

# APPENDIX K

## *Water Supply Assessment and Preliminary Water & Sewer Report*





2013000962



THE CITY OF SAN DIEGO

**M E M O R A N D U M**

DATE: April 29, 2013

TO: Cathy Winterrowd, Assistant Deputy Director, Development Services Department

FROM: Seevani Bista, P.E., Senior Water Resource Specialist, Public Utilities Department

SUBJECT: Water Supply Assessment Report (WSA) for the Kaiser Permanente San Diego Central Hospital Project

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In response to your request, please find attached the approved WSA for the Kaiser Permanente San Diego Central Hospital Project.

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 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 for the Kaiser Permanente EIR, please forward your comments for our review.

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

Seevani Bista

JM/aa

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, P.E., Principal Water Resources Specialist, Public Utilities Department  
John Minhas, P.E., Assistant Engineer, Public Utilities Department  
Jeff Peterson, Development Project Manager, Development Services Department  
RMS 6.8.4





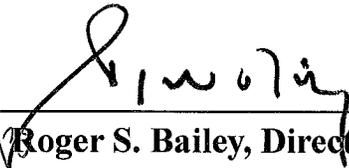
**WATER SUPPLY ASSESSMENT REPORT**

**Kaiser Permanente San Diego Central Hospital**

**Prepared by:**

**City of San Diego Public Utilities Department**

**Approved by:**

*MAS*  
*4/18/13*  
  
\_\_\_\_\_  
Roger S. Bailey, Director of Public Utilities  
*04/25/13*  
Date

**Prepared: April 2013**



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

**Kaiser Permanente San Diego Central Hospital**

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## **Section 1 - Purpose**

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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 these two statutes. Cities, counties, water districts, property owners and developers will all be able to 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 Development Services Department (DSD) requested that the City of San Diego Public Utilities Department (Public Utilities Department) prepare this WSA as part of the environmental review for the Kaiser Permanente San Diego Central Hospital (Project). 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 Public Utilities 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 includes, among other information, 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.

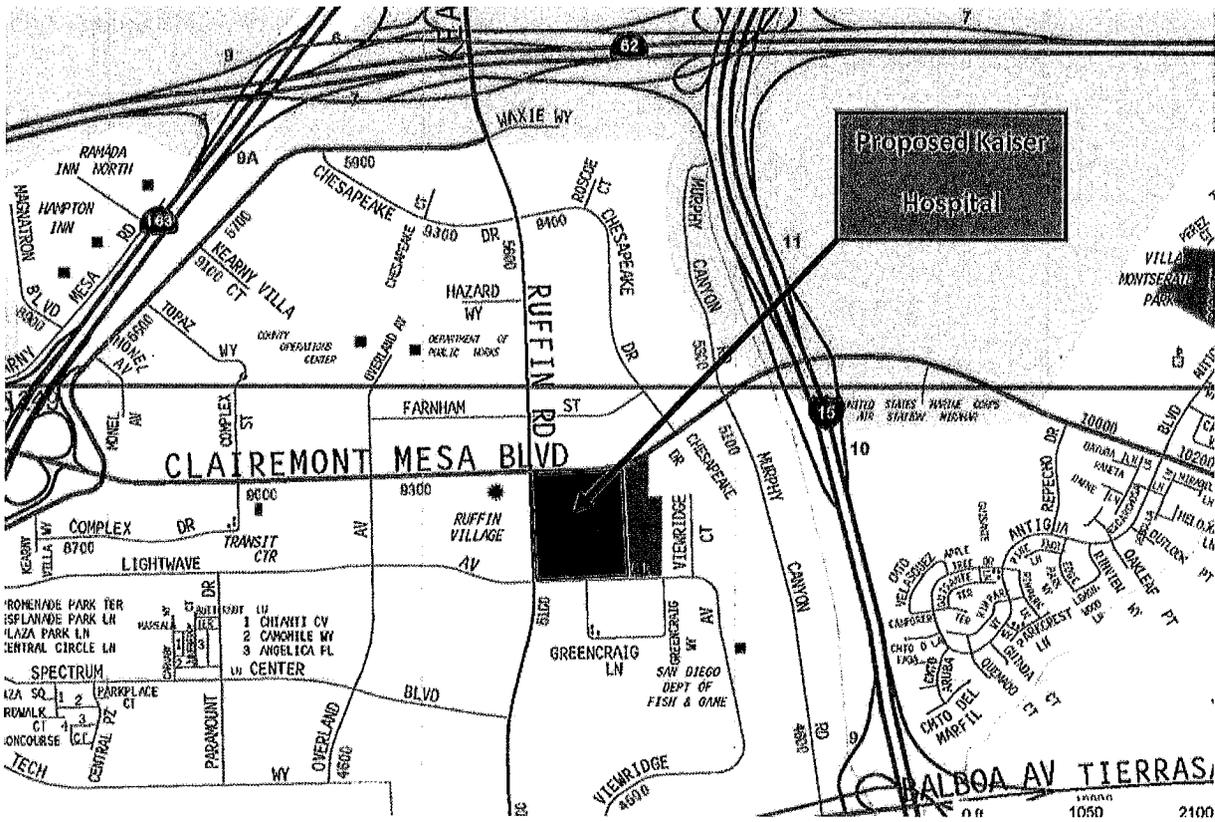
*City of San Diego Public Utilities Department  
Water Supply Assessment Report  
Kaiser Permanente San Diego Central Hospital*

This Report has been prepared in compliance with the requirements under SB 610 by the Public Utilities 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 site is comprised of a 20.67-acre parcel that is currently developed with a single story, 337,564 square-foot structure formerly utilized as the County of San Diego Annex. Located at 5201 Ruffin Road in San Diego, California, the project site abuts the Polanski Child Services Center to the east with street frontage along Clairemont Mesa Boulevard to the north, Ruffin Road to the west, and Ruffin Court to the south. The entire project site was previously graded and is currently developed. The project site is shown in Figure 2-1.

**FIGURE 2-1**  
**VICINITY MAP (reference Thomas Bros. Map 1249 e1)**



The proposed Project will be a new Central Hospital to provide centralized tertiary services for the entire County of San Diego. The new Hospital will serve as a partial replacement to the existing Kaiser San Diego Medical Center. The Project will be constructed in two phases; however, this WSA addresses the ultimate development of both phases which will include 450 beds and 720,000 gross square foot (GSF). In addition, the Project includes an Energy Center of approximately 36,000 GSF, a Hospital Support Building of approximately 180,000 GSF, and a Parking Structure with a total of 2,200 parking stalls. The proposed Hospital Support Building will contain medical offices, exam rooms, pharmacy, and blood draw laboratory. Kaiser is committed to designing both the main hospital building and the Hospital Support Building (HSB) to meet Leadership in Energy and Environmental Design (LEED) Healthcare Gold requirements from which Kaiser is targeting

approximately a 30% total water use reduction from the baseline to achieve the additional LEED water efficiency credit. The City has calculated the Hospital's total water usage including a 15% water usage reduction in those two buildings for this WSA using established baselines for water use by fixtures, food handling and disposal equipment, medical equipment and cooling systems. A Condition of Approval will be required defining that the applicant achieve a minimum of 15% reduction based on the comparison to the EPA established baseline (EPA Act 1992 and 2005, UPC/IPC 2006)). Furthermore, upon receiving the U.S. Green Building Council certificate for a LEED rated project, the Owner/Permittee shall provide a copy of the LEED certificate to City of San Diego Development Services and Public Utilities Departments within twelve (12) months after receiving the Certificate of Occupancy.

Water conservation technologies are also proposed to be employed at the Energy Center for cooling tower and steam boiler. The Project would also include public spaces, landscaping (7.65 acres), hardscape treatments, and utility improvements to support these uses.

## Section 3 - Findings

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### Water Assessment

This Report identifies that the water demand projections for the Project, as proposed, are included in the regional water resource planning documents of the City, the 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 during a 20-year projection to meet the projected demands of the Project, in addition to existing and planned future water demands of the Public Utilities Department.

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<sup>1</sup> (AF) in 2015 to 298,860 AF in 2035 (**Table 6-5**). 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).

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) 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 Public Utilities 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, there is sufficient water planned to supply the Project's estimated annual average usage. The projected water demands of the Project are 205,391 gallons per day or 230 acre feet per year (AFY). Per the City of San Diego 2010 UWMP, the planned water demands of the project's site are 2,400 gallons per day or 2.7 AFY. The remaining portion of the estimated 202,991 gallons per day or 227.3 AFY is accounted for through the Accelerated Forecasted Growth demand increment of the Water Authority's 2010 UWMP. As documented in

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<sup>1</sup> An acre-foot of water equals 325,851 gallons, which is enough water for two average families of four for one year.

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

**TABLE 3-1  
 WATER DEMAND ANALYSIS**

<b>Planned Water Demands for the Project Site per the 2010 UWMP</b>		
<b>Category</b>	<b>Quantity</b>	<b>Estimated Potable Water Use in Gallons per Day</b>
Employees <sup>1</sup>	40	2,400
<b>Total</b>		<b>2,400 or 2.7 (AFY)</b>
<b>Projected Water Demands for Kaiser Permanente San Diego Central Hospital</b>		
Hospital Building (Beds) <sup>2</sup>	450	120,488
Hospital Support Building (square feet) <sup>1,3</sup>	180,000	30,600
Energy Center (square feet) <sup>4</sup>	36,000	40,824
Landscaping (acres) <sup>5</sup>	7.65	13,479
<b>Total</b>		<b>205,391 or 230 AFY</b>
<b>Net Water Demands</b>		
<b>Projected</b>		<b>230 AFY</b>
<b>City of San Diego 2010 UWMP - Planned</b>		<b>2.7 AFY</b>
<b>Planned from Water Authority's Accelerated Forecasted Growth</b>		<b>227.3 AFY</b>
<b>Unanticipated Demands</b>		<b>0</b>

**Table 3-1 Notes:**

1. The utilization of 60 gallons per day (gpd) per person is the City's acceptable standard for employment water use.
2. Hospital domestic water usage calculated based on industry average indoor water use for hospitals of 315 gpd per bed, as determined by the Environmental Protection Agency (EPA), and a 15% reduction accepted by the City for implementation of water conservation measures meeting LEED Healthcare Gold requirements as described in Section 2.
3. At an estimated 300 square foot per employee (data compiled by the City); the building would house approximately 600 employees. This building would also get a 15% water reduction discount for implementing LEED Healthcare Gold requirements. Hence the water demand factor used for the building is  $0.85 \times 60 = 51$  gpd per employee.
4. Cooling Tower water usage based on condenser recirculation rate of 2.8 gpm/ton, temperature differential of 10 degrees Fahrenheit and 50 cycle of concentration (COC). Boiler make-up water usage based on 70% condensate recycles which is easily accomplished in high pressure boilers.
5. Landscaping water demands are based on City's on-line landscaping watering calculator (<http://apps.sandiego.gov/landcalc/start.do>).

## **Conclusion**

In summary, these findings substantiate that there is sufficient water supply planned to serve this Project's future water demands within the Public Utilities 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 Public Utilities 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 Public Utilities Department.*

## **Section 4 - City of San Diego Public Utilities Department**

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The City of San Diego (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 Public Utilities Department purchased a number of reservoirs between 1913 and 1935 to supplement local water supplies. Despite low annual precipitation for 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 before and up to World War II, and the ensuing population boom. As a result, 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 MWD. The Public Utilities Department and other local retail water distributors began receiving imported water from the Colorado River in 1947.

Today, the Public Utilities 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 Public Utilities Department potable water system serves the City of San Diego and certain surrounding areas, including both retail and wholesale customers. The Project is located within the Public Utilities 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 the 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 primarily 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 3,294 miles of transmission and distribution lines.

The Public Utilities 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 and Olivenhain Municipal Water District. The connection provides the City the ability to access 20,000 AF of water in Hodges Reservoir via the Water Authority's delivery system.

The Public Utilities Department maintains and operates three water treatment plants with a combined total rated capacity of 294.4 million gallons per day (MGD). The Miramar Water

Treatment Plant (Miramar WTP), originally constructed in 1962, has a rated capacity of 140 MGD with the ability to increase to 215 MGD in the future with further approval from the State of California Department of Public Health (CDPH) based upon a future treatment process study (High Filtration Rate Study) that is yet to be performed. Current and short term (5 years) forecasted demands indicate no current need to increase the plants rated capacity from 140 MGD to 215 MGD. The required study to increase the rated capacity to 215 MGD will be performed in anticipation and as required to ensure future demands are met. 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 66 MGD. Several hydraulic improvements to the Alvarado WTP were constructed in the mid-1970s to increase the plant's capacity to 120 MGD. Upon completion of ongoing upgrades and improvements and approval of the operations plan by the CDPH, the rated capacity of the Alvarado WTP is anticipated to increase to 200 MGD. 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 originally constructed in 1940, and has a current rated capacity of 34.4 MGD, which meets current and short term forecasted demands. The Otay WTP has hydraulic capacity to increase to 40 MGD in the future. In order to do so, approval is required, similar to the process mentioned above for the Miramar WTP. The Otay WTP generally serves the geographical area bordering Mexico (south San Diego) and parts of the southeastern portion of central San Diego. Recent upgrades to the Otay WTP include a third set of flocculation and sedimentation basins, filter piping and media improvements.

The Public Utilities 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 3,193 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 with larger diameters 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 with smaller diameters that directly service the retail users connected to a meter. In addition, the Public Utilities 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 Public Utilities 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's), the Sweetwater Authority (Otay WTP) and the Otay Water District (Otay WTP).

#### **4.2 Overview of Recycled System Facilities**

The City of San Diego built the North City Water Reclamation Plant (NCWRP) and the South Bay Water Reclamation Plant (SBWRP) to treat wastewater to a level approved for irrigation, manufacturing, and other non-potable purposes.

The NCWRP provides recycled water to businesses, golf courses, homeowner associations, and

other users in the northern service area of the City; as well as the City of Poway and the Olivenhain Municipal Water District. The NCWRP currently treats 16.5 MGD of wastewater, although the Plant has an ultimate treatment capability of 30 MGD. In CY 2012, an average of 7.2 MGD of the wastewater flows were treated to a tertiary level and beneficially reused. The Public Utilities Department maintains and operates the North City recycled water distribution system which consists of 83 miles of recycled water pipeline, two reservoirs, and two pump stations and delivers recycled water to more than 550 meters.

In July 2006 SBWRP began production of recycled water with service to the International Boundary and Water Commission (IBWC). Recycled water production at South Bay expanded in May 2007 when the Otay Water District began taking deliveries. The SBWRP currently treats approximately 8.5 MGD of wastewater, although the Plant has an ultimate treatment capability of 15 MGD. In CY 2012, an average of 4.3 MGD of the wastewater flows were treated to a tertiary level and beneficially reused. The Public Utilities Department maintains and operates the South Bay recycled water distribution system which consists of 1.7 miles of pipe within the SBWRP, 0.7 miles to the International Boundary Commission treatment plant and 0.8 miles to the Otay Water District connection, for a total of 3.2 miles recycled water pipeline; one storage tank; and one pump station.

## **Section 5 - Existing and Projected Supplies**

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The Public Utilities Department relies on imported water as its major water supply source, and is a member public agency of the Water Authority. The Water Authority is a member agency of MWD. The statutory relationships between the Water Authority and its member agencies, and MWD and its member agencies, respectively, establish the scope of the Public Utilities Department's entitlements to water from these two agencies. Due to the Public Utilities 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 of San Diego 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 January 21, 2010, relating to Water Revenue Bonds 2010B, and MWD's Official Statement, dated September 8, 2011, relating to Water Revenue Refunding Bonds, 2011 Series C. These Official Statements are available at the following websites<sup>1</sup>:

<http://www.sdcwa.org/sites/default/files/files/finance-investor/2010Bond.pdf>

<http://www.mwdh2o.com/mwdh2o/pages/finance/statement.html>

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

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

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<sup>1</sup> This information is current at the time this document was prepared.

## **5.1 Metropolitan Water District of Southern California**

MWD was created in 1928, under 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 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 18% of 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 the service area of MWD during years of normal precipitation. Although MWD plans and manages reserve supplies to account for normal occurrences of drought conditions, regulatory restrictions, including but not limited to restrictions under the Federal and California Endangered Species Acts, have 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 MWD’s establishment in 1928. The Colorado River Aqueduct, which is owned and operated by MWD, is 242 miles long, starting at Lake Havasu and terminating at Lake Mathews in Riverside County.

Under applicable laws, agreements and treaties governing the use of water from the Colorado River, California is entitled to 4.4 million acre-feet of Colorado River water annually, plus one-half of any surpluses that may be available for use collectively in Arizona, California and Nevada as declared 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.

Several fish species 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 SWP is owned by the State of California and operated by the State Department of Water Resources (“DWR”). The SWP transports Feather River water stored in and released from Oroville Dam and unregulated flows diverted directly from the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (“Bay-Delta”) south via the California Aqueduct to four delivery points near the northern and eastern boundaries of MWD. The total length of the California Aqueduct is 444 miles. MWD is one of 29 agencies that have long-term contracts for water service from DWR, but is the largest agency in terms of the number of people it serves, 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 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. Since 2008, layers of new pumping restrictions have been put in place to address the migration pattern of various fish species. Delta pumping restrictions now exist in nine out of twelve months of the year. The result is a loss of supply of approximately 30 percent in an average year.

## **5.2 San Diego County Water Authority**

The Water Authority’s 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. Growth has primarily resulted from the addition and annexation of service areas by member agencies. The City of San Diego, with 210,726 acres, is the largest service area within the Water Authority's total service area. Of the total population of San Diego County, 97 percent live within the Water Authority's service area. The City of San Diego represents approximately 43 percent of the total population of the Water Authority's service area.

The Water Authority's service area is a semi-arid region where historically the natural occurrence of water from rainfall and groundwater provides a firm water supply for only a small portion of the water needs 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, but serves only its member agencies.

The Water Authority's mission is to provide its service area a safe and reliable water supply. Historically, the principal source of supply for the Water Authority's service area has been water purchased by the Water Authority 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 Water Authority's water supplies. Therefore, consistent with its mission statement, the Water Authority has actively pursued a strategy of supply diversification that includes the 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 the Water Authority's sources of imported water through core and spot water transfers with other agencies.

The Quantification Settlement Agreement (QSA) for the Colorado River was completed in October 2003. This historic agreement was enacted to provide California the means to implement water transfers and supply programs that will allow California to live within the state's 4.4 million acre-foot basic annual apportionment of Colorado River water. 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 benefits the Water Authority include the San Diego County Water Authority-Imperial Irrigation District water transfer agreement, which will provide up to 200,000 acre-feet of water a year through water conservation measures in Imperial Valley. The QSA also allows for the transfer of water conserved from the concrete lining of portions of the previously earthen All-American and Coachella Canals from the Imperial Irrigation District. The canal lining projects reduce the loss of water that occurs through seepage. The Water Authority receives approximately 77,700 acre-feet of this conserved water annually.

The QSA intended to assure California up to 75 years of stability in its Colorado River water supplies. On November 5, 2003, the Imperial Irrigation District (IID) filed a validation action in Imperial County Superior Court, seeking a judicial determination that 13 agreements associated with the IID/SDCWA 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. The outcome is still pending.

The Water Authority has encouraged 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 Bay-Delta. The 2009 State Water Legislation included, among other things, a 20 percent water conservation mandate for most localities in the State by 2020, new regulations regarding voluntary monitoring of groundwater levels by localities, and an \$11.1 billion State general obligation bond measure. 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.

The \$11.1 billion State general obligation bond measure originally set to be presented to the voters for their approval in 2010 would provide funding for projects and programs throughout the State and in the Bay-Delta. Major categories of bond funding would include statewide water system operational improvements, Bay-Delta sustainability, water supply reliability, conservation and

watershed protection, groundwater protection, water quality improvements, and water recycling and water conservation.

On August 9, 2010, the California Legislature voted to postpone the water bond to the 2012 general elections. The decision was made since the state was facing a massive budget deficit and the chances of the bond passing by a general vote were slim. Postponing the bond required amendment of the water bond legislation. Governor Schwarzenegger affirmed that delaying the bond will not impact other parts of the 2009 water legislation. Supporters of the bond say that the delay will help lawmakers eliminate any imperfections in the bond. The California State Legislature approved a bill on July 5, 2012, to take the measure off the 2012 ballot and put it on the 2014 ballot.

Additional information regarding the 2009 Comprehensive Water Package can be found at the following website: <http://www.sdcwa.org/>

#### **5.4 Public Utilities Department**

The Public Utilities 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 Public Utilities 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 Public Utilities 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, has purchased between 100,000 and 228,000 AFY. For Calendar Year 2012 water purchases totaled approximately 170,878 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 298,860 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 Public Utilities 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 the local precipitation produces surface runoff to streams that supply Public Utilities 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 runoff in San Diego. The local climate requires about average rainfall to saturate the soils sufficiently for significant surface runoff 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 Public Utilities Department's policy is to use local water first to reduce imported water purchases and costs. The Public Utilities 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 Public Utilities 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 May 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 Public Utilities 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 35,000 AF 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 turf with sustainable landscapes and micro-irrigation systems
- Residential interior/exterior and commercial landscape survey programs
- Regulations such as Water Conservation Act of 2009 ( SBX7-7) to meet 20x2020 goals
- Rebates to replace landscape and improve irrigation efficiency
- 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 and being developed 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% water savings, while commercial surveys, depending on type of facility, can achieve 15% to 25% 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 turf with sustainable landscapes.

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 Public Utilities Department continues to work with proven water

conservation programs, while including irrigation management programs to maximize water savings. The Public Utilities Department regularly examines new technologies and annually checks progress towards conservation goals. The Public Utilities Department 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/2012/fy12annualwater121221.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**

In response to the Governor's Executive Order in 2008, the Mayor declared a water shortage emergency for the City of San Diego under Municipal Code and implemented a "Level 1 – Voluntary Compliance – Water Watch" and called for redoubling of efforts aimed to achieve voluntary water reduction. Also in 2008, the Mayor directed the Public Utilities Department to review the City's existing Emergency Water Regulations and propose amendments with the goal of improving the City's response to water shortage conditions. The review resulted in a series of amendments to the existing Municipal Code which established year-round water waste prohibitions, provided clear water shortage "triggers" for moving from one drought response level to another, provided clear targets for achieving water use reductions, and provided an updated penalty and hardship variance process which governs the application and enforcement of the emergency water restrictions. These amendments became effective January 14, 2009. On April 27, 2009 the City Council adopted a "Level 2 – Drought Alert". Level 2 consists of additional mandatory water use restrictions. These restrictions became effective on June 1, 2009. In FY 2011, an unusually heavy snow and rainfall season brought California's water storage levels way up after three drought years. Following the footsteps of DWR, MWD and the Water Authority, the San Diego City Council voted to end Level 2 mandatory water-use restrictions in May 2011. The Public Utilities Department continued the message of promoting water conservation and using water wisely through the "San Diegans Waste No Water" campaign and through the promotion of water conservation programs, including the landscape rebates. In the fall of 2011, the City made minor amendments to the eleven permanent water use restrictions. These restrictions remain in effect at all times and are enforced by Water Waste Field Representatives.

### **Recycled Water Supplies**

Recycled water is produced from wastewater processed at two water reclamation plants owned and operated by the City of San Diego: North City (NCWRP) and South Bay (SBWRP). The NCWRP has a wastewater treatment capacity of 30 MGD, with current wastewater flows to the plant averaging 17 MGD. The SBWRP has a wastewater treatment capacity of 15 MGD, with current wastewater flows to the plant averaging 8.5 MGD. Recycled water produced in CY 2012 averaged 7.2 MGD and 5.7 MGD for NCWRP and SBWRP respectively. In CY 2012, financial incentives from the sale of recycled water resulted in nearly \$2.77 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.

In CY 2012, the beneficial reuse of the recycled water was 12,439 AF: 7,795 AF from the North City Water Reclamation Plant and 4,644 AF from the South Bay Plant. Although landscape irrigation continues to be the leading use of the water, the customer base has become more varied over the years with an increase in the number of industrial/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 37 % (2007 figures compared to 2012). On December 31, 2007, 406 retail meters were connected to the distribution system and as of December 2012, 556 retail meters are connected. The City also provides recycled water to four wholesale customers. Major retail customers include the City of San Diego Park & Recreation Department, CalTrans, University of California at San Diego, Black Mountain Ranch HOA, Santa Luz Golf Course, the City of San Diego Metro Biosolids Center, Qualcomm, Miramar Marine Corps Air Station Golf Course, and U.S. International Boundary & Water Commission.

In 2007, per the Major's directive, the Public Utilities Department aggressively pursued the retrofit of City sites to use recycled water for irrigation; sites fronting recycled water distribution pipelines were targeted. At the time, there were 23 City sites using recycled water, in 2012, the numbers tripled to 79 sites. The Department is currently working on retrofitting three additional parks/open space. The irrigation retrofits are funded in part by Federal and State grants.

### **Public Utilities Department's Capital Improvement Program**

The Public Utilities 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 Public Utilities Department expended approximately \$869 million from July 1, 2002 through June 30, 2012 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 February 2007, the City Council adopted water rate increases for the next four fiscal years of 6.5% per year. These rate increases provided needed revenue to continue funding the upgrade and expansion of the water system through the CIP in order to ensure a reliable water supply for all City residents and meet California Department of Public Health mandates. For the Fiscal Years ending June 30, 2008 through June 30, 2011, the Public Utilities Department expended approximately \$390 million on such improvements.

With the above CIP program coming to a close, the Public Utilities Department initiated a water facilities master plan in 2009 to identify long-term facility needs. Over 80 projects were identified through this master planning effort and will comprise the 2012-2032 CIP. Project scopes were based on findings primarily from facility condition assessments and system evaluations that identified areas in which hydraulic performance criteria cannot all be met. Council Policy 800-14 (CP 800-14) establishes a framework for prioritizing CIP projects, and it has been refined to reflect water-specific needs. The refined framework has provided a mechanism for objectively and consistently prioritizing over 80 recently-identified projects. CP 800-14 refinements were made

with significant input from staff throughout the department as well as IROC (Independent Rates Oversight Committee). The list of prioritized projects, along with cost estimates and durations, will be the basis for 2012-2032 CIP.

**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**

<b>Fiscal Year</b>	<b>Imported Water (acre-feet)</b>	<b>Local Surface Water (acre-feet)</b>	<b>Conservation<sup>1</sup> (acre-feet)</b>	<b>Recycled Water (acre-feet)</b>	<b>Total<sup>2</sup> (acre-feet)</b>
<b>1990</b>	233,158	22,500	-	-	255,658
<b>1995</b>	162,404	59,024	8,914	-	230,342
<b>2000</b>	207,874	39,098	17,410	3,250	267,632
<b>2005</b>	204,144	26,584	29,410	4,294	264,432
<b>2010</b>	188,337	13,117	34,317	12,173	247,944

<sup>1</sup>Conserved water results in savings and is not a direct supply.

<sup>2</sup>Total includes water supplied and conserved.

\*Includes retail and wholesale demands

**5.4.2 Plans for Acquiring Additional Supplies**

**Future Supplies**

In 2002, the City of San Diego City Council adopted the Long-Range Water Resources Plan (Long-Range Plan) 2002-2030. This plan provides a decision-making framework for evaluating water supply options. The Long-Range Plan identifies water conservation, water recycling, groundwater desalination, groundwater storage, ocean desalination, marine transport, water transfers, and imported supply from the Water Authority and MWD as potential near-term and long-term supplies. The Long-Range Plan concluded that no single supply source would be sufficient to meet the City’s future water demands, but a portfolio of supply options would reduce the dependence upon imported water over time.

The Public Utilities Department is working on the 2012 Long-Range Water Resources Plan (2012 LRWRP) and will have the report complete in 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 indirect 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 place's its efforts in developing our local water supplies.

Conservation and water recycling programs have been implemented and are under investigation for ways to be expanded or increased. The Public Utilities Department is also currently investigating the development of groundwater and indirect potable reuse (IPR). While the City is investigating these supply alternatives, it will not count on these water supply options until they have been fully developed, and received approval by the Mayor and City Council, upon which they will then be included in the next UWMP.

### **Conservation**

Future conservation supply development programs and technologies that may be pursued include:

#### **Water-Wise Business Surveys:**

A Water-Wise Business Survey is a new free service that was implemented in FY 2012. The survey provides all City of San Diego Public Utilities Department's commercial, industrial and institutional customers with a customized review of their water usage, including an on-site visit to identify areas where water use efficiencies can be achieved and effectively implemented. Recommendations can help customers use water more efficiently and save energy.

#### **Rain Barrel Rebates:**

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, and 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:**

This municipal code was recently adopted 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 will create a financial incentive for residents of multi-family residential units to conserve water.

## **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>. The Study was initiated as a result of a Cooperative Agreement the City entered into with San Diego Coastkeeper and the San Diego Chapter of Surfrider Foundation . The City Council authorized the execution of the Cooperative Agreement on January 27, 2009. The Agreement required 1) that the City complete a study before August 1, 2012, to find ways of maximizing reuse to minimize wastewater flows to the Point Loma Wastewater Treatment Plant (Point Loma); and 2) that Coastkeeper and Surfrider not oppose the United States Environmental Protection Agency's (USEPA) 2010 decision to renew Point Loma's modified National Pollutant Discharge Elimination System Permit (Permit). The modified Permit allows Point Loma to continue operating as a chemically enhanced advanced primary treatment facility rather than be upgraded to meet secondary standards as required in the federal Clean Water Act. With this study the City met all terms of the Agreement with Coastkeeper and Surfrider.

The Recycled Water Study identified five (5) Reuse Alternatives. If all five alternative are implemented it could result in a combination of Non-Potable Reuse, Indirect Potable Reuse, and wastewater off-loaded to the Point Loma Wastewater Treatment Plant. 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.

### **Indirect Potable Reuse (IPR):**

Indirect potable reuse (IPR) represents a relatively new approach for maximizing the use of recycled water. The term "indirect" refers to the distinction that the purified water is mixed with a natural water source (groundwater basin or surface reservoir) that can be used as a source of drinking water. Reservoir augmentation has been proposed for IPR for the City. IPR involves a three-step process after tertiary treatment of wastewater:

1. Purifying the tertiary-treated wastewater using advanced treatment processes, including membrane filtration, reverse osmosis, and advanced oxidation technologies (ultra-violet disinfection and hydrogen peroxide);
2. Adding the purified water to a surface water reservoir located upstream of a drinking water treatment plant for blending with existing reservoir water; and
3. Further treating the water from the reservoir at a downstream drinking water plant before being distributed to customers.

### **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 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 make City residents aware of the potential implications and benefits 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](http://www.purewatersd.org/projectreports). The Demonstration Project reports were presented to City Council Natural Resources and Culture (NR&C) Committee on March 20, 2013 and will be presented to full City Council later this spring.

The Demonstration Project is an essential step towards implementation of an IPR/RA program. The project budget was set at \$11,811,000 with funding obtained through a temporary rate increase and Proposition 50 grant funding. The rate case was in effect from January 1, 2009 to September 1, 2010. The United States Bureau of Reclamation also awarded the City grant funding, which has provided an additional offset to demonstration project costs.

### **Groundwater**

The City has several groundwater basins within its jurisdiction, including San Pasqual in the north; San Diego River System in the center of the City, comprising of the Mission Valley Basin and the El Monte/Santee Basin; the Tijuana River Valley Basin in the south; and the San Diego Formation, a large geological water bearing formation, underlying the southwestern portion of San Diego County along the coast, roughly from the Mexican border to Mission Valley. The groundwater from these basins is predominantly brackish. Improved technologies provide consideration of affordable water supply sources, such as brackish groundwater, that were not available a few decades ago. This supply source 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 City is presently pursuing groundwater feasibility projects in San Pasqual, Mission Valley Basin, El Monte/Santee Basin, and the San Diego Formation.

In the San Pasqual Basin, the San Pasqual Brackish Groundwater Desalination Demonstration Project is complete. A small-scale demonstration project examined the viability of implementing a full-scale desalination facility in the lower western end of the San Pasqual basin. The study concluded that the groundwater from the basin could be processed for potable use. Also completed is a first phase planning study for the San Pasqual Conjunctive Use which investigated

storage and recovery of raw water in the upper eastern portion of the San Pasqual basin. Identified in the report are percolation basins alternatives, and facility evaluations with cost estimates. The next phases currently underway and expected to be complete in summer 2013 will define and evaluate alternative source water for recharge which includes raw and recycled water alternatives. Finally, basin management actions from the Council adopted 2007 San Pasqual Groundwater Management Plan (GMP) continue to be implemented. Basin management actions such as surface water and groundwater elevation monitoring programs, water quality testing, groundwater data management, basin nutrient studies, and Groundwater Management State of the Basin Reports will assist to understand, protect and enhance long term sustainability of this groundwater resource for beneficial use.

The City is analyzing and evaluating opportunities in the Mission Valley Basin, El Monte/Santee Basin, and the San Diego Formation known as the Pilot Production Wells Investigation program. The goal of this investigation is to install a single production well in each of the basins to test the performance of the basin, evaluate potential environmental impacts, and assess appropriate treatment technologies for approximate two year duration while delivering the groundwater for beneficial use. At the end of the testing period (2015 -2020), the City will decide whether to keep the wells in operation, expand the facilities, or shut down operations depending on the outcome of the investigation in each basin.

## **Section 6 - Projected Demands**

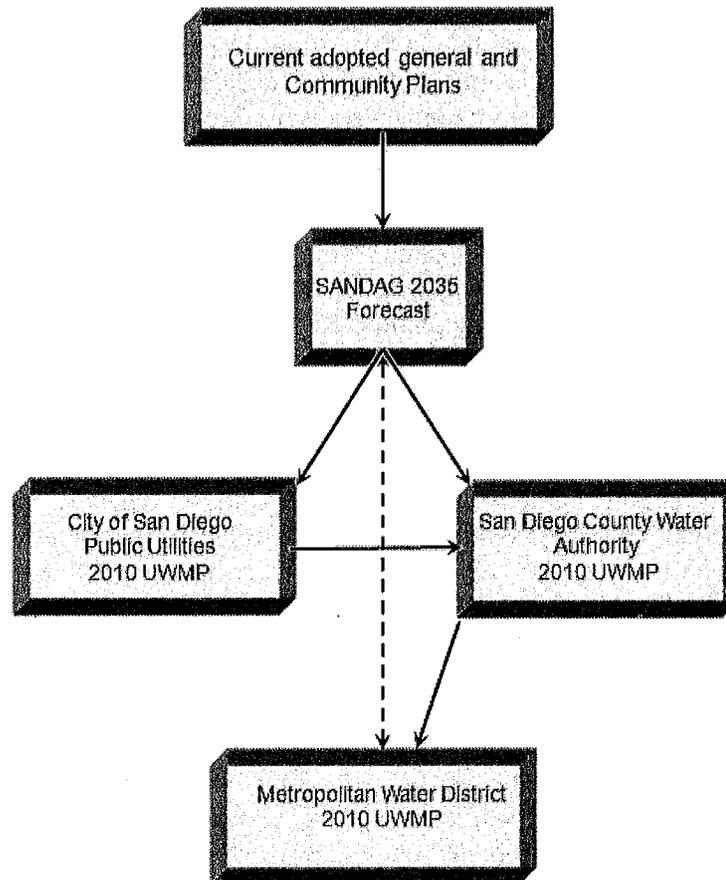
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Approximately every three years the Public Utilities Department calculates projected water demands within its service area for planning purposes. A computer model is used (IWR-MAIN) to break down water-use by major water-use sectors: Commercial, Industrial, Residential and Public uses. Using past water-use data from the Public Utilities Department and demographic data provided by SANDAG, 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 Public Utilities 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 Public Utilities 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 area 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, 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 Public Utilities 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.

**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				Total Volume (AFY)
	Metered		Unmetered		
	# 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
<b>Total</b>	<b>270,733</b>	<b>199,178</b>	<b>0</b>	<b>0</b>	<b>199,178</b>

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

Water Use Sector	2010				Total Volume (AFY)
	Metered		Unmetered		
	# 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
<b>Total</b>	<b>273,599</b>	<b>162,291</b>	<b>0</b>	<b>0</b>	<b>162,291</b>

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

City of San Diego Public Utilities Department  
 Water Supply Assessment Report  
 Kaiser Permanente San Diego Central Hospital

**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
<b>Total</b>	<b>287,587</b>	<b>195,688</b>	<b>0</b>	<b>0</b>	<b>195,688</b>

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	2,157	0	0	2,157
Institutional/Governmental	2,302	13,772	0	0	13,772
Landscape Irrigation	7,869	27,247	0	0	27,247
<b>Total</b>	<b>298,582</b>	<b>213,409</b>	<b>0</b>	<b>0</b>	<b>213,409</b>

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
<b>Total</b>	<b>308,505</b>	<b>228,061</b>	<b>315,534</b>	<b>238,772</b>	<b>321,337</b>	<b>247,986</b>

**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 <sup>(a)</sup>		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 <sup>(b)</sup>		9,253	9,253	9,253	9,253	9,253
Desalinated Water		0	0	0	0	0
Other		0	0	0	0	0
<b>Total</b>		<b>240,472</b>	<b>260,211</b>	<b>276,375</b>	<b>288,481</b>	<b>298,860</b>

Notes:

<sup>(a)</sup> Local surface water estimates provided by City, 2011.

<sup>(b)</sup> 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 Sales to other Agencies

### Potable

The City, through past agreements, sells treated water to the Cal-Am which provides water service to the cities of Coronado and Imperial Beach, City of Del Mar, 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 <sup>(a)</sup>	2,012	7,227	7,596	7,983	8,391	8,819	9,268
City of Del Mar <sup>(b)</sup>	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
<b>Total</b>	<b>14,515</b>	<b>13,030</b>	<b>14,721</b>	<b>14,963</b>	<b>15,020</b>	<b>15,325</b>	<b>15,556</b>

Notes:

<sup>(a)</sup> 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.

<sup>(b)</sup> 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
<b>Total</b>	<b>14,698</b>	<b>29,565</b>	<b>30,063</b>	<b>31,839</b>	<b>33,294</b>	<b>34,384</b>	<b>35,318</b>

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
<b>Total</b>	<b>228,391</b>	<b>204,886</b>	<b>240,472</b>	<b>260,211</b>	<b>276,375</b>	<b>288,481</b>	<b>298,860</b>

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 assumed 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's 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**

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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, July 2012  
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  
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

# Kaiser Permanente San Diego Central Hospital Medical Center *Preliminary Water & Sewer Report*

*Prepared by:*

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## 1.0 INTRODUCTION

Kaiser Permanente proposes to construct a new medical center at 5201 Ruffin Road in the City of San Diego. The 20 acre project site has been previously developed and is currently used for offices for the County of San Diego. The proposed project shall include a hospital support building, central utility plant, loading dock and include both surface and structured parking. The site shall be master planned to accommodate a 450 bed medical facility. The purpose of this study is to analyze the existing sanitary sewer and potable water capacities in order to determine if there is adequate service to support the proposed project. Depending on the results of the study, this study shall provide recommendations for any upgrades needed to properly serve the project.

This study is divided into two parts. Part one discusses the potable water system and part two discusses the sanitary sewer. Both sections describe the existing conditions as well as the proposed demands generated by the project.

## 2.0 POTABLE WATER

### 2.1 Existing Conditions

The site is bounded by Ruffin Court, Ruffin Road and Clairemont Mesa Boulevard. There is a 12-inch diameter asbestos pipe (ACP) along Ruffin Court, Ruffin Road (south of Clairemont Mesa Boulevard) and Clairemont Mesa Boulevard and a 16-inch diameter ACP along Ruffin Road north of Clairemont Mesa Boulevard. Also within Ruffin Road is a 36-inch diameter ACP (Montgomery Pipeline) and a 54-inch diameter steel pipe (Clairemont Mesa Cross Tie Pipeline) within Clairemont Mesa Boulevard. There are fire hydrants along the 12-inch diameter ACP pipelines. See FIGURE 1 and City Gate Pages H11S, I11S and I12S.

The 36 and 54-inch pipelines at the corner of Ruffin Road and Clairemont Mesa Boulevard are within the 752 Pressure Zone. The existing grade at this location is approximately 416.

The existing "County" site has numerous water and fire laterals off the 12-inch ACP along Ruffin Road. These will be capped and removed as part of the proposed improvements.

### 2.2 Water Demands.

Water demands for the proposed development is based on requirements listed in City of San Diego Facility Design Guide, dated 2004. Average day flow (ADF), maximum day and peak hour demands were obtained as follows:

Gross area of the site = 20.7 acres (total floor area 900,000 SF or 20.67 acres)

Net area  $20.7 \times 0.8 = 16.6$  acres

Hospital demand (ADF) = 22,500 gallons per net acre per day

= 373,500 gallons per day (GPD) or 259 gallons per minute (GPM) or 0.6 cubic feet per second (CFS)

Maximum day = 821,700 GPD or 571 GPM or 1.32 CFS

Peak Hour = 1,979,550 GPD or 3.2 CFS

Fire demand = 4,000 GPM or 8.9 CFS for commercial development

Fire demand = 6,000 GPM or 13.4 CFS for industrial development

Fire demands utilizing requirements in Fire Suppression Rating Schedule will be developed and compared to the quantities listed above.

Also, fire demands will be supplied from at least two fire hydrants within a maximum radius of 750 feet from the fire.

**Water Demand Design: City of San Diego Facility Design Guide**

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Hospital Unit Water Demand	=	22,500 (Gal/Net Ac-Day)	PG 2-2, Table 2-2
Net Acreage	=	0.8 x (Gross Area in Acres)	PG 2-2, Table 2-3
Peak Hour Demand Factor		5.3	PG 2-3, PG 2-6, Figure 2-1
Maximum Day Demand Factor		2.2	PG 2-4, PG 2-6, Figure 2-2

<u>Net Acreage</u>	=	0.8 x (Gross Area in Acres)
	=	0.8 x (20.7 Acres)
	=	16.6 Ac

<b><u>AVERAGE ANNUAL DEMAND</u></b>	=	Hospital Unit Water Demand (Gal/Net Ac-Day) x Net Acres
	=	22,500 (Gal/Net Ac-Day) x 16.6 Ac
	=	<b>373,500 gpd (or 0.6 CFS)</b>

<b><u>PEAK HOUR DEMAND</u></b>	=	Avg. Annual Demand x Peak Hour Demand Ratio
	=	5.3 x 373,500 gpd
	=	<b>1,979,550 gpd (or 3.2 CFS)</b>

<b><u>MAXIMUM DAY DEMAND</u></b>	=	Avg. Annual Demand x Peak Hour Demand Ratio
	=	2.2 x 373,500 gpd
	=	<b>821,700 gpd (or 1.32 CFS)</b>

### 2.3 Fire Demand

Fire demand is 4,000 GPM for commercial development or 6,000 GPM for industrial development. These quantities will be compared to requirements set forth in the Fire Suppression Rating Schedule.

### 2.4 Water Model

The water model requires additional information and shall be provided in a subsequent submittal.

### 3.0 Sewer

#### 3.1 Existing Conditions

There are two existing gravity sewer lines located to the south and west of the project site. To the south, an 8 inch Vitrified Clay (VC) pipe gravity sewer line follows the Ruffin Court street alignment and conveys flow westerly towards Ruffin Road. To the west, an 10 inch VC pipe conveys flow northerly from the intersection Ruffin Road and Ruffin Court to the intersection of Ruffin Road and Clairemont Mesa Boulevard. The 8 inch VC pipe and the 10 inch VC pipe joint at Manhole 13, which is located at the intersection of Ruffin Court and Ruffin Road. The 10 inch line follows the Ruffin Road street alignment and spans approximately 1,020 feet (Sewer Facilities 13-77, 77-76, 76-75 and 75-90). At Manhole 90, located at the intersection of Clairemont Mesa Boulevard and Ruffin Road, the alignment transitions from a northerly to westerly and continues down Clairemont Mesa Boulevard.

See FIGURE 1 and City of San Diego SEWER FIELD BOOK Pages H11S, H12S and I12S.

Facility No.	Upstream Manhole		Downstream Manhole		Length (ft)	Dia (in)	Material	Slope (%)	d/D	n-Value	Flow (cfs)	Flow (gpm)	Velocity (fps)
	US Manhole No.	US Invert Elev.	DS Manhole No.	DS Invert Elev.									
13-77	13	404.51	77	404.26	83	10	VC	0.30	0.5	0.013	0.60	270.6	2.21
77-76	77	404.26	76	403.55	238	10	VC	0.86	0.5	0.013	1.02	456.0	3.73
76-75	76	403.55	75	402.50	345	10	VC	1.27	0.5	0.013	1.24	554.5	4.53
75-90	75	402.5	90	401.44	355	10	VC	1.28	0.5	0.013	1.24	557.2	4.55

REFERENCE: City of San Diego SEWER FIELD BOOK (Pages: H11S, H12S, I12S)

#### 3.2 Sewer Demands

Sewer demands for the proposed development are based on requirements listed in City of San Diego Sewer Design Guide. Average day flow (ADF), maximum day and peak hour demands were obtained as shown in the tables below. As a comparison, the ADF was based on a per bed basis and requirements listed in “Wastewater Engineering” (Metcalf and Eddy, Fourth Edition). Phase I of the development will include 450 beds. Flows ranging between 175 and 400 gallons per day per bed can be expected, with a typical value of 250. In addition to the flows per bed, an employee rate of 10 gallons per minute per employee per day was included.

#### ***Sewer Design: City of San Diego Sewer Design Guide 2004***

Daily Per Capita Sewer Flow (gpd)	=	80	PG 1-6
Net Acreage	=	0.8 x (Gross Area in Acres)	PG 1-16
Hospital Max Density (DU/Net Ac)	=	42.9	PG 1-16, Table 1-1
Population/(DU)	=	3.5	PG 1-16, Table 1-2

<u>Net Acreage</u>	=	0.8 x (Gross Area in Acres)
	=	0.8 x (20.7 Acres)
	=	16.6 Ac
<u>Population</u>	=	16.6 (Net Ac) x 42.9 (DU/Net Ac) x 3.5 (Population/DU)
	=	2,493
<b><u>DESIGN FLOW</u></b>	=	Daily Per Capita Sewer Flow (gpd) x Population
	=	80 (gpd) x 2,493
	=	<b>199,500 gpd (or 0.31 cfs)</b>

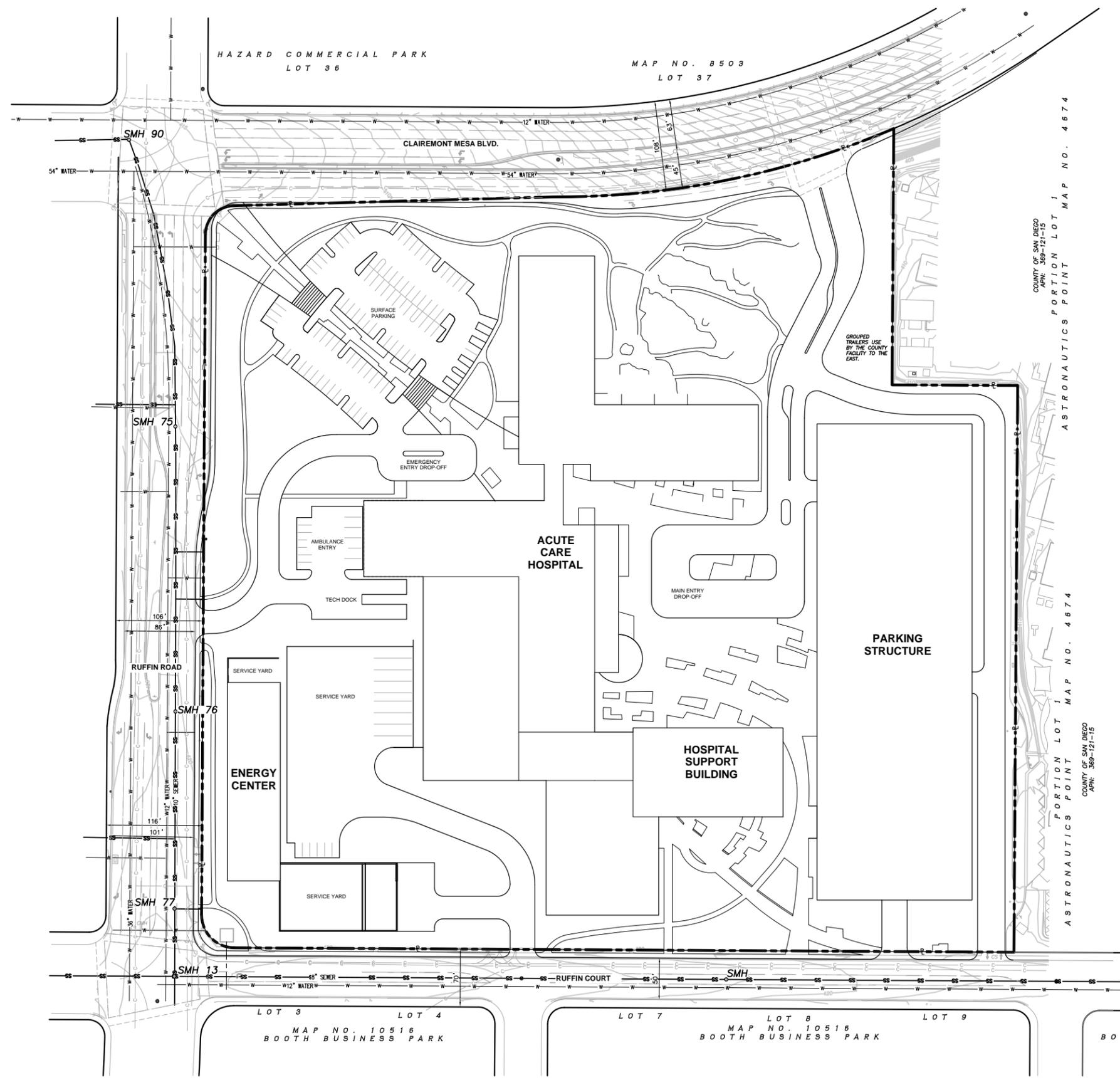
**Sewer Design: Wastewater Engineering - Treatment & Reuse 4th Ed. (Metcalf & Eddy)**

Typical Hospital Bed (gal/(unit x d))	=	250	PG 158, Table 3-3
High Hospital Bed (gal/unit x d)	=	400	PG 158, Table 3-3
Employee (gal/unit x d)	=	50	PG 158, Table 3-4
<u>Typical Hosp. + Employee Flow</u>	=	300 (gal/(unit x d)) x 450 Units	
		135,000 gpd (or 0.21 cfs)	
<u>High Hosp. + Employee Flow</u>	=	450 (gal/(unit x d)) x 450 Units	
		202,500 gpd (or 0.31 cfs)	
<b><u>DESIGN FLOW</u></b>	=	<b>202,500 gpd (or 0.31 cfs)</b>	

3.3 Sewer Model

The sewer model requires additional information and shall be provided in a subsequent submittal.

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**LEGEND**

	EXISTING
SUBDIVISION BOUNDARY	---
CURB AND GUTTER	==
EASEMENT	---
10' CONTOUR	~ 100 ~
2' CONTOUR	~ 2 ~
SEWER LINE	SS SS
WATER LINE	W W
FIRE WATER LINE	FIRE FIRE
FIRE HYDRANT	⊙
FIRE DEPARTMENT CONNECTION	⊙ FDC
WATER METER	⊞
GATE VALVE	•
SEWER MANHOLE	○

**KAISER PERMANENTE  
SAN DIEGO CENTRAL HOSPITAL  
MEDICAL CENTER**

**FIGURE 1  
EXISTING UTILITIES EXHIBIT**

WATER REFERENCE: CITY GATE PAGES H11S, 111S AND I12S.  
SEWER REFERENCE: CITY OF SAN DIEGO SEWER FIELD BOOK PAGES H11S, H12S AND I12S

