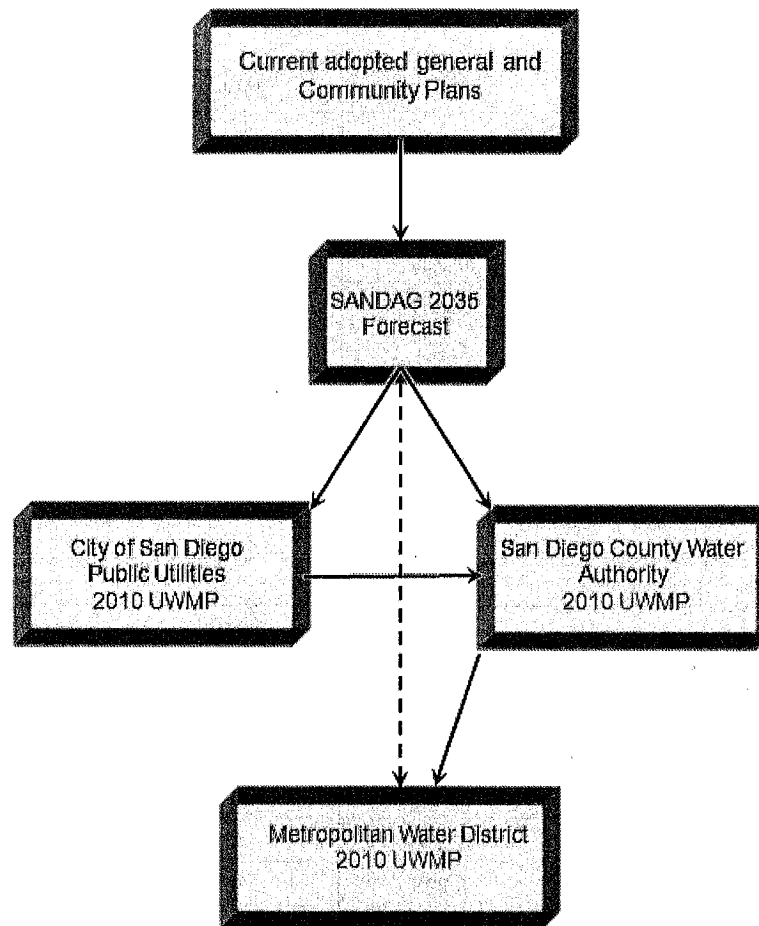
Approximately every three years the Public Utilities Department (Department) calculates projected water demands within its service area for planning purposes. A computer model is used (IWR-MAIN) to break down water-use by major water-use sectors: Commercial, Industrial, Residential and Public uses. Using past water-use data from the Department and demographic data provided by SANDAG land use, the model is able to correlate the data to determine sector water demands. Using this correlated data, future demographic data is used to project water demands. The model also accounts for water conservation, weather and water rate changes.

In addition to the Department, the Water Authority and MWD use regional growth forecasts to calculate projected water demands within their respective service areas. This provides for consistency between the retail and wholesale agencies projected water demands, thereby ensuring that adequate supplies are being planned for the Department's existing and future water users. The SANDAG forecasts are based on adopted community plan land use, but not citywide zoning. SANDAG forecasts the number of residents, dwelling units, and employees in an area, but not square footage, hotel rooms, or visitors (non-residents or non-employees). For urban areas the smallest forecast geography is typically at the block level, but for suburban and less developed areas the forecast geography can be larger. SANDAG typically updates the regional growth forecast every three to four years. The Public Utilities Department water demand projections, based on the SANDAG Series 12 Forecast land use, are incorporated in the City's 2010 UWMP. These projections are then forwarded to the Water Authority for use in the preparation of their UWMP, which is further incorporated into MWD's UWMP to calculate the ultimate water demands of the region (see **Figure 6-1**).

The Department updates its UWMP every five years. The 2010 UWMP, originally scheduled for completion in December 2010, was completed and adopted in June 2011. The time extension granted for the completion of the 2010 UWMP was due to the new SBX7-7 reporting requirement that needed to be incorporated into the 2010 UWMP. SBX7-7, which is part of the 2009 Water Legislation, requires urban water agencies to reduce statewide per capita water consumption 20 percent by 2020.

The Governor has recently signed Assembly Bill (AB) 2067 which amend the water code extending the deadline for submitting 2015 UWMP. The bill would require each urban water supplier to submit its 2015 UWMP to the Department of Water Resources by July 1, 2016.

FIGURE 6-1
WATER DEMAND PROJECTIONS



The demands from the 2010 UWMP are used throughout this Report. The historical and projected water demands for a normal year are shown in **Table 6-1**.

As part of the requirements for complying with SB 610, **Table 6-7** and **Table 6-8** show the single-dry year and consecutive multiple-dry year demands. All tables in this section are based on data from the 2010 UWMP.

TABLE 6-1
PAST, CURRENT, AND PROJECTED WATER DELIVERIES
(AFY)

Water Use Sector	2005				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	217,983	77,864	0	0	77,864
Multi-family	28,443	39,220	0	0	39,220
Commercial	14,468	33,099	0	0	33,099
Industrial	253	4,276	0	0	4,276
Institutional/Governmental	2,341	16,842	0	0	16,842
Landscape Irrigation	7,245	27,877	0	0	27,877
Total	270,733	199,178	0	0	199,178

Source: City of San Diego Public Utilities Report U02-P10715.

Water Use Sector	2010				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	220,862	62,367	0	0	62,367
Multi-family	28,361	36,324	0	0	36,324
Commercial	14,542	27,244	0	0	27,244
Industrial	186	2,325	0	0	2,325
Institutional/Governmental	2,321	13,774	0	0	13,774
Landscape Irrigation	7,327	20,257	0	0	20,257
Total	273,599	162,291	0	0	162,291

Source: City of San Diego Public Utilities Report U02-P100715.

Table 6-1, Continued

Water Use Sector	2015				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	231,346	75,922	0	0	75,922
Multi-family	32,082	47,266	0	0	47,266
Commercial	14,376	31,617	0	0	31,617
Industrial	186	2,071	0	0	2,071
Institutional/Governmental	2,302	13,359	0	0	13,359
Landscape Irrigation	7,583	25,452	0	0	25,452
Total	287,587	195,688	0	0	195,688

Water Use Sector	2020				
	Metered		Unmetered		Total Volume (AFY)
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	
Single-family	236,639	79,992	0	0	79,992
Multi-family	37,330	56,700	0	0	56,700
Commercial	14,783	33,541	0	0	33,541
Industrial	186	2157	0	0	2157
Institutional/Governmental	2,302	13,772	0	0	13,772
Landscape Irrigation	7,869	27,247	0	0	27,247
Total	298,582	213,409	0	0	213,409

Water Use Sector	2025		2030		2035	
	Metered		Metered		Metered	
	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)	# Accounts	Volume (AFY)
Single-family	241,491	83,370	244,138	85,633	245,682	86,471
Multi-family	42,662	66,070	47,910	75,328	52,420	82,781
Commercial	14,681	34,012	14,100	33,116	13,853	32,740
Industrial	176	2,077	166	1,995	166	1,967
Institutional/Governmental	2,247	13,639	2,172	13,399	2,154	13,329
Landscape Irrigation	8,192	28,893	8,162	29,301	8,543	30,698
Total	308,505	228,061	315,534	238,772	321,337	247,986

Table 6-2 summarizes the current and planned water sources the City is relying on to meet future demands.

TABLE 6-2
PLANNED WATER SUPPLY SOURCES
(AFY)

Water Supply Sources	Wholesaler Supplied Volume (yes/no)	2015	2020	2025	2030	2035
San Diego County Water Authority	Yes	201,719	221,458	237,622	249,728	260,107
Supplier produced surface water ^(a)		29,000	29,000	29,000	29,000	29,000
Supplier produced groundwater		500	500	500	500	500
Transfers In		0	0	0	0	0
Exchanges In		0	0	0	0	0
Recycled Water ^(b)		9,253	9,253	9,253	9,253	9,253
Desalinated Water		0	0	0	0	0
Other		0	0	0	0	0
Total		240,472	260,211	276,375	288,481	298,860

Notes:

^(a) Local surface water estimates provided by City, 2011.

^(b) Recycled water excludes recycled water sold to other agencies and is from table entitled, "NCWRP and SBWRP Summary of Baseline Demands", provided by the City on April 22, 2011.

6.1 Water Sales to Other Agencies

Potable Water

The City, through past agreements, sells treated water to the California American Water Company (Cal-Am) which provides water service to the cities of Coronado and Imperial Beach, and Naval Air Station North Island. The population of Naval Station North Island is located within the City of Coronado, whereas the other military bases that the City serves are within the City. The City also sells untreated water to Santa Fe Irrigation District and San Dieguito Water District. **Table 6-3** presents the water sales to other agencies.

Per the agreement between the City and Cal-Am, only local surface water is sold to Cal-Am to provide water to supply Cal-Am customers. A portion of City residents in the South Bay area are also served by Cal-Am and can be served by imported water as well. Per the agreement between the City and the City of Del Mar, the City takes deliveries of water, which the City of Del Mar purchases from the Water Authority, through the Second Aqueduct Connection at Miramar. This water is then treated at the City's Miramar WTP and transported to the City of Del Mar through several interconnections.

The City has agreements to provide surplus treated water to Otay Water District and untreated exchange water to Ramona Municipal Water District. These water deliveries occur infrequently and for short periods of time, and are therefore not shown in **Table 6-3**.

TABLE 6-3
SALES TO OTHER AGENCIES-POTABLE
 (AFY)

Water Distributed	2005	2010	2015	2020	2025	2030	2035
California American Water Company	13,311	11,462	13,153	13,395	13,452	13,757	13,988
Santa Fe Irrigation District and San Dieguito Water District ^(a)	2,012	7,227	7,596	7,983	8,391	8,819	9,268
City of Del Mar ^(b)	1,324	1,058	1,112	1,168	1,228	1,290	1,356
Naval Air Station North Island	1,204	1,568	1,568	1,568	1,568	1,568	1,568
Total	14,515	13,030	14,721	14,963	15,020	15,325	15,556

Notes:

^(a) Through a joint agreement, the City supplies raw water from local surface water supplies to Santa Fe Irrigation District/San Dieguito Water District, and treated water to the other agencies. This water supply is not included in total since the supply is not included in the local surface water supply.

^(b) City of Del Mar not included in total as the City is treating water for Del Mar that is provided by Water Authority.

Recycled and Non-Revenue Water

The City has three separate agreements to sell recycled water. Olivenhain Municipal Water District and the City of Poway are provided recycled water from the City's North City Water Reclamation Plant while Otay Water District receives recycled water from the City's South Bay Water Reclamation Plant.

Non-Revenue Water (NRW) is water that is unaccounted for or unbilled water consumption. Unaccounted for water can be attributed to unauthorized consumption, meter inaccuracies, data errors, leakage on mains, leakage and overflow at storage and leakage at service connections. Using metered demand and total City delivered values, NRW was computed as 8.2 percent in 2012. Water use for firefighting, line flushing and other authorized, but unbilled use is classified in the computation of NRW as unbilled consumption.

City staff deemed it reasonable to assume this percent system loss could be maintained in future years given the City's aggressive program of leak detection and repair. The City is going forward with an automated meter reading system that could improve billing accuracy, better quantify real versus apparent losses and identify customer leaks. Thus, NRW is held constant in the projections at 9.0 percent for forecast years. **Table 6-4** represents the City's additional water uses (recycled water) and NRW.

TABLE 6-4
ADDITIONAL WATER USES AND LOSSES
(AFY)

Water Use	2005	2010	2015	2020	2025	2030	2035
Recycled water	4,294	7,656	9,253	9,253	9,253	9,253	9,253
Non-revenue water	10,404	21,909	20,810	22,586	24,041	25,131	26,065
Total	14,698	29,565	30,063	31,839	33,294	34,384	35,318

Notes:

1. Source for recycled water: 2005 from Table 2-8 of the City's 2005 Urban Water Management Plan. 2010 from NCWRP and SBWRP beneficial reuse summary tables with wholesale deliveries excluded provided by the City on March 2, 2011. 2015 and later from table entitled, "NCWRP and SBWRP Summary of Baseline Demands", provided by the City on April 22, 2011.
2. Recycled water is City use only and excludes recycled water sold to other agencies.
3. Source for non-revenue water: For 2005, Table 2-8 of the City's 2005 Urban Water Management Plan with 4.3% assumption. For 2010 to 2035, City of San Diego Public Utilities, Update of Long-Term Water Demand Forecast, Table 6-5, Water Demand Forecast with Normal Weather, June 2010.

Table 6-5 is a summary of and displays City's past water use from 2005 and 2010 with projected water use shown for 2015 thru 2035.

TABLE 6-5
TOTAL WATER-USE
(AFY)

Water Distributed	Total Water Use (AFY)						
	2005	2010	2015	2020	2025	2030	2035
Total Water Deliveries (Table 6-1)	199,178	162,291	195,688	213,409	228,061	238,772	247,986
Sales to Other Water Agencies (Table 6-3)	14,515	13,030	14,721	14,963	15,020	15,325	15,556
Additional Water Uses and Losses (Table 6-4)	14,698	29,565	30,063	31,839	33,294	34,384	35,318
Total	228,391	204,886	240,472	260,211	276,375	288,481	298,860

The analysis in **Table 6-6** below compares the projected normal water supply and customer demands from 2010 to 2035, in five-year increments.

TABLE 6-6
PROJECTED NORMAL SUPPLY AND DEMAND COMPARISON
(AFY)

	2015	2020	2025	2030	2035
Supply totals	240,472	260,211	276,375	288,481	298,860
Demand totals	240,472	260,211	276,375	288,481	298,860
Difference (supply minus demand)	0	0	0	0	0

6.2 Projected Single-dry Year Water Supply and Demand

Table 6-7 provides a comparison of a single-dry year water supply with projected total water use over the next 25 years, in five-year increments. The City's demands in single-dry years are projected to be higher similar in proportion to the increase in regional water demands projected in the Water Authority's 2010 UWMP. An increase in use for landscape irrigation accounts for most of the increase in demands. It is assumed that recycled water demands would not increase in single-dry years. The wholesale water supplies from the Water Authority are assumed to increase to meet the difference between the City's increased water demands and reduced local water supplies.

TABLE 6-7
PROJECTED SINGLE-DRY YEAR SUPPLY AND DEMAND COMPARISON
(AFY)

	2015	2020	2025	2030	2035
Supply totals	255,040	276,526	293,895	307,230	318,586
Demand totals	255,040	276,526	293,895	307,230	318,586
Difference (supply minus demand)	0	0	0	0	0

6.3 Projected Multiple-dry Year Water Supply and Demand

Table 6-8 compares the total water supply available in multiple-dry water years with projected total water use over the next 25 years. The City's demands in multiple-dry years are projected to be higher, similar in proportion to the increase in regional water demands projected in Water Authority's 2010 UWMP. It is presumed that recycled water demands would not increase in multiple-dry years. The wholesale water supplies from Water Authority are assumed to increase to meet the difference between the City's increased water demands and reduced local water supplies. Multiple-dry year scenarios represent hot, dry weather periods which may generate urban water demands that are greater than normal.

No extraordinary conservation measures are reflected in the demand projections. The recycled water supplies are assumed to experience no reduction in a dry year.

TABLE 6-8
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE
DRY YEAR PERIOD ENDING IN 2035
 (AFY)

		Supply and Demand Comparison – Multiple-dry Year Events				
		2015	2020	2025	2030	2035
Multiple-dry year First year supply	Supply totals	257,587	278,451	296,319	309,230	320,382
	Demand totals	257,587	278,451	296,319	309,230	320,382
	Difference	0	0	0	0	0
Multiple-dry year Second year supply	Supply totals	267,323	288,723	306,726	320,467	332,038
	Demand totals	267,323	288,723	306,726	320,467	332,038
	Difference	0	0	0	0	0
Multiple-dry year Third year supply	Supply totals	281,466	303,004	322,166	334,720	346,823
	Demand totals	281,466	303,004	322,166	334,720	346,823
	Difference	0	0	0	0	0

Section 7 - Conclusion - Availability of Sufficient Supplies

The Project is consistent with water demand assumptions in the regional water resource planning documents of the City, the Water Authority and MWD. The Public Utilities Department receives the majority of its water supply from MWD through the Water Authority. In addition, MWD and the Water Authority have developed water supply plans to improve reliability and reduce dependence upon existing imported supplies. MWD's Regional Urban Water Management Plan and Integrated Resources Plan, the Water Authority's 2010 UWMP and annual water supply report include projects that meet long-term supply needs through securing water from the State Water Project, Colorado River, local water supply development and recycled water.

The forecasted normal year water demands compared with projected supplies for the Public Utilities Department are shown in **Table 7-1**. This demonstrates that with existing supplies and implementation of the projects discussed in the three agencies' planning documents there will be adequate water supplies to serve all anticipated growth (existing and future planned uses) and development.

TABLE 7-1
PROJECTED SUPPLY AND DEMAND COMPARISON – NORMAL YEAR
 (AFY)

	2015	2020	2025	2030	2035
Supply totals	240,472	260,211	276,375	288,481	298,860
Demand totals	240,472	260,211	276,375	288,481	298,860
Difference (supply minus demand)	0	0	0	0	0

Table 7-2 provides a comparison of a single-dry year water supply with projected total water use over the next 25 years, in five-year increments.

TABLE 7-2
PROJECTED SINGLE-DRY YEAR SUPPLY AND DEMAND COMPARISON
 (AFY)

	2015	2020	2025	2030	2035
Supply totals	255,040	276,526	293,895	307,230	318,586
Demand totals	255,040	276,526	293,895	307,230	318,586
Difference (supply minus demand)	0	0	0	0	0

The multiple-dry year scenarios, within a 20-year projection, are shown in **Table 7-3**. This demonstrates that supplies will be adequate to meet all anticipated growth (existing and future planned uses) and development in multiple-dry year periods.

TABLE 7-3
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE
DRY YEAR PERIOD ENDING IN 2035
(AFY)

		Supply and Demand Comparison – Multiple-dry Year Events				
		2015	2020	2025	2030	2035
Multiple-dry year First year supply	Supply totals	257,587	278,451	296,319	309,230	320,382
	Demand totals	257,587	278,451	296,319	309,230	320,382
	Difference	0	0	0	0	0
Multiple-dry year Second year supply	Supply totals	267,323	288,723	306,726	320,467	332,038
	Demand totals	267,323	288,723	306,726	320,467	332,038
	Difference	0	0	0	0	0
Multiple-dry year Third year supply	Supply totals	281,466	303,004	322,166	334,720	346,823
	Demand totals	281,466	303,004	322,166	334,720	346,823
	Difference	0	0	0	0	0

This Report demonstrates that there are sufficient water supplies over a 20-year planning horizon to meet the projected demands of the Project as well as the existing and other planned development projects within the Public Utilities Department service area in normal, dry year, and multiple-dry year forecasts. This Project is proposing water demands which are included in the regional water resource planning documents of the City, the Water Authority, and MWD.

Source Documents

California Department of Water Resources (DWR), Progress on Incorporating Climate Change into Management of California's Water Resources, July 2006 Report
California Climate Change Center, 2006 Biennial Report: Our Changing Climate: Assessing the Risks to California, 2006
California Department of Water Resources Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001, March 2011
DSD Memorandum - Request for assessment and project description, February 2013
MWD 2010 Regional Urban Water Management Plan
MWD Report on Metropolitan's Water Supplies, A Blueprint for Water Reliability, March 2003
MWD Integrated Resources Plan Update, Oct 2010
Public Utilities Department 2010 Urban Water Management Plan
Public Utilities Department Annual 2012 Water Conservation Report
Public Utilities Department Recycled Water Study July 2012
Public Utilities Department Recycled Water Master Plan August 2011
Public Utilities Department Water Purification Demonstration Project Report
Water Authority 2010 Urban Water Management Plan
Water Authority Regional Water Facilities Master Plan, 2003
Water Department Long-Range Water Resources Plan (2002-2030), December 2002
Water Department The City of San Diego Subordinated Water Revenue Bonds, Series 2002, October 2002

Kaziha, Anas

From: Frieauf, Dana [DFrieauf@sdewa.org]
Sent: Monday, October 06, 2014 6:40 PM
To: Steirer, Marsi
Cc: Adrian, George; Bista, Seevani; Kaziha, Anas; Bombardier, Tim
Subject: AFG request to SDCWA
Attachments: Ball Park-Proj Descrip.pdf; Encanto CPU- Project Descrip.pdf; AFG 2010 UWMP -Summary2 (3).pdf

Importance: High

Marsi,

Thank you for your email regarding the Encanto Community Plan Update and revised Ballpark Village Parcel C Residences. Ken is out of the office this week and requested that I respond to your email. The following is the Water Authority's response to your request to use the Accelerated Forecasted Growth (AFG) component of the Water Authority's 2010 Urban Water Management Plan to meet the unanticipated water demands associated with the proposed plan update and project.

The purpose of the AFG component of the demand forecast is to estimate, on a regional basis, additional demand associated with proposed projects not yet included in local jurisdictions' general plans and to plan for sufficient regional supplies to reliably meet the water demand of those projects. The Encanto Community Plan Update and revised Ballpark Village Parcel C Residences identified in your e-mail, meets the criteria for the AFG component of the Water Authority's 2010 UWMP and we are planning to have water supplies to reliably meet the demand associated with the plan update and project. Our accounting of the AFG demand component will be adjusted to reflect the additional demand associated with the proposed plan update and project.

Please let me know if you have any questions or want to discuss further.

Regards,

Dana

Dana Frieauf

Acting Water Resources Manager
San Diego County Water Authority
dfrieauf@sdewa.org
858-522-6749 (work)

From: Steirer, Marsi [<mailto:MSteirer@sandiego.gov>]
Sent: Thursday, September 25, 2014 2:22 PM
To: Weinberg, Ken; Frieauf, Dana; Bombardier, Tim
Cc: Bista, Seevani; Steirer, Marsi; Adrian, George; Kaziha, Anas
Subject: AFG request to SDCWA
Importance: High

Dear Ken,

The City of San Diego is preparing two water supply assessments; the Encanto Community Plan Update and the Ballpark Village Parcel C Residences in accordance with the requirements of SB 610. Please find attached two documents with descriptions of each project. As some of the proposed development for these projects were not accounted for in the SANDAG Series 12 forecast, the water demands associated with the unaccounted growth

were also not included in the City's 2010 Urban Water Management Plan. The unaccounted water demand associated with these projects are as seen in the table below:

Project	Water Demands (Acre Feet per Year)		
	Planned	Projected	Delta
Encanto Community Plan update	5,504.0 AFY	6,963.0 AFY	- 1,460.0
	Portion of the Project Not Accounted for in the SANDAG's Series 12 forecast		- 1,460.0
Ballpark Village Parcel C Residences Project	0 AFY	170.9 AFY	- 170.9
	Portion of the Project Not Accounted for in the SANDAG's Series 12 forecast		- 170.9

The City is requesting the use of the Accelerated Forecasted Growth (AFG) component of the Water Authority's 2010 Urban Water Management Plan to meet the unanticipated water demands associated with these projects, similar to the other projects requested.

Attached is a table showing the total AFG that the City has requested to date.

Your prompt assistance with this request will be greatly appreciated.

Thank you,

Marsi

Marsi A. Steirer
Deputy Director, Long-Range Planning and Water Resources
Public Utilities Department
(o) 619.533.4112 (m) 619.865.7458