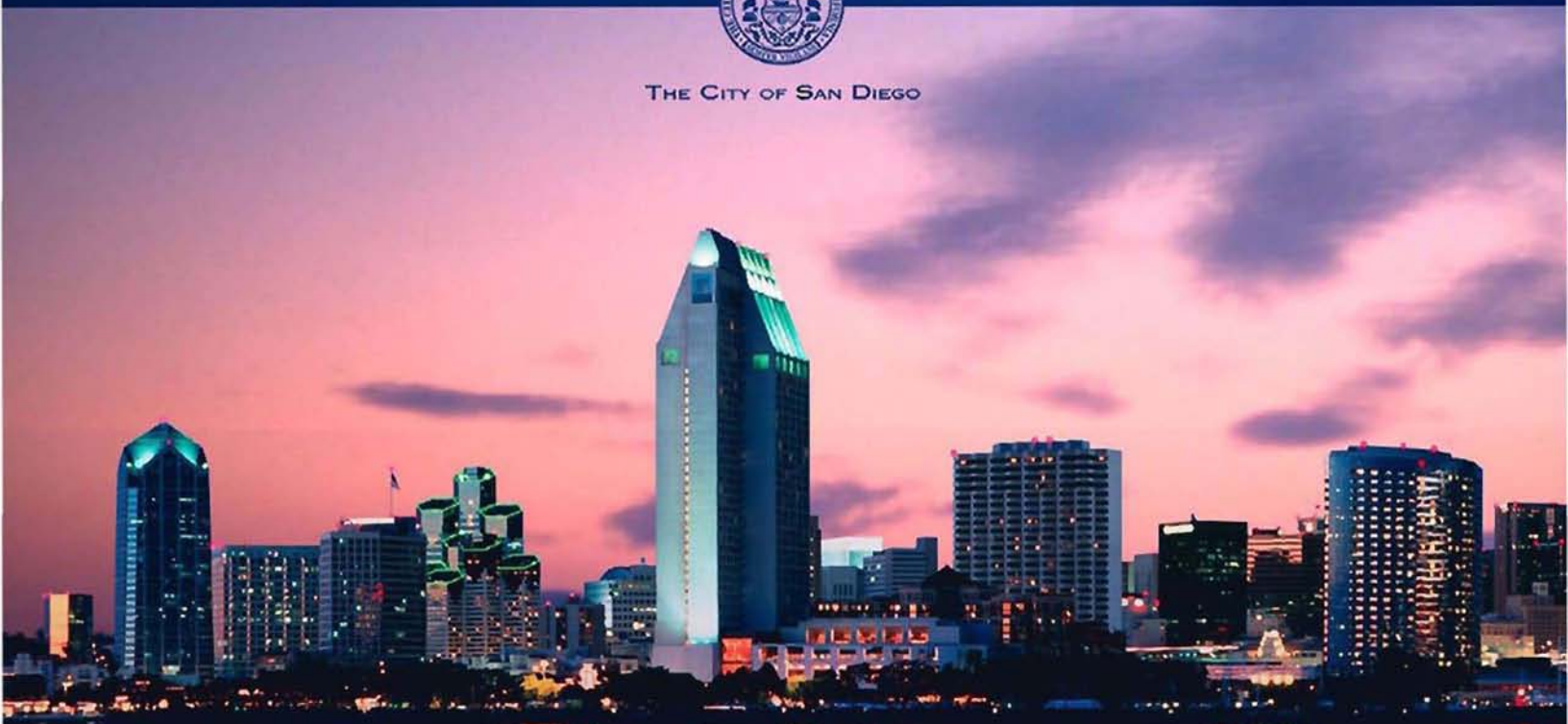
THE CITY OF SAN DIEGO



Urban Water Management Plan 2005

The 2005 City of San Diego Urban Water Management Plan

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The City of San Diego Water Conservation Program is dedicated to provide the best quality water to the citizens of San Diego…so that the public health, environment, and quality of life are enhanced.

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CITY OF SAN DIEGO
2005 URBAN WATER MANAGEMENT PLAN

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ACRONYMS AND ABBREVIATIONS

AAC	**All American Canal**
AB	**Assembly Bill**
Act	**Urban Water Management Planning Act**
AF	**Acre-Feet**
AFY	**Acre-Feet per Year**
BMP	**Best Management Practice**
CAB	**Citizen Advisory Board**
Cal-Am	**California American Water Company**
CALTRANS	**California Department of Transportation**
CC	**Coachella Canal**
CDM	**Camp, Dresser & McGee**
CIMIS	**California Irrigation Management Information Service**
CII	**Commercial, Industrial, Institutional**
CIP	**Capital Improvement Program**
City	**City of San Diego**
CLIP	**Commercial Landscape Incentive Program**
CLSP	**Commercial Landscape Survey Program**
CMUA	**California Municipal Utilities Association**
CRA	**Colorado River Aqueduct**
CUWA	**California Urban Water Agency**
CUWCC	**California Urban Water Conservation Council**
Del Mar	**City of Del Mar**
DHS	**Department of Health Services**
DMM	**Demand Management Measure**
DMP	**Drought Management Plan**
DVL	**Diamond Valley Lake**
DWR	**California Department of Water Resources**
EELCP	**Emergency Electric Load Curtailment Program**
EIR	**Environmental Impact Report**
EIS	**Environmental Impact Statement**
EOC	**Emergency Operations Center**
EOP	**Emergency Operations Plan**

EPA	**Environmental Protection Agency**
ERP	**Emergency Response Plan**
ESP	**Emergency Storage Project**
ETo	**Standard Average Evapotranspiration**
FEMA	**Federal Emergency Management Agency**
Forum	**Colorado River Basin Salinity Control Forum**
FY	**Fiscal Year**
GIS	**Geographical Information System**
GP	**General Plan**
GPD	**Gallons per Day**
GPF	**Gallons per Flush**
HCF	**Hundred Cubic Feet**
HEW	**High Efficiency clothes Washer**
IAWP	**Interim Agricultural Water Program**
IBWC	**International Boundary and Water Commission**
IID	**Imperial Irrigation District**
IPR	**Indirect Potable Reuse**
IRP	**Integrated Resources Plan**
IRPSIM	**Integrated Resources Planning SIMulation Model**
IRW-MAIN	**U.S. Army Corps of Engineers' Institute for Water Resources Municipal and Industrial Needs**
IRWMP	**Integrated Regional Water Management Plan**
lb/day	**Pounds Per Day**
Long-Range Plan	**Long-Range Water Resources Plan**
Metropolitan	**Metropolitan Water District of Southern California**
MG	**Million Gallons**
MGD	**Million Gallons per Day**
mg/l	**Milligrams per Liter**
MIRP	**Major Incident Response Plan**
MRO	**Mandatory Reuse Ordinance**
MTBE	**Methyl Tertiary Butyl Ether**
MWD-MAIN	**IRW-MAIN modified for Metropolitan's service area**
MWWD	**Metropolitan Wastewater Department**
M&I	**Municipal and Industrial**

NCWRP	**North City Water Reclamation Plant**
NOAA	**National Oceanic and Atmospheric Administration**
NR&C	**Natural Resources &Culture Committee**
OMWD	**Olivenhain Municipal Water District**
PLWTP	**Point Loma Wastewater Treatment Plant**
Plan	**Urban Water Management Plan**
ppb	**Parts Per Billion**
ppm	**Parts Per Million**
PTI	**Public Technology Incorporated**
PUAC	**Public Utility Advisory Commission**
PVID	**Palo Verde Irrigation District**
RUWMP	**Regional Urban Water Management Plan**
RWQCB	**Regional Quality Control Board**
SANDAG	**San Diego Association of Governments**
SBWRP	**South Bay Water Reclamation Plant**
SEMS	**Standardized Emergency Management System**
SDG&E	**San Diego Gas and Electric Company**
SDMC	**San Diego Municipal Code**
SDWA	**Safe Drinking Water Act**
SIP	**System Improvement Package**
SPWRP	**San Pasqual Water Reclamation Plant**
Strategic Plan	**Strategic Plan for Water Supply**
SWA	**Source Water Assessment**
SWP	**State Water Project**
TDS	**Total Dissolved Solids**
ULFT	**Ultra-Low Flush Toilet**
USBR	**U.S. Bureau of Reclamation**
UWMP	**Urban Water Management Plan**
WARN	**Water Agency Response Network**
Water Authority	**San Diego County Water Authority**
WSDM	**Water Surplus and Drought Management Plan**

EXECUTIVE SUMMARY

The City of San Diego is a thriving community located on Southern California's semi-arid coastal plain. San Diego's pleasant Mediterranean climate attracts large numbers of potential residents, businesses, and tourists every year. Known as America's Finest City, San Diego is the seventh largest City in the United States and the second largest in California with a population of approximately 1.3 million.

San Diego relies mostly upon imported water from Northern California and the Colorado River. The City currently purchases up to 90 percent of its water from San Diego County Water Authority (Water Authority), a wholesale agency that provides imported water to 23 member agencies. The Water Authority, in turn, purchases water from Metropolitan Water District of Southern California (Metropolitan), which is comprised of 26 public water agencies and is the largest in the nation. Careful water resource planning has been the cornerstone of the development of the City's *Strategic Plan for Water Supply* (Strategic Plan) and the *Long-Range Water Resources Plan* (Long-Range Plan). The City is committed to maximizing its current systems and facilities and is investigating new alternative sources of water (i.e. desalting, water transfers, groundwater storage, repurifications) that help diversify San Diego's sources of water and consequently improve water supply reliability.

The City's Water Conservation Program has been and continues to be effective in promoting permanent water savings. Established by the City Council in 1985, the Water Conservation Program now accounts for approximately 30,425 acre-feet (AF) of potable water savings each year, with passive participation the value increases to 39,513 AF. To help meet future water demand, the City is planning to continue the popular water conservation programs and introduce new programs aimed at achieving significant water savings in both indoor and outdoor water uses. Pilot programs are also being developed to investigate new technology and systems that become available to San Diegans.

Water conservation is only one component of the City's overall strategy to secure a safe and reliable water supply. The City has other programs that are either currently operating or are in research and development stages aimed at meeting this objective. The City of San Diego has built the North City Water Reclamation Plant (NCWRP) and the South Bay Water Reclamation Plant (SBWRP) to meet future water demands. These plants treat wastewater to a level that is approved for irrigation, manufacturing and other non-potable purposes. Since 1997, the City has successfully marketed and used more than 7.5 billion gallons of recycled water. Currently, over 350 meters are signed up for recycled water use; customers include the Torrey Pines Golf Course, Miramar Landfill, University of California at San Diego, CALTRANS, as well as City parks and landscape maintenance districts. By implementing water conservation measures and maximizing the use of recycled water on site, industrial customers can benefit from a program that exempts them from drought related mandatory cutbacks in potable water use. Moreover, recycled water is a local source of water not affected by droughts or other water shortages. The existing distribution system consists of 70 miles of pipeline, 2 storage tanks, and 3 pump stations.

The Water Authority also has been working hard to identify and secure additional sources of water and improve water supply reliability in the region. The Water Authority negotiated the landmark water transfer agreement with the Imperial Irrigation District (IID) for up to 200,000 acre-feet of water. Also underway is the Emergency Storage Project (ESP), scheduled to be completed in 2011 by the Water Authority. This will connect existing sources of water, allowing water to flow throughout the system even in the event a disaster disrupts the region's imported water supply. Given these regional efforts to secure more water and storage, and the City's efforts to conserve potable water, maximize the use of recycled water, and consider new alternative sources of water, the City's projected water supply through 2030 looks reasonable in meeting San Diego's future water demand.

The 2005 Urban Water Management Plan (Plan) reports the activities the City is embarking upon to secure a safe, reliable water supply for San Diego. The structure of the 2005 Plan is based upon the information required by the Urban Water Management Planning Act (Act) for the 2005 update, as coordinated by the California Department of Water Resources (DWR).

SECTION 1 - INTRODUCTION

1.1 CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT

The City of San Diego has prepared the 2005 Plan in response to the Urban Water Management Planning Act, Water Code sections 10610 through 10657, which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. The Act was known as Assembly Bill (AB) 797 while pending before the Legislature. The Act requires that "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt . . . an urban water management plan."

Further, the Act specifies that Plans be filed with the DWR at least once every five years in years ending in five and zero. In compliance with the Act, the City of San Diego filed prior Plans with the DWR in 1985, 1990, 1995, and 2000. **Appendix A** contains the text of the Act. The City's current 2005 Plan, contained in this report, is an update of the 2000 Plan and will be submitted to the DWR after approved by the San Diego City Council. This Plan update will be used by the City as a water resources planning tool to ensure the citizens of San Diego a safe and adequate water supply through the year 2030.

The Act has evolved since its passage in 1983. Since 2000, there have been substantial changes to the Act, with the most recent occurring in 2004. There are many new requirements and provisions in the Act:

- Requirement that the water purveyor of a public water system prepare a water supply assessment to be included in the environmental documentation of certain large proposed projects.
- Requirement for affirmative written verification from the water purveyor of a public water system that sufficient water supplies are available for certain large residential subdivisions of property prior to approval of a tentative map.
- Requirement for a description of water management tools in the plan that maximizes resources and minimizes imported water supplies.
- Requirement to notify all cities and counties within service area that a plan or amendment to the plan is being prepared.
- Requirement for additional information if groundwater is identified as an existing or planned water source.
- Requirement to describe specific water supply projects, programs, and implementation schedules to meet projected demands over the 20-year planning horizon.
- Requirement to describe opportunities for development of desalinated water as a long term supply.
- Requirement for data sharing between suppliers and wholesale agencies and a provision allowing suppliers to rely on information provided by wholesaler.
- Provision allowing DWR to take into consideration a water supplier’s implementation plans and achievements for water conservation when evaluating application for grants and loans.

- Requirement to discuss recycled water opportunities.
- Requirement to describe water quality over a 20-year horizon and the manner in which quality affects management strategies and supply reliability.
- Requirement to notify all cities and counties within the service area of the time and place of the public hearing on plan adoption.
- Requirement to file plan or plan amendment with all cities and counties within service area.
- Requirements that DWR make a supplier ineligible to receive Prop 204 or Prop 13 funding if supplier does not comply with the Act.

1.2 CITY OF SAN DIEGO'S 2005 URBAN WATER MANAGEMENT PLAN

The City of San Diego's 2005 Urban Water Management Plan is an update of the 2000 Plan. The intention of this Plan is to demonstrate the City's reliability over the next 25 years. In order to prepare the 2005 Plan, an Urban Water Management Task Force was formed. The Task Force comprised of staff members from the City, each staff member representing a specific section of the Plan. The purpose of this group was to provide a forum to manage the development process of the Plan.

In order to ensure consistency between the suppliers (Metropolitan and the Water Authority) and the City, meetings were held by Metropolitan and the Water Authority in order to discuss demand and supply information. Along with attending meetings held by Metropolitan and the Water Authority, the City attended a workshop hosted by DWR and the California Urban Water Conservation Council (CUWCC) which reviewed the DWR guidelines and requirements for the Act.

In accordance with the Act and also to encourage involvement of the public and community groups, the City held a public hearing on October 17, 2005 at the City's Public Utilities Advisory Commission (PUAC) meeting. Proof of this public hearing is provided in **Appendix B**. At this meeting PUAC voted in favor of approving the City's Draft 2005 Plan, with comments, in order for the Plan to progress forward and go before the Natural Resource and Culture Committee (NR&C). After approval by NR&C to move the revised Plan forward on January 18, 2006, the City's 2005 Plan went before the San Diego City Council at one of its regularly scheduled meetings where it was considered for adoption. After the 2005 Plan was approved for adoption by the City Council, on September 11, 2006, it was submitted to DWR. **Appendix C** contains a copy of the resolution adopting the 2005 Plan.

DWR has provided a checklist of the items that must be addressed in each Plan based upon the Act. This checklist makes it simple to identify exactly where in the Plan each item has been addressed. The City of San Diego has completed the checklist, provided in **Appendix D,** which references the sections and page numbers where the specific items can be found.

1.3 CITY OF SAN DIEGO WATER DEPARTMENT

1.3.1 History

The history of the City of San Diego's water supply indicates that water surpluses are rare. Therefore, constant attention to water conservation and management programs is required. San Diego was founded as a Spanish community by Father Junipero Serra and the Franciscan Friars in 1769. Established as the first mission site in the state, Father Serra and the Friars built the region's first drainage ditches, wells, and a dam situated on the San Diego River.

The City of San Diego was incorporated in 1850, and became a charter city in 1889, pursuant to the California Constitution and the California Government Code. Municipal ownership of the City's water supply and distribution system began in 1901, with the purchase, for $40 million, of the privately owned San Diego Water Company. By 1947, the City's publicly owned water supply system extended to dams, water rights, distribution lines, and associated facilities.

The expansion of the City's water supply system occurred in four phases over a period of 30 years. The first phase involved the acquisition of existing reservoir systems and dams, including Lower and Upper Otay in 1913, and Morena Dam in 1914. Phases two and three consisted of purchasing Lake Hodges and the San Dieguito Dam in 1925, and the construction of El Capitan Dam in 1935.

The fourth and final expansion phase was the result of a wartime population (WWII) of more than 400,000 people constituting a demand well above the system's safe yield. As a result of this supply deficiency, the Navy requested that the City connect to the Colorado River Aqueduct (CRA), which was completed by Metropolitan in 1941. The Water Authority was formed in 1944, and joined Metropolitan in 1946, in order to economically import Colorado River water to the San Diego region. The San Diego Aqueduct, completed in 1947, became the region's first link to Metropolitan's CRA. Thus began the City's reliance upon imported water, which now constitutes up to 90 percent of its supply.

1.3.2 Water Supply Delivery System

The City of San Diego purchases much of its water from the Water Authority and Metropolitan. A 242 mile-long aqueduct brings Colorado River water from Lake Havasu to the Southland. The City also receives water originating in Northern California from the State Water Project (SWP). This water is captured in reservoirs north of Sacramento and released through natural rivers and streams into the Sacramento-San Joaquin Delta. The water is delivered to southern California through a 444 mile-long aqueduct. Metropolitan blends Colorado River and SWP water at a facility in Riverside County, and then transfers it to San Diego water treatment plants.

The Water Department treats and delivers more than 200,000 acre feet per year (AFY) of water to its residents. Its service area is generally located within the south central portion of San Diego County and is approximately 330 square miles. The water system consists of nine raw water storage facilities: Barrett, El Capitan, Hodges, Miramar, Morena, Murray, Otay, San Vicente, and Sutherland, eight of which are directly connected to water treatment operations. These reservoirs capture local rainwater and runoff to supply up to 20 percent of the City’s water.

Also, the Water Department maintains and operates three water treatment plants with a combined total treated capacity of 294 million gallons per day (MGD). The Miramar Water Treatment Plant, originally constructed in 1962, has a rated capacity of 140 MGD. The Alvarado Water Treatment Plant, operational since 1951, recently increased the rated capacity to 150 MGD. The Otay Water Treatment Plant was originally constructed in 1940 and has a current capacity of 34 MGD.

The Department maintains and operates 32 treated water storage facilities, including steel tanks, standpipes, concrete tanks and rectangular concrete reservoirs, with capacities varying from less than 1 million gallons (MG) to 35 MG. The water system consists of approximately 3,460 miles of pipeline, including transmission lines up to 84 inches in diameter and distribution lines as small as 4 inches in diameter.

Along with the potable water supply, the City of San Diego built the NCWRP and the SBWRP to treat wastewater to a level that is approved for irrigation, manufacturing and other non-drinking, or non-potable purposes. The NCWRP has the capability to treat 30 MGD of sewage and the SBWRP can treat 15 MGD. The Water Department maintains and operates the recycled water distribution system. It consists of 66 miles of recycled water pipeline, a 9 MG reservoir and two pump stations. The pipeline sizes vary from 4-inches to 36-inches in diameter.

1.4 SERVICE AREA INFORMATION

Demographic factors such as population, housing, employment, and climate to name a few, are taken into account when associating water use within the City of San Diego. With more than 1.3 million people, San Diego is the seventh largest city in the United States and the second largest in California. More than 100 languages are spoken by San Diego residents who have come from all parts of the world to live here. San Diego also has a young population, with approximately 56 percent of its citizens under 35 years old.

1.4.1 Population Data

The data presented below are from San Diego Association of Governments' (SANDAG) latest projection, *The 2030 Regional Growth Forecast*, November 2003. These data span the years 2005 to 2030 in five year increments. It shows that the City of San Diego's population is expected to increase from about 1.3 million to almost 1.7 million in 2030. The growth rate for the incremental years is predicted to be 28 percent. The population projections for this 2005 Plan are less then the projections from the previous 2000 Plan. An explanation for this reduction is that current trends show more people are moving to Riverside County.

TABLE 1-1
CITY OF SAN DIEGO POPULATION
CURRENT AND PROJECTED
(SANDAG)

	2005	2010	2015	2020	2025	2030
Service Area Population	1,314,803	1,369,087	1,447,271	1,506,520	1,575,297	1,655,505

1.4.2 Housing Data

Moreover, the housing trend has increasingly grown since 2000. SANDAG is forecasting the overall occupied housing growth rate for the years 2000 to 2030 to be 23 percent, representing the residential category. An increase in overall water consumption is therefore predicted to be in response to the increase in the number of occupied housing units.

In the City of San Diego, the residential category is divided into the single family and multi-family dwelling units. These residential units are divided into these two sub-categories simply because their demand for water will vary, as well as the rate of their growth patterns. As shown in the Regional Growth Forecast table which follows, it is expected for single family units to have an increase of five percent by 2030, whereas, multi-family units will have an overwhelming increase of 47 percent. By 2025, multi- family units will have surpassed the single family category by 4,000 units.

Another variable used in the water demand calculations is housing density. More housing units per acre meant that there is less area available for outdoor water use. Housing density is calculated by dividing occupied housing units by developed acreage for single family and multi-family dwelling units, respectively. The housing density trend for the City as a whole from 2000 through 2030 is a reduction of four percent in the single family sub-category and an increase in 24 percent in the multi-family sub-category.

TABLE 1-2
SANDAG 2030 REGIONAL GROWTH FORECAST
CITY OF SAN DIEGO
(HOUSING AND EMPLOYMENT)

CHARACTERISTICS	**YEARS**							
	2000	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**Growth Rate**
Total Occupied Housing Units	**450,634**	**475,156**	**498,617**	**518,357**	**531,694**	**559,648**	**579,788**	**23%**
Single Family	256,676	265,692	269,181	273,652	275,599	277,703	276,523	5%
Multi-family	193,958	209,464	229,436	244,705	256,094	281,945	303,265	47%
Housing Density*								
Single Family	7.13	6.87	6.77	6.75	6.71	6.71	6.71	-4%
Multi-family	19.26	19.71	20.83	21.42	21.98	23.26	24.32	24%
Total Employment	**775,624**	**817,876**	**864,052**	**907,562**	**929,916**	**949,802**	**973,937**	**20%**
Military	34,365	34,365	34,365	34,365	34,365	34,365	34,365	0%
Civilian	741,259	783,511	829,686	873,196	895,550	915,437	939,571	21%
Agriculture	1,763	1,703	1,681	1,672	1,616	1,623	1,623	-5%
Construction	24,725	28,366	27,971	28,011	28,104	26,530	26,931	-3%
Manufacturing	74,098	66,669	67,479	67,566	67,594	67,791	68,028	0%
Transp., Commun. & Util.	36,204	36,944	39,755	41,707	42,511	43,906	45,873	25%
Wholesale trade	28,760	28,854	31,932	34,747	35,745	37,094	38,459	33%
Retail trade	110,000	117,091	120,692	126,139	128,884	131,819	134,215	16%
Finance, Insurance, Real Estate	48,492	51,956	57,400	61,821	64,210	66,102	67,744	32%
Services	257,585	276,567	297,152	319,791	330,430	340,627	352,514	29%
Government	129,544	144,048	152,256	156,940	160,890	163,735	166,994	18%
Self Employed & domestics	30,089	31,313	33,369	34,803	35,567	36,210	37,190	20%
Median household income**	**48.960**	**48.877**	**50.469**	**53.788**	**58.235**	**61.749**	**66.795**	**36%**

* Housing Density was derived by dividing total housing units by associated acres.
**Household Income was derived from SANDAG data of number of housing units by income range.

1.4.3 Median Household Income

Median household income corresponds to the consumer's ability to pay for their water usage. The data was provided by SANDAG for the years of 2000 to 2030, in five-year increments. As it appears, a 36 percent increase in household income is predicted to occur by 2030. Median household income in 2000 was recorded at $47,500, to increase by 36 percent, or $17,100.

1.4.4 Employment Data

Future employment is used to correspond to the growth for the non-residential categories, which also is the variable that is used to determine non-residential water demand projections. As displayed in the Regional Growth Forecast table above, the employment data are broken up in the following categories: Military; Civilian; Agriculture; Construction; Manufacturing; Transportation, Communication and Utilities; Wholesale Trade; Retail Trade; Finance, Insurance and Real Estate; Services; and Self Employed and Domestics, for the years 2000 to 2030. By far, the Civilian category is markedly the largest category of all 12 employments listed by SANDAG. However, by 2030, the Wholesale Trade category will have the greatest increase in growth, which is projected at 33 percent, followed by Finance, Insurance, and Real Estate at 32 percent increase.

1.4.5 Climate Data

The City of San Diego's climatic conditions are characterized as Mediterranean, with warm, mild winters and cool, dry summers. The service area is semi-arid with little rain occurring throughout the year. The average rainfall is around 10 inches annually. More than 80 percent of the region's rainfall occurs in the period of November thru March with January, on average, receiving the most rainfall. Approximately 10 percent of the total seasonal rainfall normally occurs from May to October and only roughly 2 percent occurs during the three-month period from June through August. **Figure 1-1** illustrates the City of San Diego's annual rainfall from 1971 until 2005.

FIGURE 1-1 (Lindbergh Field Station)

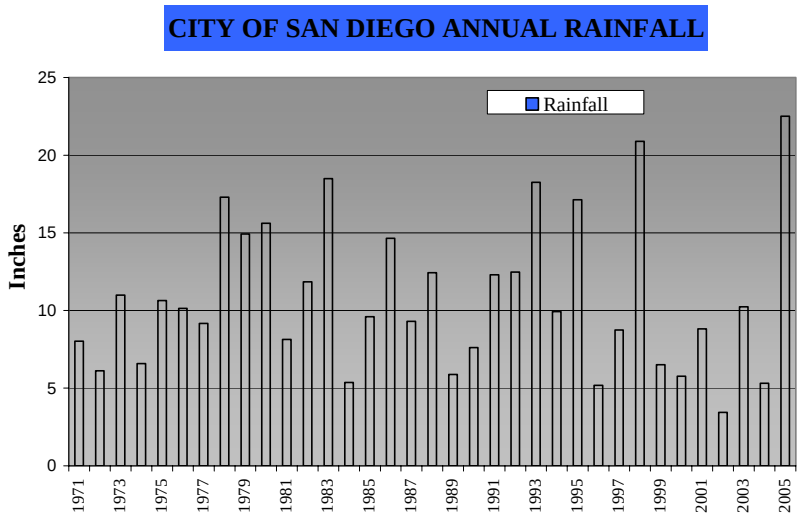


Figure 1-2 shows the City of San Diego's Average Climate over a 30 year period, beginning in 1971. This includes both precipitation and temperature.

FIGURE 1-2 (Lindbergh Field Station)

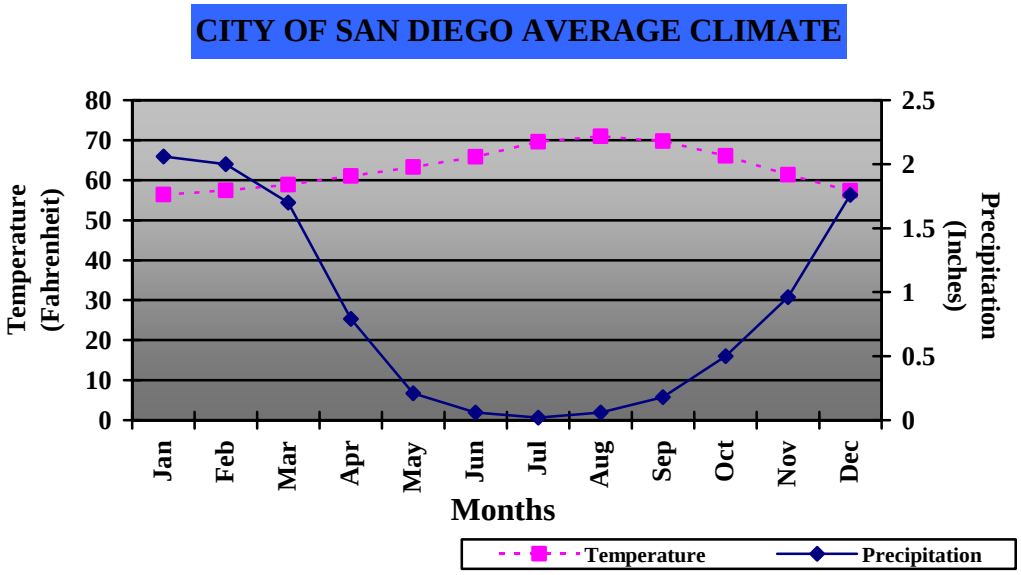


TABLE 1-3
CITY OF SAN DIEGO
CLIMATE DATA OVER 30 YEAR PERIOD

	January	February	March	April	May	June
Standard Average* Evapotranspiration (ETo)	2.07	2.42	3.44	4.61	5.07	5.33
Average Rainfall (inches)	2.03	1.96	1.69	0.79	0.21	0.06
Average Temperature (F)	56.35	57.43	58.85	61.05	63.30	65.83

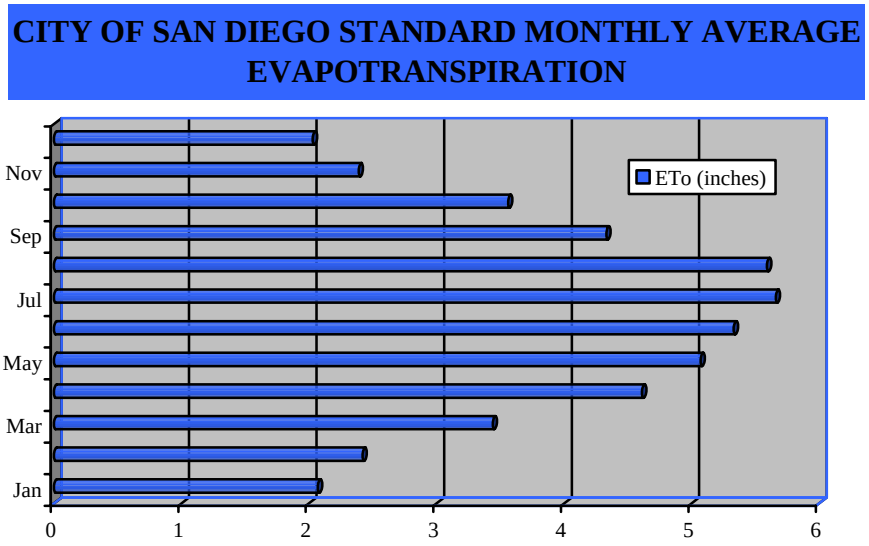
	July	August	September	October	November	December
Standard Average* Evapotranspiration	5.66	5.59	4.33	3.56	2.39	2.03
Average Rainfall (inches)	0.02	0.06	0.18	0.50	0.96	1.76
Average Temperature (F)	69.57	70.96	69.78	66.08	61.37	57.30

	Annual
Standard Average* Evapotranspiration	**46.5**
Average Rainfall (inches)	**10.22**
Average Temperature (F)	**63.16**

*Standard average evapotranspiration data was collected over a 20 year period beginning in 1985

Figure 1-3 shows the City of San Diego's standard monthly average evapotranspiration from 1985 until 2005. Evapotranspiration is the loss of water to the atmosphere by the combined process of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). An indicator of how much water vegetation needs for healthy growth and productivity.

FIGURE 1-3 (Balboa Park CIMIS Station #184)



The weather variations affect water management, causing a demand, which increases during the hot, dry periods and a decline in water use during the wet periods. Water requirements tend to increase during the summer months when a decrease in rainfall combines with an increase in temperature and an increase in evapotranspiration levels.

The climate data was obtained from both the National Oceanic and Atmospheric Administration (NOAA) (http://www.wrcc.dri.edu/CLIMATEDATA.html) and the California Irrigation Management Information System (CIMIS) (http://www.cimis.water.ca.gov/cimis/welcome.jsp) websites.

SECTION 2 - WATER SOURCES

The City of San Diego currently purchases approximately 75-90 percent of its water from the Water Authority which supplies the water (raw and treated) through two aqueducts consisting of five pipelines. While the City imports a majority of its water, it uses three local supply sources to meet or offset potable demands: local surface water (**Section 2.1**), conservation (**Section 2.5**) and recycled water (**Section 5**).

2.1 WATER SOURCES

Imported Supplies

The City is located in a semi-arid coastal desert environment, averaging ten inches of rain annually. The City purchases its water from the Water Authority, who in turn purchases it from Metropolitan. A 242 mile-long aqueduct brings Colorado River water from Lake Havasu to the Southland. The City also receives water originating in Northern California from the SWP. The 444 mile-long California Aqueduct carries the water from south of the Delta to State Water Project contractors throughout the state, such as Metropolitan.

Metropolitan blends raw Colorado River and SWP water at a facility in Riverside County, transferring it to City water treatment plants (Miramar, Alvarado, and Otay) or City reservoirs via pipelines operated by Metropolitan and the Water Authority. Approximately ten to twenty five percent of San Diego's water is of local origin, collected as runoff in the City's reservoirs. The City is, therefore, heavily dependent upon imported water, and depends upon imported water from the Water Authority and Metropolitan. A small portion of the City's imported water is treated imported water, from Metropolitan's Lake Skinner Treatment Plant in Rancho California.

The City has been receiving water from the Water Authority since 1947 and during the last 20 years the City has purchased between 100,000 and 228,000 AF of water per year. For Fiscal Year 2005, water purchases totaled approximately 211,000 AF, representing 87 percent of the City’s total water needs.

Local Surface Water Supplies

The City of San Diego's water system consists of nine local surface water reservoirs with more than 410,000 AF of capacity, eight of which are connected directly or indirectly to water treatment plants. The City's Hodges Reservoir is currently not connected to the City's water supply system, but will be connected by 2008. The City's reservoir system also operates in combination with the imported water system.

Use of local water by the City to meet water demand is affected by availability (weather), and water resource management policies. The City operates its reservoir system to maximize use of local water in conjunction with imported water programs. The City also operates to store emergency water and seasonal imported water through storage programs. Historically, the City's

median annual local water use is about 27,200 AF. This is expected to increase to about 29,000 AF once Hodges Reservoir is connected to the water supply system.

While the City reservoirs capture local runoff, they also provide for emergency water storage. The purpose of emergency storage is to increase water supply reliability during an interruption of supply from the imported water aqueduct system. This is accomplished by maintaining a sufficient amount of water in accessible storage to ensure a supply of water to water treatment plants and customers should earthquakes or other events interrupt the supply of imported water. The management of reservoirs is guided by San Diego City Council Policy #400-04 (**Appendix E**), which outlines the City's Emergency Storage Policy. The policy mandates that the City store sufficient water in active, available storage to meet the upcoming six-tenths of the annual (7.2 months) City normal water demands. The emergency storage requirement changes from month to month and thus results in a seasonally fluctuating emergency storage requirement generally peaking in May and reaching its minimum in October. This fluctuating requirement makes a portion of the storage capacity available for impounding imported seasonal storage. Emergency storage is accounted for at Lake Skinner (a Metropolitan reservoir) and several City of San Diego reservoirs (San Vicente, El Capitan, Lower Otay, Murray, and Miramar). In addition, the City has made substantial investments in the Water Authority's ESP (90,000 AF) and Metropolitan's Diamond Valley Reservoir (800,000 AF) through water rates and charges paid by the City to those agencies.

The purpose of imported seasonal storage is to increase water supply reliability. This is done by locally storing surplus imported water in the fall and winter season for use during the spring and 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 for summer use. In addition to increased imported water yield, this type of seasonal operation also reduces summer peaking on the imported raw water delivery system.

The table below shows the City's surface water storage reservoirs and their capacities.

TABLE 2-1
CITY OWNED RESERVOIRS

RESERVOIR	CAPACITY (AF)
Barrett	37,947
El Capitan	112,807
Hodges	33,550
Lower Otay	49,510
Miramar	7,185
Morena	50,207
Murray	4,818
San Vicente	90,230
Sutherland	29,685
TOTAL CAPACITY	**415,939**

Summary of Water Sources

The table below summarizes the current and planned water sources the City is relying on to meet future demands.

TABLE 2-2
PLANNED WATER SUPPLY SOURCES
(AF YEAR)

Water Supply Sources	2010	2015	2020	2025	2030
San Diego County Water Authority (Purchased)	201,901	205,178	212,260	222,238	231,725
Local Surface Water	29,000	29,000	29,000	29,000	29,000
Recycled Water	8,525	12,200	15,200	15,200	15,200
TOTAL	**239,426**	**246,378**	**256,460**	**266,438**	**275,925**

2.2 RELIABILITY OF SUPPLY

Providing reliable and sufficient water supplies upon demand has been a constant challenge for San Diegans since the late 1800's. Planners have addressed the water supply challenge with a variety of strategies including:

- Conservation and Peak Management Programs
- Storage
- Water Transfers
- Local Supplies

2.2.1 Conservation

Using water efficiently is a core strategy and ethic in San Diego. Our geography provides limited natural local supplies in the form of either rainwater or groundwater. Water conservation is the least expensive option the City has in its water supply portfolio. Long-term water savings have been accomplished with the retrofit of devices such as ultra-low flush toilets and low-flow showerheads. For a more detailed description of the City's conservation programs, see **Section 2.5**. Additionally, the Water Authority has undertaken a conservation program to line sections of both the All-American and Coachella canals in Imperial county that will result in nearly 78,000 AFY of saved Colorado River water that otherwise would seep into the ground.

2.2.2 Storage

The City uses some of its reservoirs to capture and store rainwater and imported water supplies. The City is working closely with the Water Authority and other water agencies in the county to expand and optimize storage opportunities. The Water Authority recently completed construction of the Olivenhain Dam which adds 24,000 AF of stored water available to its member agencies in times of emergency such as an earthquake. Additionally, Metropolitan has successfully increased its storage capabilities ten-fold since the early 1990's. Most notably, Metropolitan recently completed construction of the Diamond Valley Lake (DVL) located near Hemet California. DVL is capable of storing up to 800,000 AF of imported water during wet years that can be drawn upon during dry years. Storage programs are very effective at balancing water supply availability between wet and dry year periods.

2.2.3 Water Transfers

Water transfers are defined as voluntary, market-based exchanges of water from willing sellers to willing buyers. It is estimated that agriculture uses 80 percent of California's water supply while urban customers use 20 percent. During the past decades, several landmark long-term water transfers from agriculture to urban customers have been accomplished that are considered beneficial to both parties. In 2003, the IID formally agreed to sell conserved water to the Water Authority. This is a 75-year agreement that will, over time, provide 200,000 AF of water to the Water Authority and its member agencies.

Additionally, Metropolitan has established a formal water transfer agreement with the Palo Verde Irrigation District (PVID) to transfer varying amounts of Colorado River water to Metropolitan as part of a voluntary fallowing program offered to PVID customers. Metropolitan also has pioneered various spot market water transfers with farmers in California's Central Valley during dry years. The Water Authority (and the City) may also pursue spot market water transfers during dry years independently of Metropolitan, however, doing so would require paying wheeling costs to Metropolitan (and the Water Authority). The cost would be justified by the increased reliability that would be attained.

2.2.4 Local Supplies

In terms of local supplies or those directly in the control of the City, the City in 2002, adopted the *Long-Range Water Resources Plan (2002-2030)* which provided a decision-making framework for evaluating water supply options. The Long-Range Plan identified water conservation, water recycling, groundwater desalination, groundwater storage, ocean desalination, marine transport, water transfers, and imported supply from the Water Authority and Metropolitan as potential near term and long term supplies. Based on the short term recommendations of the Long-Range Plan the City is increasing conservation and recycled water use and is exploring new alternative sources of water, including seawater and brackish water desalination, groundwater and water transfers. With this the City continues to try to reduce its reliability on imported water from the Water Authority and Metropolitan.

2.2.5 Vulnerability of Water Supply

As stated above, the City presently relies upon imported water to supply a majority of its annual water supply (higher during times of drought). Each of the water supply sources that the City depends on to meet water demands; imported water, local surface water, and recycled water; could be vulnerable to legal, environmental, water quality or climatic uncertainties (inconsistency of supply).

In order to offset vulnerability, namely climatic, the City continues aggressive water recycling and conservation programs to create additional dependable water supply sources, and to forestall potential future water shortages. Furthermore the City relies upon the Water Authority and Metropolitan to develop additional sources of water and storage for increased reliability.

The following two tables show the City's local supplies for single and multiple dry-year supply reliability and the basis for water year data. As defined by the DWR Guide Book, the single dry-year is generally considered to be the lowest annual runoff for a watershed since the water-year beginning in 1903. The multiple dry-year period is considered to be the lowest average runoff for a consecutive multiple year period (three years or more) for a watershed since 1903. For this analysis available data from 1948 to 2005 was used.

TABLE 2-3
SUPPLY RELIABILITY
(AF Year)

Average / Normal Water Year	Single Dry - Year	Multiple Dry Water Years				
		Year 1	Year 2	Year 3	Year 4	Year 5
Local Surface Water	4,500	7,500	8,100	5,900	4,500	4,900
% of normal *	15	26	28	20	15	17
Recycled Water ** (Starting 2005)	4,120	4,120	4,120	4,120	4,120	4,120
Recycled Water ** (Starting 2010)	8,525	8,525	8,525	8,525	8,525	8,525
Recycled Water ** (Starting 2015)	12,200	12,200	12,200	12,200	12,200	12,200
Recycled Water ** (Starting 2020)	15,200	15,200	15,200	15,200	15,200	15,200

* Assumes a normal year of 29,000 AF
** No impacts to supply are expected

TABLE 2-4
BASIS OF WATER YEAR DATA

Water Year Type	Local Surface Water	Recycled Water *
Normal Water Year	1978	-
Single Dry Water Year	1963	-
Multiple Dry Water Years	1960-1964	-

* No impacts to supply are expected; see Table 2-3 for supply quantities

The following table shows the City's local supplies and the factors that may result in inconsistency of supply. For recycled water no inconsistency in supply is expected. For imported water inconsistencies see the Water Authority's and Metropolitan's 2005 Plan.

TABLE 2-5
FACTORS RESULTING IN INCONSISTENCY OF SUPPLY

Name of Supply	Legal	Environmental	Water Quality	Climatic
Local Surface Water				X
Recycled Water				

In order to replace reduced local surface water the City could increase its recycled water use, conservation, purchases of imported water, or any other sources that the City is pursuing, but not relying on for this 2005 Plan. For this report it is assumed that the City would increase imported water to meet any shortfalls.

2.3 TRANSFER AND EXCHANGE OPPORTUNITIES

Water transfers are agreements in which water supplies are transferred from the original point of origin or control to a new place of use. Transfers can offer flexibility and help ensure that the state's water resources are used effectively. There are a myriad of rules surrounding transfers in California, and presently water transfers are not considered as a supply resource for the City of San Diego's 2005 Plan to meet projected demands. However, the Water Department continues to seek water transfer opportunities.

2.4 WATER USE BY CUSTOMER-TYPE

The following table shows past and current water sales, and projected water demands. The table breaks down the sales (2000 and 2005) and projected demands (2010, 2015, 2020, 2025 & 2030) into sectors taken from the DWR Guidebook. In order to determine the projected sector water demands, a factor had to be applied to the total water demand number provided by the Water Authority (the Water Authority's model did not break down agency demands into sectors, see **Section 7**). Using City water sales from the past five years, an average sector factor (percentage of total use) was calculated. For example from 2000 to 2005, the Single Family sector used an average of 37.3% (approximate) of the total water sales. Using the total projected demand for 2010, 207,436 AF and multiplying it by 37.3% results in a Single Family projected demand of 77,398 AF. This method of calculation was applied to the rest of the sectors for projected water demands in the table. In addition to the sector demands, actual accounts are shown for 2000 and 2005. Total accounts were projected by reviewing existing population and account information and then estimated by examining SANDAG's population projections. Due to the complexity of SANDAG's regional growth forecast data, accounts by sector were not projected.

TABLE 2-5
PAST, CURRENT, AND PROJECTED WATER DELIVERIES
(AF YEAR)

Sector	Fiscal 2000 (Actual)		Fiscal 2005 (Actual)		2010		2015	
	Metered		Metered		Metered		Metered	
Water Use by Sector	# of accounts	Deliveries (AFY)	# of accounts	Deliveries (AFY)	# of accounts	Deliveries (AFY)	# of accounts	Deliveries (AFY)
Single Family	208,377	77,801	217,893	76,529		77,398		78,899
Multi Family	27,832	41,729	28,102	40,271		41,781		42,591
Commercial	15,381	38,694	15,300	35,277		37,118		37,838
Industrial	356	4,350	247	3,617		3,714		3,786
Institutional 1*	1,392	14,487	1,845	10,905		11,648		11,874
Institutional 2**	1,715	13,528	1,822	11,596		13,070		13,324
Landscape	4,550	21,334	5,254	20,882		21,618		22,037
Other (Outside City)	57	1,124	57	1,383		1,088		1,109
TOTAL	**259,666**	**213,047**	**270,526**	**200,460**	**277,700**	**207,436**	**289,500**	**211,458**

* Military, University, and School
** City, Public, and Government

Sector	2020		2025		2030	
	Metered		Metered		Metered	
Water Use by Sector	# of accounts	Deliveries (AFY)	# of accounts	Deliveries (AFY)	# of accounts	Deliveries (AFY)
Single Family		80,923		84,400		87,702
Multi Family		43,684		45,561		47,343
Commercial		38,808		40,476		42,059
Industrial		3,883		4,050		4,208
Institutional 1*		12,179		12,702		13,199
Institutional 2**		13,666		14,253		14,810
Landscape		22,603		23,574		24,496
Other		1,137		1,186		1,233
TOTAL	**297,100**	**216,882**	**306,500**	**226,201**	**317,800**	**235,050**

* Military, University, and School
** City, Public, and Government

2.4.1 Sales to Other Agencies

Potable

In addition to the water use shown in **Table 2-5**, the City, through past agreements, sells water to two other companies/agencies: the California American Water Company (Cal-Am), and the City of Del Mar (Del Mar). Per the agreement between the City and Cal-Am, 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-American. Per the agreement between the City and Del Mar, the City takes deliveries of water, which Del Mar purchases from the Water Authority, through the Second Aqueduct Connection at Miramar. This water is then treated at the City's Miramar Water Treatment Plant and transported along certain points to Del Mar.

Their past and current water sales uses (2000 and 2005) are shown in the table below while projected demands are based on information provided to the City by Cal-Am and Del Mar.

TABLE 2-6
SALES TO OTHER AGENCIES-POTABLE
(AF YEAR)

Potable Water Distributed	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Cal American	13,700	11,620	13,170	12,125	13,350	13,580	13,810
Del Mar	1,556	1,301	1,417	1,494	1,533	1,572	1,561
TOTAL	**15,256**	**12,921**	**14,587**	**13,619**	**14,883**	**15,152**	**15,371**

Recycled

The City has three separate agreements to sell recycled water. Olivenhain Municipal Water District and the City of Poway would be provided recycled water from the City's North City Water Reclamation Plant while Otay Water District would receive recycled water from the City's South Bay Water Reclamation Plant. Their respective projections for 2010 thru 2030 are shown in **Table 2-7** and were taken from the Water Authority's 2005 Plan.

TABLE 2-7
SALES TO OTHER AGENCIES-RECYCLED
(AF YEAR)

Recycled Water Distributed	2000	2005	2010	2015	2020	2025	2030
Olivenhain	-	-	400	100	100	100	100
Poway	280	375	425	425	425	425	425
Otay	-	-	2,584	3,228	3,974	4,838	5,840
TOTAL	**280**	**375**	**3,409**	**3,753**	**4,499**	**5,363**	**6,365**

* These projections are not included as part of the City's overall demands.

Lastly, **Table 2-8** shows the City's additional water uses (recycled water) and losses. The City's past and current recycled use is shown for 2000 and 2005 with projected use shown for 2010 thru 2030. Losses were calculated by multiplying the total water use by 4.3%. The factor was calculated by averaging the annual losses from 1998 to 2004.

TABLE 2-8
ADDITIONAL WATER USES AND LOSSES
(AF YEAR)

Water Use	2000	2005	2010	2015	2020	2025	2030
Recycled	3,250	4,294	8,525	12,200	15,200	15,200	15,200
System losses	10,404	9,781	10,295	10,594	11,028	11,457	11,865
TOTAL	**13,654**	**14,075**	**18,820**	**22,794**	**26,228**	**26,657**	**27,065**

The above tables are summarized in **Table 2-9**, below. Shown is the City's past and current use for 2000 and 2005, with projected use shown for 2010 thru 2030. Projections correlate with those provided by the Water Authority.

TABLE 2-9
TOTAL WATER USE
(AF YEAR)

Water Use	2000	2005	2010	2015	2020	2025	2030
TOTAL of Tables 2-5, 2-6 & 2-8	**241,957**	**227,456**	**239,426**	**246,378**	**256,460**	**266,438**	**275,925**

* Does not include demands from Del Mar since their demands are accounted for by the Water Authority.

2.5 DEMAND MANAGEMENT MEASURES (DMM)

In 1985, the San Diego City Council officially established the City's Water Conservation Program, to reduce San Diego's dependency upon imported water. Today, the Water Conservation Program directly accounts for approximately 30,000 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.

Table 3-1 (Section 3) Provides a summary of the City of San Diego's progress in the implementation of the DMM's.

Long-Range Goals

The City of San Diego Long-Range Water Resources Plan (2002 – 2030) was adopted by the San Diego City Council on December 9, 2002. This plan built on the previously approved 1997 *Strategic Plan for Water Supply*. The Strategic Plan set water conservation goals of 26,000 AF of water saved by 2005 and the Long-Range Plan set water savings goals of 32,000 AF by 2010; 36,000 AF by 2020 and 46,000 AF by 2030. One AF of water equals 325,851 gallons or enough water to cover an area of land about the size of a football field one foot deep. Depending on water use, one AF of water can supply two average California homes with a year's worth of water for all indoor and outdoor needs.

2.5.1 Recent Efforts in Water Conservation

In recent years, the Water Conservation Program developed or initiated the implementation of several innovative and entrepreneurial techniques in water conservation and garnered several awards.

California Municipal Utilities Association (CMUA) Award

The CMUA recently honored the San Diego Water Department's Water Conservation Program with the Community Service/Resource Efficiency Award. The Water Conservation Program was recognized for developing and implementing innovative and comprehensive approaches to water conservation public outreach and education.

Water Department's Landscape Watering Calculator

The City of San Diego Water Department received another award from Felicia Marcus of the Environmental Protection Agency (EPA) for the Department's Landscape Watering Calculator as part of the California Water Policy Conference. The Calculator was honored for its innovative approach to saving water and helping the environment. The Calculator is an easy-to-access tool designed to help citizens avoid over-watering their landscapes by determining appropriate watering durations and amounts. The calculator was designed to give a weekly schedule for the maximum amount of water which plants may need each month of the year. Because each landscape is different, the Calculator has been simplified by using average numbers for weather, plants, and soils in San Diego.

Landscape Watering Calculator has produced enough schedules to account for water savings of 815,520 GPD in fiscal year (FY) 2004.

Thanks to a feature article in the national publication *U.S. Water News*, the Water Department's Landscape Watering Calculator has received attention from other city and county water agencies interested in developing a similar water-saving online application. The Calculator is linked by the Water Authority and used by Metropolitan to expand its reach to their customers. The City of Santa Barbara's Water Conservation Program now has a Calculator on their website, and the following other cities and counties have also expressed an interest in developing Calculators: Marin County, CA; Collier County, FL; Avondale, AZ; Tacoma, WA; and St. Charles, MI. In addition, the CUWCC has expressed an interest in adopting the Calculator for all of California to access.

The City of San Diego Water Department was also honored with a Solutions Award from Public Technology Incorporated (PTI) for the Calculator. The web-access of the City's Calculator is: http://apps.sandiego.gov/landcalc/start.do .

Ms. Frizzle's™ World of Water

The City of San Diego Water Department partnered with the San Diego Natural History Museum, to bring back Ms. Frizzle™. This time teaching children the important role water plays in our lives and how to use it wisely. This is an enhanced effort by the Water Department to reach out and teach our youngest customers, even in the pre-school age range, the value of water conservation.

Innovative Conservation Program Grant

The Water Department recently received funds for a hot water circulating pump pilot program, funded by Metropolitan. This is an emerging water-savings technology that saves water by reducing "warm-up" time for sinks and showers. Based on preliminary research, this system can save the average family a minimum of 15,000 gallons of water annually. The program is currently under-way, with homeowners from each City Council district participating in the pilot program. Results were recently published.

Rinse n' Save Program for Restaurants

Restaurants were able to save water and energy with the highly successful Rinse n' Save Program coordinated by the Water Authority. High-velocity, high-performance pre-rinse nozzles were installed (free of charge) to reduce the amount of hot water used to pre-rinse dishes for the dishwasher. Recently, 1,377 nozzles were installed in San Diego restaurants with each nozzle saving, on average, 200 gallons per day (GPD).

2.5.2 Ongoing Conservation Programs and Initiatives

To meet established goals, the Water Conservation Section continues to integrate existing programs while developing new programs all focused on achieving the additional AF savings. The following outlines ongoing programs and initiatives.

Ultra-Low Flush Toilet (ULFT) Incentives

The ULFT Toilet Voucher Program promotes the incentive-based upgrade of existing fixtures to water-efficient models. Customers receive vouchers that reduce the cost of water efficient toilets to replace toilets using 3.5 gallons per flush (GPF) or more. This program is estimated to provide over 9 MG of water savings each day.

In a study conducted by the Water Authority, the projected potential of high-volume toilet retrofits (600,000 residential fixtures) in the City was enough to continue providing retrofit incentives through 2006. Likewise, continued interest in the program has been demonstrated by organizations like the San Diego Association of Realtors, and by water customers who continue to retrofit homes and apply for vouchers in order to comply with San Diego Municipal Code (SDMC) 147.04, the City's "Retrofit Upon Resale" Ordinance (**Appendix F**).

Commercial Landscape Survey Program (CLSP)

The CLSP has proven to be a major source of water savings based on surveys conducted this past year. Commercial properties with more than 1-acre of landscape can participate in this program. They receive an audit of their irrigation system, water-saving recommendations and a water-use budget. Sites that significantly reduced water use over the past year include: properties managed by homeowner's associations – 21 percent average reduction; commercial sites – 9 percent average reduction; and City facilities – 31 percent reduction.

Water Conserving Municipal Codes

The concept of an ordinance that would require the retrofitting of properties upon change of property ownership or bathroom alteration was first discussed by the City Manager's Water Conservation Advisory Committee in the spring of 1990. By March 14, 1991, San Diego had an ordinance which required the installation of water conserving plumbing fixtures in all new construction. In addition, the City Council requested that the City Manager develop a separate ordinance requiring the replacement of existing toilets with ULFTs when remodeling a bathroom or upon change of property ownership. The Department has processed over 100,000 certificates of compliance with SDMC 147.04.

Residential High Efficiency Clothes Washing (HEW) Machine Vouchers

The High-Efficiency Clothes Washer Voucher Program provides a point-of-purchase discount of $125 off the cost of a new qualifying HEW. These machines use 40 percent less water and 60 percent less energy per load than standard top-loading machines. HEWs are also credited with cleaning clothes more thoroughly, reducing detergent requirements, and reducing wear and tear on clothing. Currently, San Diego Gas and Electric (SDG&E) provides a $35.00- $75.00

incentive for HEWs, thereby increasing the total incentive for City customers up to $200.00. Each residential HEW washer saves approximately 5,100 gallons per year over the life of the washer (approximately 16 years).

Commercial, Industrial, Institutional (CII) Vouchers

The CII Voucher Program offers vouchers to commercial, industrial and institutional customers. Managed by the Water Authority, point-of-purchase vouchers are offered for an X-ray processor water conservation unit, cooling tower conductivity controllers, water brooms, urinals, and coin-operated HEW machines. Coin-operated HEWs vary in their water savings depending on the model and site usage, but in an average laundromat, a HEW can be expected to save about 60 GPD. Surveys indicate that the average cooling tower conductivity controller will save about 492 GPD, water brooms 140 GPD, and X-ray units 2,857 GPD.

Residential Interior/Exterior Water Surveys

This program offers residential customers an interior and exterior water use survey of their property. The service consists of analyzing water usage and flow rates of fixtures, checking for leaks, installing water-saving devices, and recommending efficiency improvements to landscaping and irrigation. A typical household participating in this program can reduce daily water consumption by 13 percent. This program is extremely popular, because surveyors can often identify hard-to-find water leaks that contribute to higher water and sewer bills. The Residential Survey Program accounts for water savings of about 40 GPD for each survey.

CIMIS Stations

One of the keys to effectively managing irrigation for agricultural customers, commercial nurseries and the City's Landscape Watering Calculator is accurate weather information. Weather patterns (solar radiation, wind, rain, relative humidity) have a direct impact on the watering needs for turf, trees, shrubs and other plants.

The City of San Diego partners with the California DWR to locate, calibrate, and maintain CIMIS weather stations. CIMIS stations are passive data loggers that gather accurate weather data to create and track ET values. ET provides information on when and how much to water plants. This real-time weather data is one of the keys to water savings with central irrigation control systems and conventional controllers. The advantage of CIMIS is that it is a recognized standard and the equipment calibration is performed regularly. City staff, working in conjunction with the DWR, provides local support for the four CIMIS stations located in the maritime, coastal, central, and inland weather bands of San Diego. The data from these stations is used to develop water budgets. Data from the University of California, Berkley, shows water reduction of 13 percent when CIMIS data is used, which equals 60,000 GPD for the City's agricultural customers and commercial nurseries.

Water Conservation Garden on the Campus of Cuyamaca College

To show customers how to have a beautiful, yet water-efficient garden, the City continued its partnership with several agencies to promote the Water Conservation Garden on the campus of Cuyamaca College. The garden serves as a learning resource center with beautiful, healthy gardens. It includes an amphitheater, multiple educational exhibits, more than 360 trees, and 100,000 square feet of water-efficient landscaping well-suited to San Diego's climate.

Park and Recreation Department Support

The Water Department partners with the Park and Recreation Department to fund the replacement and upgrade of irrigation fixtures as well as a Horticulturist position for the Park and Recreation Department. Proper management, maintenance and repair of irrigation fixtures reduces water consumption and waste at City parks. It also sets a good example for residents to see the City using water wisely. As part of this effort, the Water Department and Park and Recreation Department jointly received a California Municipal Utilities Association Award for this program, which accounts for cumulative water savings of 1,633,598 GPD.

Public Education, Information and Community Outreach

Central to the overall water conservation goal is an enhanced public education program. Public education promotes new conservation efforts as well as the existing foundation of conservation programs. The campaign is structured to reach schoolchildren as well as adults. Elementary students design posters promoting water conservation.

The Water Conservation Section continued to focus on placing articles in community newsletters, participated in a Water Forum hosted by the League of Women Voters, made local television news appearances, and developed "month-to-month" water conservation tips that can be given to all media formats. Additionally, information materials were provided to the City's Community Service Centers to enhance their "welcome wagon" outreach efforts. Recent articles were placed in the following publications: *The San Diego Union-Tribune, San Diego Family Magazine, San Diego Metropolitan, Tierrasanta Times, La Prensa, Asian Journal, Philippine Mabuhay News, Navy Dispatch, Mira Mesa/Scripps Ranch Sentinel, California Garden, San Diego Earth Times , I-15 Diamond Gateway Newsletter, Scripps Ranch Planning Group Newsletter, Institute of Real Estate Management Newsletter, San Diego Association of Realtors Newsletter, California Landscape Contractors Association Newsletter, American Institute of Architects Newsletter, The Coast News, NASSCO Tidepool, The Catalyst, Rancho Bernardo News Journal, San Diego Home/Garden Lifestyles, Offshoot, California Garden, Gaslamp Globe, and U.S. Water News.*

Water Conservation staff members actively participate in community fairs, providing informational brochures on the various programs and promoting both simple and highly technical conservation measures. Additional components of this program include: updating and maintaining the Department's and Water Conservation web-site, providing more and better quality brochures and fact sheets that have a centralized theme for water conservation, advertising, working with local television and radio news stations, and coordinating with the

Water Authority, Metropolitan, and other local agencies on regional water conservation efforts. Special events that Water Conservation staff attended include the San Diego EarthFair at Balboa Park, the San Diego County Fair at Del Mar, Spring Garden Festival, and other local events.

The Water Conservation Program continues to maintain its interactive educational display at the Reuben H. Fleet Science Center in Balboa Park. The exhibit, entitled *"San Diego's Water, from Source to Tap,"* details the long journey our water makes to reach our faucets and the technology involved in providing water to the City. The exhibit is part of the science center's TechnoVation collection, showcasing local technological achievements. The exhibit is expected to reach an audience of 2.1 million people. The project was created in partnership with the Water Authority and made possible through a grant from the Hans and Margaret Doe Charitable Trust.

Facility Repair and Replacement/Leak Detection

The replacement of the City's cast iron mains through Capital Improvement Programs (CIP) along with the Operation Division's Leak Detection Crew, decreases the amount of main breaks and associated water loss.

Water Waste Investigations

Water Conservation Program staff respond to water waste complaints generated by citizens throughout the Department's service area. Staff contacts the property owner or manager and work to resolve all kinds of water waste concerns and their associated hazards. Water waste complaints can range drastically, yet a typical example would be a broken sprinkler head which is wasting 10 to 15 gallons per minute and flooding adjacent properties.

2.5.3 New Programs Under Development

Satellite Project

Satellite technology will soon play an integral part of water conservation efforts in San Diego. An innovative new project is underway that will use satellite imagery to create a citywide map designed to determine accurate water budgets for all landscaped areas. In addition to being more cost-effective, the use of satellite images, versus aerial photographs, will provide the city with more expansive land use data. The project is a joint partnership between the U.S. Bureau of Reclamation (USBR), who is funding the project, and the Water Department. AgriCast, Inc., the technical consultant for the project, will turn satellite imagery provided by USBR and the Earth Satellite Corporation from multi-spectral color images into a functioning Geographical Information System (GIS) map. The satellite image map will consist of various color pixels, each representing a 2.5-meter by 2.5-meter (8ft. x 8ft.) area of land. The color pixels in the image are matched to what is on land to show all irrigated landscape plants, such as trees, shrubs or groundcover, by assigning each individual landscape type to a specific pixel color. Accurate areas designated for each landscape type can then be calculated. Once all irrigated landscape areas are accurately accounted for, the Water Department can easily create water budgets based on the needs for each individual plant type per square meter. Comparisons can then be made between data from past water meter readings for irrigation purposes and how much water is

actually needed to maintain healthy landscapes. The differing amount between what is needed and what is being used becomes the water that is available for conservation. On average, water budgets show a potential water savings of 20 percent or more. The project will be completed in one year, and when the digital map is produced, it will serve as both a policy-making and engineering measurement tool for the City. Once a dollar value is given to the amount of water that could be saved, policy-makers will have a solid basis for allocating resources to assist Water Department customers, both residential and commercial, via the free programs and services offered through the Water Conservation Program.

Commercial Landscape Incentive Program (CLIP)

The Water Conservation Program will soon launch CLIP, thanks to funding from Metropolitan and the Water Authority. Both were recently awarded with grants from Proposition 13 to fund landscape incentives and ET controllers (irrigation controllers that use weather factors and plant watering requirements) for the next three years.

The CLIP will offer commercial and residential properties incentives for landscape water conservation tools such as "smart timers," which are sprinkler clocks that adjust themselves throughout the year, and hardware devices like pressure regulators and sprinkler heads that will improve the efficiency of irrigation systems. The City is slated to begin offering these incentives through the CLIP in the next year or so, pending program approval by the City Council. The City's commercial customers who participate in the Commercial Landscape Survey Program will be eligible to receive these incentives.

Landscape Requirements for New Development

The Water Conservation Program has partnered with the Development Services Department to revise the provisions of the City's Landscape Ordinance to require water conservation measures in new development. Specifically, all permits for properties that have substantial landscaped areas will be required to submit a water budget plan before permits are approved. The water budgets will also require that the irrigation controller schedules developed using the City's Watering Calculator be taped to the inside cover of each irrigation controller. Similar requirements may be incorporated into the City's General Plan (GP), as a partnership was initiated in January 2003 when the Water Department joined a combined presentation to the Planning Commission on the City's environmental programs. Cooperative efforts will continue as the City GP is revised in the next few years.

2.5.4 More than "Just Saving Water"

Storm Water Pollution Prevention

Water conservation contributes more than just local water savings. Proper water conservation techniques assist the City's Storm Water Pollution Prevention Program. When excess irrigation water flows out of yards, it flows directly into storm drains. Everything that flows down into a storm drain goes untreated directly into canyons, creeks, bays, lagoons and ultimately the ocean. Irrigation runoff water carries pesticides, fertilizers, motor oil, pet waste and silt. The Clean Water Act prohibits disposal of wastes and pollutants into creeks, bays, lakes and oceans. Such

pollutants have harmful effects on recreational areas, waterways and wildlife. Proper irrigation scheduling either through the Section's various survey programs or the Department's website landscape watering calculator prevents storm water pollution.

The Water-Energy Link

The CUWCC, the Association of California Water Agencies, the Flex Your Power Campaign, and the California Water Awareness Campaign continue to partner in providing State water agencies access to their multi-million dollar advertising campaign. The ads provide consumers with a web site that will act as a clearinghouse of program and contact information. Consumers can enter their ZIP code to access a list of programs and services available, along with the contact information. The City's Water Conservation team has already provided information on our programs, and is currently working on additional outreach measures to compliment this campaign.

The California Energy Commission notes that "moving water around the state takes up to 10 percent of the total energy supply." By helping our customers conserve water locally, the Water Department is helping the entire State of California deal with its ongoing energy issues. Before it reaches arid San Diego, water is pumped hundreds of miles from either the Sacramento-San Joaquin Bay Delta in Northern California or from the Colorado River. It takes energy to move and treat water.

TABLE 2-10
CITY OF SAN DIEGO WATER CONSERVATION SAVINGS ESTIMATES THROUGH 2030
(AF YEAR)

Demand Management Measures	2005	2010	2015	2020	2025	2030
Existing DMM's						
Residential Surveys	1,394	1,394	1,394	1,394	1,394	1,394
Residential Retrofits/Ordinance	7,244	7,244	7,244	7,244	7,244	7,244
Landscape	5,433	9,227	10,434	11,642	12,849	14,057
Clothes Washer Incentives	284	760	997	997	997	997
Commercial/Industrial/ Institutional	2,333	2,500	2,821	3,793	4,757	5,725
ULFT Incentives	11,674	12,740	12,740	12,740	12,740	12,740
Other DMM's and Programs	2,063	2,270	2,480	2,590	2,700	2,810
Subtotal	30,425	36,135	38,110	40,400	42,681	44,967
Potential DMM'S						
Efficiency Standards (Passive)	9,088	10,411	11,412	12,523	14,086	15,121
On Demand Water Heaters		2	4	6	8	10
Subtotal	9,088	10,413	11,416	12,523	14,094	15,131
TOTAL	**39,513**	**46,548**	**49,526**	**52,929**	**56,775**	**60,098**

2 .6 PLANNED WATER SUPPLY PROJECTS AND PROGRAMS

In 1997 the City developed the Strategic Plan. This plan focused mainly on engaging the city in the planning and development of its own water supply in order to become less reliant on imported water, mainly through the development of the CIP. Since then, the City has continued to prepare for the future by investigating water supply options and developing a long-term water supply strategy designed to meet San Diego's water needs for the next 30 years.

Over a two year period the Water Department worked closely with a twelve member Citizen's Advisory Board (CAB). The CAB members, representing a variety of community interests and groups, were an integral part of the planning process. The result of this effort was the creation of

the Long-Range Plan. The Long-Range Plan was unanimously adopted by the City Council on December 9, 2002.

The Long-Range Plan is flexible and adaptive to a changing environment, and will provide the City with a "roadmap" for developing water supply alternatives. In addition the City has successfully completed numerous projects and water infrastructure improvements providing the residents of San Diego with a reliable and safe water supply.

Currently, one of the challenges the City of San Diego is tackling is future funding. Due to the lack of current published financial statements and the completion of related audits and investigations, the Water Department is unable to secure bonds for new projects. At this time the Water Department has ceased awarding new contracts for the CIP program so the city does not obligate itself to contracts it may not be able to fully fund without additional financing.

Although the City of San Diego is not planning any new water supply projects or programs to be included in the 2005 Plan, we fully support the Water Authority in their Capital Improvement Program and their exploration of new water supply opportunities.

2.7 DEVELOPMENT OF DESALINATED WATER

Future Supplies

In 2002, the City of San Diego City Council adopted the Long-Range Plan which provided a decision-making framework for evaluating water supply options. The Long-Range Plan identified and included, among other items, groundwater and ocean desalination as potential near-term and long-term supplies. The Long-Range Plan concluded that no single supply source would be sufficient to meet future water demands, but a portfolio of supply options would reduce the City's dependence upon imported water over time.

The Long-Range Plan identified priority supplies for implementation. The supply options included water conservation and recycled water, groundwater storage, brackish groundwater desalination, and water transfers. Conservation programs and recycled water supply projects have been implemented and will be continuing through 2010 and beyond. The Water Department is currently investigating the development of groundwater desalination and water transfers for 2010 to 2020. Efforts are ongoing to identify longer range opportunities (2010 and 2030) such as ocean desalination.

Ocean Desalination

Ocean Desalination is a process where salt and other impurities are removed from seawater. Desalinated seawater is used as a potable water supply in many areas of the world where fresh water is deficient and sometimes described as a solution to the San Diego region's over reliance on the Colorado River and Northern California.

Although the City of San Diego is not including an ocean desalinated water supply in the 2005 Plan to meet demands in the 2005-2010 timeframe, the City supports the Water Authority in its hard efforts to promote ocean desalination as a viable technology in San Diego County.

The City plans to include the further investigation of ocean desalination in the southern area of the City for the time period of 2010-2030 in the Water Resources Implementation Plan that is presently in draft form. In the southern portion of the San Diego Bay there is a potential site at a seawater cooled power generation facility which might provide some suitability for a co-located seawater desalination project. For the purposes of this Plan from 2005 to 2010, seawater desalination is not included as a resource to meet demands.

Groundwater Desalination

Over the past several years, the Water Department has studied numerous potential groundwater supply options and has a CIP project to continue the quest to develop potential groundwater resources including groundwater desalination. The City is preparing a Water Resources Implementation Plan that will evaluate and recommend groundwater storage and desalination projects for implementation from 2010 to 2020.

2.8 Current or Projected Supply Includes Wholesale Water

The City has and will continue to rely on imported water from the Water Authority. In order to help the Water Authority plan for their customer's future demands the DWR Guidebook requires that each agency who receives wholesale water provide their demand projections to the wholesaler. Therefore demand projections for imported water for the City are shown below and are based on the projections prepared by the Water Authority.

TABLE 2-11
AGENCY DEMAND PROJECTION FROM WHOLESALER
(AF YEAR)

Wholesaler	2010	2015	2020	2025	2030
San Diego County Water Authority (Purchased)	201,901	205,178	212,260	222,238	231,725

In order to meet customer demands the Water Authority includes the following resources in their 2005 Plan: adoption of the Quantification Settlement Agreement, agreement between Water Authority-IID to transfer water, agreement between Metropolitan and Water Authority to line the All-American Canal (AAC) and the Coachella Canal (CC), and commencement of the Water Authority's Seawater Desalination Program. This is in addition to their supply allocation from Metropolitan. By adding this water resource mix to its supply from Metropolitan, the Water Authority is able to increase supply reliability to its customers.

The Water Authority's supply estimates are summarized in **Table 2-12**. Since the City is one of twenty-three member agencies of the Water Authority, the supply estimates are shown for all the member agencies. A more detailed discussion can be found in the Water Authority's 2005 Plan.

TABLE 2-12
WHOLESALER IDENTIFIED & QUANTIFIED SOURCES OF WATER
(AF YEAR)

	2010	2015	2020	2025	2030
	Exist. / Planned	Exist. / Planned	Exist. / Planned	Exist. / Planned	Exist. / Planned
Desalination*	-	56,000	56,000	56,000	56,000
IID Transfer	70,000	100,000	190,000	200,000	200,000
ACC & CC Lining**	77,700	77,700	77,700	77,700	77,700
Metropolitan	445,858	378,544	311,438	324,624	356,922

* Scheduled for completion prior to 2015.
** Scheduled for completion prior to 2010.

Discussion of the Water Authority's water supply reliability and supply estimates for normal, single and multiple dry-years can be found in their 2005 Plan.

SECTION 3 – DETERMINATION OF DMM IMPLEMENTATION

Table 3-1 provides a summary of the City of San Diego's progress in implementing water demand management activities**. Appendix G** contains the City's FY 2003-2004 Annual Best Management Practices (BMP) Reports. Both annual updates are considered completed by the CUWCC website.

TABLE 3-1
DEMAND MANAGEMENT MEASURES
FOR WATER CONSERVATION

DMM #	Description	Conservation Programs	Compliance
1	Residential Water Survey	Residential Survey Program	Yes
2	Residential Plumbing Retrofit	Retrofit Upon Resale Ordinance	Yes
3	System Water Audits, Leak Detection and Repair	Leak Detection Program	Yes
4	Metering with Commodity Rates	• Meters for new construction • Billing by volume	Yes
5	Large Landscape Conservation Programs and Incentives	• Commercial Landscape Surveys • Water Budgets • Landscape Watering Calculator	Yes
6	High Efficiency Washer Rebate Program	Residential HEW Voucher Program	Yes
7	Public Information Programs	• Media Coverage • Bill inserts/info • Website • Poster Contest • Billboards	Yes
8	School Education Programs	Wholesaler Operates	Yes
9	Conservation programs For Commercial, Industrial, and Institutional	• CII Vouchers • CII Surveys	Yes
10	Wholesale Agency programs	Wholesaler Operates	Yes
11	Conservation Pricing	• Billing for water used based on metered use • Increasing block rate for residential	Yes

12	Water Conservation Coordinator	Water Resources Staff	Yes
13	Water Waste Prohibition	SDMC 67.38	Yes
14	Residential ULFT Program	ULFT Voucher Program	Yes

SECTION 4 - WATER SHORTAGE CONTINGENCY PLAN

Introduction

The Act requires water agencies to incorporate a water shortage contingency analysis, which focuses on the allocation of water supplies and the management of water consumption during periods of shortage due to extended drought or a water emergency. Despite ongoing efforts to diversify its supply, the City still derives most of its water from Metropolitan via the Water Authority. Understanding the policies and principals that Metropolitan and the Water Authority follow during periods of water shortage is important as the City develops its own water shortage response plan. This section references several current planning documents developed by the Water Authority and Metropolitan which are the road map to guide these agencies during drought or water emergency.

The City's shortage contingency plan characterizes specific water supply conditions that trigger the activation of voluntary and mandatory rationing efforts. It discusses the ability to meet projected short-term demands during extended dry periods and highlights some of the significant proactive measures that enhance the City's ability to respond to interruptions in water supply should a natural or man-made disaster occur. The contingency plan outlines the planned response to failures in the water system's infrastructure in the event of an earthquake, extensive power outage, or other catastrophic event. Finally, this section describes the prohibitions and penalties against specific water uses during water shortages, and evaluates potential impacts to the Water Enterprise Fund should water sales decrease as a result of supply shortages.

4.1 STAGES OF ACTION

Because San Diego never receives adequate local precipitation to support the demand for water, the City is committed to promoting water conservation amongst its citizenry every day, all year long. Customers are encouraged to participate in the numerous conservation programs that are consistent with CUWCC's Best Management Practices. More information on the City's demand management efforts can be found in **Section 2.5**. With a continuous focus on widespread voluntary conservation, even during years of normal and above average precipitation, the Water Department believes it is in the best possible position to manage mandatory water rationing efforts in the event that local and imported supplies are negatively impacted by extended drought or a catastrophic event.

The City of San Diego's Municipal Code includes the Water Emergency Regulations, which authorizes the City Manager and City Council to determine and declare water shortage emergencies in any and/or all parts of the City. A water shortage exists when a general water supply shortage occurs as the result of: (1) an increased demand or limited supply; (2) the distribution or storage facilities of Metropolitan, the Water Authority and/or the City are inadequate; (3) a disruption occurs in supply, storage, or distribution facilities of Metropolitan, the Water Authority, or the City.

The Emergency Water Regulations characterize four water supply conditions that trigger activation of progressively restrictive stages of water rationing. Water conservation measures called for in Stage 1 (Water Watch) are voluntary. Stages 2, 3 and 4 call for the mandatory participation in water rationing. While these regulations do not explicitly correlate a pre-determined percentage reduction in water supply to each of the four stages of action, **Table 4-1** presents the estimated percentage reduction in water supply that triggers each stage of action. Shortage conditions that trigger the activation of Stage 4 (Water Emergency) set the most extreme water rationing measures into effect, and are in response to a major failure of or interruption to any Metropolitan, Water Authority, or City water supply or distribution facility.

TABLE 4-1
WATER SUPPLY SHORTAGE STAGES AND CONDITIONS

Stage of Action	Water Supply Conditions	% Water Supply Shortage*
Stage 1: Water Watch (voluntary compliance)	Applies during periods when the *possibility* exists that the Water Department will not be able to meet all of the water demands of its customers.	**5%**
Stage 2: Water Alert (mandatory compliance)	Applies during periods when the *probability* exists that the Water Department will not be able to meet all water demands of its customers.	**10%**
Stage 3: Water Warning (mandatory compliance)	Applies during periods when the Water Department *will not* be able to meet all water demands of its customers.	**30%**
Stage 4: Water Emergency (mandatory compliance)	Applies when a *major failure* of any supply or distribution facility, whether temporary or permanent, occurs in Metropolitan, Water Authority, or City water distribution system and facilities.	**50%**

* Water Supply Shortage is based on percentage estimates of the anticipated reduction in water supply that trigger activation of the conservation measures set forth in each stage.

4.2 Minimum Water Supply for the Next Three Years

In preparing Urban Water Management Plans, DWR suggests that the water shortage contingency plan should include a projection of the minimum water supply available in the short-term (2006-2008) based upon the driest three-year historic sequence (meaning the recorded three-year period with the lowest runoff in the watershed of the supply source, typically agreed to be 1990-1992 in California). DWR divulges in its 2005 UWMP guidelines that;

> "Different sources of water supplies will have different historical dry year sequences, and different yields during multiple year drought conditions based on hydrology,

available storage, contract entitlements, water right characteristics, etc. In some cases there are not direct correlations between local hydrology and the minimum available water supply (e.g., groundwater, recycled water, water transfers, conservation, and desalination)."

This is applicable to San Diego, where historically the region has relied heavily on imported water from northern California and the Colorado River, yet recently the Water Authority and City have started to diversify supplies. The City is diversifying local supply sources by increasing its use of recycled water and promoting conservation. The Water Authority has recently started diversifying imported supply sources, as is seen with the 2003 IID Transfer Agreement. The Water Authority is also pursuing desalination and anticipates that a desalination plant that will be constructed in the City of Carlsbad will begin producing potable water for the region in 2012. This plant will provide as much as 56,000 AFY of potable water by 2020. A more in depth discussion on the development of these sources is included in **Section 2**. San Diego County still relies extensively on imported water from Metropolitan; however the region's recent development of alternative drought-proof supplies renders an analysis of the projected supply and demand for 2006-2008 unsuitable if it is based only upon historic availability, as suggested in DWR's guidelines. Neither Metropolitan nor the Water Authority includes such short-term projections in their 2005 Draft Plans. Policies and guidelines that Metropolitan, the Water Authority, and the City will follow when required to allocate limited supplies are discussed later in this section.

4.2.1 Metropolitan and Shortage Contingency Planning

Metropolitan evaluates supply reliability using its computer model called IRPSIM. The model incorporates 70 years of historical hydrological data (1922 – 1991) to calculate supply and demand projections. Metropolitan's 2005 Plan indicates that the agency can maintain reliable supplies to its member agencies under a *variety of dry conditions* through the year 2025. Based upon historic hydrological data, Metropolitan reports that it is capable of supplying water that meets *all projected demands* under (1) a series of multiple dry years; (2) during conditions like those that existed during the single driest year (1977); and (3) during the expected supply and demand anticipated under the historic hydrological average. Metropolitan's 2005 Draft Plan does not include an analysis of its ability to meet anticipated demands should supply conditions develop in the next three years under similar supply conditions that existed during the *driest three-year historic hydrological sequence* of 1990 – 1992. However, in order to plan for water supply shortages, the 2003 Integrated Regional Plan (IRP) Update recommends that, "a supply buffer of 500,000 acre feet is developed that can serve as a contingency measure to help ensure regional reliability…".

Metropolitan's 1999 Water Surplus and Drought Management (WSDM) Plan is a guide for the management of Southern California's water supplies and is aligned with the goals of the IRP. The guiding principal adopted in the WSDM Plan is to effectively manage resources that maximize surplus supplies during wet years, and minimize adverse impacts of water shortages to its retail customers. Metropolitan asserts that the WSDM Plan, when implemented, will result in 100 percent regional reliability for non-discounted, non-interruptible customer demands through 2025**.** This implies that water will be available even in the most severe shortage conditions.

Metropolitan has no definitive methodology to allocate water to member agencies during supply shortages, but it does subscribe to the following fundamentals when determining allocations for imported water to its full-service customers:

- Encourage efficient water use and economical local resource programs.
- Coordinate operations with member agencies to make as much surplus water as possible available for use in dry years.
- Pursue innovative transfer and banking programs to secure more imported water for use in dry years.
- Increase public awareness about water supply issues.

In addition, Metropolitan considers the following factors when determining the allocation of imported water during times of extreme shortage:

- Impact of retail customers and regional economy.
- Investments in local resources, including recycling and conservation.
- Population growth.
- Changes and/or losses in local supplies.
- Participation in Metropolitan's non-firm (interruptible) programs.
- Investment in Metropolitan's facilities.

4.2.2 Shortage Contingency Planning in San Diego

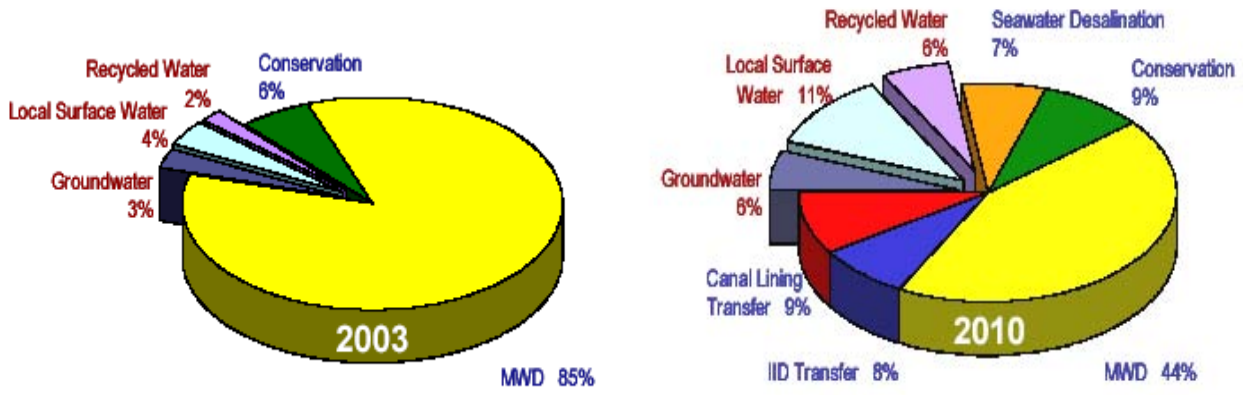
As mentioned, any contingency planning effort pursued by the City must consider how Metropolitan and the Water Authority will allocate imported water during periods of shortage. History helps paint a picture of the San Diego region's vulnerabilities during times of supply shortage. The last major drought in California occurred between 1987 and 1992 and caused severe water supply shortages throughout the state. During early March 1991, at the peak of the drought, Metropolitan's SWP supplies were reduced by 90 percent, translating to a 50 percent reduction in imported water deliveries to the Water Authority. During that time the City Council responded to the bleak water supply outlook by declaring a drought emergency and adopting a motion to achieve a 30 percent City-wide water conservation goal. The rains of "Miracle March" dramatically reduced the severity of the drought throughout California, prompting Metropolitan to roll back its call for conservation from 50 to 31 percent, in turn allowing the City Council to reduce its City-wide conservation goal from 30 to 20 percent in April 1991. On the average, City residents successfully conserved an average of 26 percent between April and December 1991, reflecting San Diegans' strong commitment to water conservation. Because of the region's heavy reliance on water imported solely from Metropolitan, the State-wide drought of 1987-1992 impacted the Water Authority and its member agencies more so than Metropolitan's other member agencies.

Adding to the region's vulnerabilities during periods of shortage is Section 135 of Metropolitan's Act, which defines each of Metropolitan's member agencies' preferential right to water, using a formula that is not based upon historic water sales. Metropolitan calculates that the Water Authority has a preferential right to about 15.5 percent of Metropolitan's supply, yet accounts for about 28 percent of Metropolitan's water sales. In an attempt to elucidate the extent of its risk to

future cutbacks during periods of supply shortage, the Water Authority recently sought clarification as to the legality of Section 135 by appealing a ruling preserving Metropolitan's preferential rights allocation methodology. The State Supreme Court denied the appeal in July of 2004, ending the Water Authority's legal challenge to Metropolitan's preferential rights system of water supply allocations. The discrepancies surrounding preferential water rights under Section 135 leave the Water Authority's member agencies susceptible to the possibility of extreme cutbacks in imported water from Metropolitan during times of severe water shortages like those that were passed down during the 1987-1992 drought.

Today, Metropolitan supplies about 85 percent of the Water Authority's total water supply. Metropolitan will remain a significant source of supply to San Diego in the future. However, as previously discussed, the Water Authority and the City continue to focus on diversifying it supply resource mix in order to limit an over-dependence on any single supply source. **Figure 4-1** illustrates the significant changes in the anticipated supply mix between 2003 and 2010. It is expected that over the next five years imported water from Metropolitan will decrease from 85 percent to 44 percent, while the region's use of alternative supplies including desalination, conservation, recycled water, groundwater, and water transfers will grow to compensate for the anticipated decrease in Metropolitan supplies.

FIGURE 4-1
WATER SUPPLIES
2003 & 2010
MEMBER AGENCY SUPPLIES IN RED
THE WATER AUTHORITY'S SUPPLIES IN BLUE



Source: The Water Authority's 2010 Business Plan

As a result of the Water Authority's 2003 IID transfer agreement, the San Diego region has already started to reduce its reliance on imported water supplied by Metropolitan. The IID water transfer schedule for 2003 through 2010 is as follows:

TABLE 4-2
SCHEDULE FOR IID WATER TRANSFERS TO THE WATER AUTHORITY

YEAR	TRANSFER (AF)
2003	10,000
2004	20,000
2005	30,000
2006	**40,000**
2007	**50,000**
2008	**50,000**
2009	60,000
2010	70,000

The Water Authority's 2005 Draft Plan includes a regional drought response matrix for firm water demands, which shows the potential actions that are recommended during a drought by the Water Authority. The matrix provides guidance to the Water Authority and its member agencies in determining the most effective actions to mitigate shortage conditions. **Appendix H** includes the Water Authority's drought response matrix, which is categorized into three main stages: (1) voluntary, (2) the Water Authority supply augmentation, and (3) mandatory cutbacks (including a 50 percent cutback). The matrix proposes specific actions to be taken within each of the three stages. The idea is that during times of shortage when conservation is recommended or required, the Water Authority and its member agencies will evaluate conditions specific to the timing and supply availability along with other relevant variables (including SWP allocation, conditions on the Colorado River, the Water Authority's supplies, local storage and local demand). These variables will help determine which conservation actions will be implemented during shortages.

Up until this point in time, the Water Authority has not maintained a methodology during shortages for allocating untreated imported water to its member agencies. However, it is in the process of finalizing a Drought Management Plan (DMP). The DMP will include an allocation methodology that will pre-determine supply availability to member agencies during shortages and establish how local resources will be handled. Part of the DMP development process includes establishing a set of principles to guide implementation of the plan by the Water Authority and its member agencies. The following principals serve as the basis in developing an allocation methodology to be followed during periods of extreme shortage.

- The allocation methodology will be equitable, easy to administer, contain financial penalties and pricing signals, and communication strategy to ensure member agencies and the public are informed and understand the need to conserve.
- In order to protect the economic health of the entire region, it is very important for the allocation methodology to avoid large, uneven retail impacts across the region. The methodology should include a minimum level of retail agency reliability to ensure equitable allocation among the member agencies.
- With the exception of allocating water from the ESP, the Water Authority shall make no distinction among customers paying the same M&I rate (e.g. Non-Interim Agricultural Water Program (IAWP) agriculture, residential, commercial, and industrial).

- Additional IAWP cutbacks beyond the initial 30 percent faced by IAWP customers should be equally applied to both IAWP and M&I customers.
- A member agency that has developed local projects and instituted conservation measures should not be penalized in the computation of allocations.
- To help balance out the financial costs and risks associated with development of local resources, the shortage allocation methodology should provide an incentive to those member agencies that have developed local supplies.
- The base-year, upon which allocations will be derived, will be based on historic demands. Adjustments to the base-year will be made for demographic changes, growth, local supplies, demand hardening, and supplies allocated under interruptible service programs.
- A member agency's base-year will be adjusted to reflect the regional financial contribution from the Water Authority for development of local projects. The adjustment will take into account the risks associated with developing the local projects.
- A member agency will not be able to market its unused allocation to other agencies within the Water Authority's service area at a cost higher than the Water Authority's charges for those supplies.
- Penalty rates, along with other demand reduction measures, will be used by the Water Authority to encourage conservation during a drought.

The City of San Diego maintains its Emergency Water Regulations **(Table 4-4)** which enable City officials to enact the Stages of Conservation as deemed necessary, given the supply shortage situation at hand. Stage 4, "Water Emergency", would be enacted during periods of most extreme shortages. These regulations serve as the guidelines for reducing water use during periods of supply shortages in the City.

4.3 CATASTROPHIC SUPPLY INTERRUPTION PLAN

The Act requires urban water agencies to provide a catastrophic supply interruption plan. This section discusses vulnerability of the City's various water sources in light of the potential impacts from non-drought related emergencies such as earthquakes, regional power outages, and system failures.

4.3.1 The Water Authority's Emergency Storage Project

Because the City of San Diego relies heavily on imported water from the Colorado River and SWP, the possibility of an earthquake or other catastrophe (either natural or man-made) poses a risk to the water transmission pipelines as well as the local distribution system. The Water Authority imports up to 90 percent of the region's water through pipelines that cross several major earthquake faults. Should the imported water supply pipelines be impacted due to either drought or disaster, it is important that locally stored water can be tapped and moved around the region's reservoirs and storage facilities. In 1998, the Water Authority added the ESP to its Capital Improvement Program. ESP water is stored for the purpose of being made available to member agencies during emergency situations such as prolonged drought or acute disaster causing disruption to the imported water supply. The ESP will enable the Water Authority to respond to the demands that could arise in two emergency scenarios: (1) an interruption in water delivery impacting Metropolitan's conveyance facilities (in turn reducing the amount of

imported water received by the Water Authority) for up to six months due to an earthquake along the San Andreas or San Jacinto faults, and (2) a two month interruption in delivery from Metropolitan due to an earthquake along the Elsinore fault that impacts the Water Authority's imported water pipeline**.** The ESP enhances the region's water storage capacity and pipeline delivery system, and expands both operational and distribution flexibility throughout the region and between the member agencies. The new Olivenhain Dam and Olivenhain Reservoir are central components of the ESP, which were completed in 2003. The Olivenhain reservoir has a capacity of 24,000 AF of water, enough to sustain 200,000 people for a year in the case of an emergency.

Table 4-3 provides a summary of the planned capital improvement components of the ESP that are expected to be complete by 2011. When complete, the ESP will provide an additional 90,100 AF of water storage capacity in the region. Combined with the existing storage capacity already dedicated to emergency use, the ESP contributes to the Water Authority's ability to meet projected water shortage emergency needs through at least 2030. (More information on the ESP is available in the Water Authority 2002 Draft Regional Water Facilities Master Plan and the Water Authority's 2005 Plan).

TABLE 4-3
COMPONENTS OF THE WATER AUTHORITY'S EMERGENCY STORAGE PROJECT

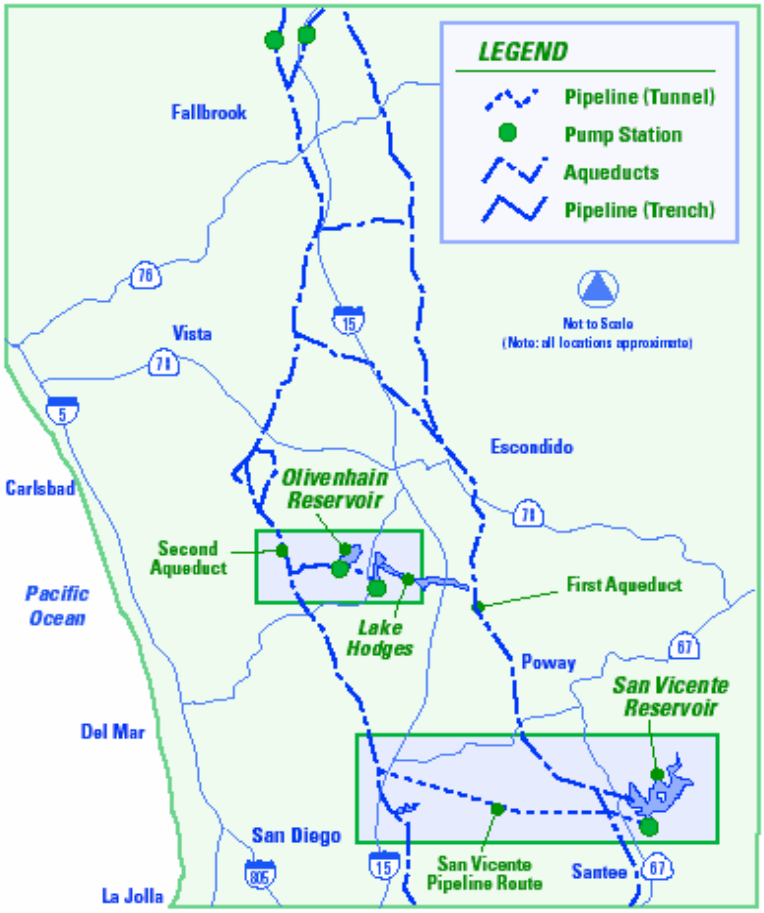
- CONSTRUCTION OF THE 318' OLIVENHAIN DAM AND 24,000 AF RESERVOIR (COMPLETED IN 2003)
- A PIPELINE CONNECTING NEW OLIVENHAIN RESERVOIR TO THE WATER AUTHORITY'S SECOND AQUEDUCT (COMPLETED IN 2002)
- A PIPELINE CONNECTING OLIVENHAIN RESERVOIR WITH LAKE HODGES (CURRENTLY UNDER CONSTRUCTION. SCHEDULED FOR COMPLETION BY 2008)
- RAISING SAN VICENTE DAM BY 54' TO PROVIDE AN ADDITIONAL 52,100 AF OF WATER STORAGE (SCHEDULED FOR 2008 - 2011)
- A PIPELINE CONNECTING SAN VICENTE RESERVOIR TO THE WATER AUTHORITY'S SECOND AQUEDUCT (SCHEDULED FOR 2008 - 2011)
- FIVE NEW PUMP STATIONS

To appropriately size the ESP, the Water Authority assumed a 75 percent level of service to all member agencies during an outage and full implementation of the water conservation BMPs. The methodology used to calculate the ESP supply allocations to member agencies during a prolonged outage without imported water is included in the Water Authority's 2005 Draft Plan and is as follows:

1. Estimate the duration of the emergency (i.e. time to repair damaged pipeline(s)).
2. Calculate the total estimated annual M&I and agricultural water demand for each member agency for the duration of the emergency.

3. Determine demands at 75 percent level of service for M&I customers and 50 percent level of service for IAWP customers. (IAWP customers have agreed to a lower level of service in order to avoid paying the Water Authority's storage rate.)
4. After determining the appropriate level of service demand for the agency, subtract the amount of water that the agency can self-supply from local sources during the emergency, up to a limit of four average months of demand. Local supplies include groundwater, recycled water, and local surface water.
5. The remaining unmet demand represents the agency's need for water from the ESP. This supply, coupled with any local supplies, will maintain a 75 percent level of service to M&I customers in a catastrophic emergency.

FIGURE 4-2
THE WATER AUTHORITY EMERGENCY STORAGE PROJECT MAP



Source: The Water Authority ESP Update, Spring 2005 Edition

4.3.2 The City's Emergency Water Storage Requirements

The City of San Diego Council Policy #400-04 "Emergency Storage of Water" outlines the City's Emergency Storage Program and provides guidance for the management of the City's reservoirs. The policy, provided in **Appendix E**, mandates that the City keep sufficient water in active available storage to meet sixth-tenths (the equivalent of 7.2 months) of the City's normal water demand requirements (not including conservation). Active, available storage is that portion of water that is above the lowest usable outlet of each reservoir. The six-tenths of the annual water demand requirement is intended to meet short-term water supply deficiencies, and is estimated based upon a moving average in anticipation of the upcoming six-tenths annual requirement. The required amount of storage at any given time is determined by the historic actual average consumption for the same period. As a result, there is a seasonally fluctuating emergency storage requirement, which typically is at its highest in May and lowest in October. The Water Department's 2004 Strategic Business Plan recommends that the Council Policy on

Emergency Storage of Water be updated to reflect the impacts on emergency storage requirements given the Water Department's current strategic direction, which focuses on the development of alternative water supplies including the Water Authority's desalination efforts, groundwater, and recycled water.

4.3.3 Preparing for Emergency and Emergency Response

When responding to a water emergency that results in a shortage or cutoff of imported water, the Water Authority communicates and coordinates directly with Metropolitan. The Water Authority's Emergency Response Plan (ERP) provides direction to officials for responding to an emergency when severe damage to the Water Authority's distribution system occurs (such as earthquakes, fire, water system failures, contamination). When necessary, the ERP triggers activation of the Water Authority's Emergency Operations Center (EOC). Components of ERP include:

- Policies and procedures associated with emergency response activities.
- EOC activities.
- Multi-agency coordination (especially between the Water Authority, its member agencies and Metropolitan in accordance with Standardized Emergency Management System (SEMS)).
- Emergency staffing.
- Mutual aid agreements.
- Pre-emergency planning and emergency operations procedures.

Depending on water supply reduction requirements set by the Water Authority and Metropolitan in response to the emergency, the City may need to substitute for loss of imported water by taking water out of storage, alerting the public to the emergency, and enacting the appropriate water conservation stage as established in the City's Emergency Water Regulations. The City's Fire-Rescue Department maintains the City-wide EOC and Emergency Operations Plan (EOP), which is a template for all activities within the EOC during its activation. Fire-Rescue also maintains the Major Incident Response Plans (MIRPs) which include incident specific check lists for the Water Department. The Water Department is a signatory to two mutual aid agreements: (1) a Water Authority Agreement between the 23 member agencies and (2) a State-wide Water Agency Response Network (WARN). When necessary, additional personnel and equipment resources would be requested from other City departments first. If sufficient resources are not available, a request would be made to San Diego County, in accordance with SEMS. The San Diego County EOC would request resources outside the County, including WARN resources, if necessary.

4.3.4 Seismic Vulnerability

In 2001, the Water Department hired a consultant to conduct a seismic vulnerability assessment of the City's water system. The study reviewed regional seismology and geotechnical issues, and looked at potential impacts to the water system in the event of several probable earthquakes along the region's active fault lines. In this report, a Rose Canyon earthquake with a 6.5 magnitude was identified as the most probable significant seismic event that could occur in San

Diego. The study made key findings on the vulnerability of City pipelines, pump stations, water treatment facilities, and other system components. It evaluated impacts to the water system should the Water Authority's pipelines system suffer earthquake damage, and if the loss of offsite power supplied by SDG&E were to occur. It also included an analysis of the impact that post-earthquake fires would likely have on water system performance, and reviewed the Water Department's planned emergency response. Seismic improvements alternatives were developed by a consultant, and were categorized into four System Improvement Packages (SIPs). The extent of the improvements and the costs associated with the implantation of each SIP increased progressively, while the level associated risk to system performance during and after a seismic event progressively decreased with each SIP. SIP-1 had the lowest associated cost and highest performance risk, while SIP-4 had the highest cost and lowest risk. The Water Department is pursuing the set of improvements associated with SIP-3. Once the improvements included in SIP-3 are implemented, nine out of the ten water system service performance goals will be met under post earthquake conditions **(Appendix I)**. The Department is currently pursuing grant funding from the Federal Emergency Management Agency (FEMA) for the seismic retrofitting of water transmission mains. In addition, it is the Department's policy that upgrades to Seismic Zone 4 standards are made to existing facilities as they are replaced or improved, which meets the current seismic standard. Additional recommendations made in the assessment include conducting a comprehensive planning effort to mobilize field pipe repair crew after a major earthquake; initial and ongoing training of Water Department personnel for emergency response procedures; and initial testing of emergency response capabilities with comprehensive earthquake scenario exercises.

Water pressure throughout the system, and in particular at fire hydrants, will likely be compromised or unavailable should water lines rupture during an earthquake. This would be a problem for San Diego Fire-Rescue, especially if post-earthquake fires were to occur. As such, the Fire-Rescue Department has been advised to consider other water sources to fight fires under these circumstances, especially in areas of the city that are highly susceptible to liquefaction. The City of San Francisco and other international cities maintain emergency response plans that call for the use of sea water to fight post-earthquake fires.

4.3.5 Power Shortages

In the summers of 2001 and 2002, southern California experienced significant electric power shortages, resulting in rolling blackouts in the San Diego region. For the first time since World War II, the City experienced unscheduled service interruptions. The City's water distribution system and treatment plants continued to operate without interruption during these shortages. In response to these shortages, the California Independent System Operator established the Emergency Electric Load Curtailment Program (EELCP), provided in **Appendix J**, which is enacted during times of regional power shortages and outages. The program includes procedures that dictate how non-exempt entities, including the City of San Diego's Water Department, must reduce or suspend electric energy consumption during periods of shortage or outages. Because the nature of the service provided by the Water Department is essential to public health and safety (Police and Fire/Life Safety Departments are exempt entities under the EELCP), the Water Department attempted to change its status as a non-exempt entity to an exempt entity under the EELCP. The effort was unsuccessful, and therefore during shortages the Water Department

must follow EELCP protocol to reduce electrical power use, and then contact SDG&E to request power restoration to portions of the grid containing critical pump stations. The Water Department observes its own internal operating procedures during system interruptions, and conducts drills to simulate response plans when electricity shortages impact the water delivery system. In order to respond to short-term power outages, the Water Department has 16 emergency generators stored at various pump stations throughout the city and keeps numerous portable pumps on hand to respond to emergencies.

4.3.6 Public Information on Localized Emergencies

The Water Department recently enhanced its web site to include information for its customers on how to report and respond to a localized water emergency such as a leak in a main break, or fire hydrant knock-over. An on-line video and PDF brochure are available on the Department's web site, which provide important phone numbers and a step-by-step process on how to respond to a water emergency.

4.3.7 Enhanced Security Efforts

Over the past four years the Water Department has responded to the nation's increased threat of terrorism. Extensive confidential plans are being implemented to protect the City's municipal water system. Ongoing enhancements of security measures are being put in place to address and protect Department employees, facilities, and information. The Safety Section of the Water Department, in partnership with a private security company, has implemented a new access control system to improve accountability and monitoring capabilities, and limit access to various secured water system facilities. These are some, but not all, of the security efforts being pursued by the Water Department

4.4 PROHIBITIONS, PENALTIES, AND CONSUMPTION REDUCTION METHODS

4.4.1 Mandatory Prohibitions

The Act calls for a listing of the mandatory prohibitions against specific water use practices during water shortages. The City's Water Emergency Regulations stipulate that Water Department customers shall not make, cause, use, or permit the use of water from the City for any purpose in a manner contrary to the provisions made in the Code's Water Emergency Regulations section, or in an amount that exceeds that which is permitted within each of the activated conservation stages, as shown in **Table 4-1**. It is always unlawful for any person to waste water or to use it unreasonably. Unreasonable uses of water include, but are not limited to the following practices: (1) allowing water to leave the customer's property by drainage onto adjacent properties, roads or streets due to too much irrigation or leaks, (2) failure to repair a leak, and (3) use of water to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate safety or sanitation hazards.

Table 4-4 lists the mandatory prohibitions against specific water use practices during water shortages. The conservation efforts included in Stage 1 (Water Watch) are the same as those of Stage 2 (Water Alert). Participation in conservation efforts during Stage 1 is voluntary, and goes

into effect when the *possibility* exists that the Water Department will not be able to meet all of its demands for water by customers. Stages 2, Stage 3 (Water Warning), and Stage 4 (Water Emergency) require mandatory compliance.

TABLE 4-4

MANDATORY PROHIBITIONS	
Water Use Prohibitions*	**Stage When Prohibition is Mandatory**
Watering lawn and irrigating landscape (including construction meter irrigation) outside of designated hours and days without a hand-held hose with positive shut-off nozzle, hand-held container, or drip irrigation system. Commercial nurseries and sod farms are exempt.	Stage 2
Washing vehicle without a hand held bucket or hand-held hose with positive shut-off nozzle, except at commercial or mobile car wash, or commercial service station using high pressure washing equipment. Garbage and food transport trucks are exempt.	Stage 2
Overfilling swimming pools, spas, ponds, artificial lakes	Stage 2
Irrigation of golf courses, parks school grounds, recreation fields outside of designated hours on designated days.	Stage 2
Use of water from fire hydrants, except for fighting fires or activities maintaining public health, safety, welfare.	Stage 2
Serving water in restaurants unless requested by customer.	Stage 2
Washing down sidewalks, driveways, parking lots, tennis courts, patios or other paved areas except to alleviate fire and sanitation hazards	Stage 2
Operation of ornamental fountains that do not recirculate water.	Stage 2
Metered construction operations using water for purposes other than those required by regulatory agencies. Projects requiring water for new landscape should adhere to designated irrigation hours.	Stage 2
Watering lawn and landscape with a handheld hose. Drip irrigation and hand-held container is permitted.	Stage 3
Water used by commercial nurseries beyond the amount determined by the City Council	Stage 3
Washing vehicles outside of designated hours or days with a hand-held bucket or positive shut-off nozzle for quick rinses.	Stage 3
Filling or refilling ponds and artificial lakes	Stage 3
Operation of ornamental fountains except for short periods of time to prevent damage.	Stage 3
Issuance of a new construction meter unless an old meter is returned, keeping number of authorized meters at existing level. Construction projects maintaining health, safety, and welfare are excluded from count.	Stage 3
Use of water for commercial manufacturing or processing beyond the amount determined by the City Council. Businesses exempt from water restrictions pursuant to section 67.3805(b)**	Stage 3
All outdoor irrigation of turf and ground covers except rare or exceptionally valuable plant material or plants essential to the well being of the public at large or rare animals.	Stage 4
Irrigation of trees except with hand-held hose with positive shut-off nozzle, hand-held container, or drip irrigation. Graywater may be used in accordance with Health Department regulations to water fruit trees, ground covers and ornamental shrubs and trees.	Stage 4
Washing all types of vehicles is prohibited. The use of water by all types of commercial car washes and service stations beyond the amount determined by the City Council, unless necessary to maintain the public's health safety and welfare.	Stage 4
Filling or refilling of swimming pools and spas.	Stage 4
Watering of all golf courses, except greens.	Stage 4
Sales of non-recycled water outside City limits, except for sales previously approved by the City Council.	Stage 4

Issuance of construction meters.	Stage 4
Water used for road or earthwork construction, except projects that are needed to maintain public's health, safety, and welfare.	Stage 4
New building permits will not be issued, except for: projects necessary to protect public's health, safety, and welfare, projects using recycled water, when the permit recipient can demonstrate no net increase in water use, or when permit recipient provides conservation offset, as defined in section 67.3806(13)(d).	Stage 4

* These water conservation measures apply except when using recycled water instead of potable water.
** See SDMC, section 67.3805 in **Appendix K**

4.4.2 Consumption Reduction Methods

Prohibitions enacted to bring significant reductions in water consumption during times of extreme water shortage are included in Stages 3 and 4 of **Table 4-4.** These measures apply only when using potable water (not recycled water), and include prohibiting the issuance of construction meters and building permits; watering golf courses (except greens); filling and refilling of swimming pools, spas, fountains and ponds; and washing vehicles. The current Emergency Water Regulations do not assign percentage values that correlate with anticipated demand reductions resulting from activation of each stage. Rather, as specific conservation stages are sanctioned during emergencies or drought, the Water Department and City Manager will closely monitor projected supply availability and demand. Depending on those projections, the proportionate demand management efforts presented in **Table 4-4** will be enacted and enforced.

4.4.3 Penalties and Charges

This segment of Water Shortage Contingency Plan calls for discussion of excessive water use penalties or charges for excessive water use. The Water Department maintains numerous proactive strategies, policies and laws that encourage the conservation of water on a daily basis. An example of this is the tiered water rate structure in which residential water rates progressively increase after monthly potable water use exceeds 14 hundred cubic feet (HCF), and increases once again when monthly water use exceeds 28 HCF. The Water Department also has a proactive leak detection program to minimize water waste caused as leakage and theft, and maintains an ordinance requiring that homes be retrofitted with low flow plumbing fixtures upon resale or permitted remodel.

The SDMC's Emergency Water Regulations stipulates in 67.3806 that it is unlawful for any customer of The City of San Diego Water Department to make, cause, use or permit the use of water from the City for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of sections 67.3801-67.3811, or in an amount that exceeds what is permitted by the conservation stages in effect as directed by the City Manager or his designee and in accordance with the provisions of sections 67.3801-67.3811 (**Appendix K**). It is always unlawful to waste water or to use it unreasonably.

Violation of these provisions is considered a misdemeanor subject to penalties provided in section 12.0201 and 12.0202 of the Code (**Appendix L**). Misdemeanors carry a maximum fine of $1,000, and a fine of up to $250 will apply upon first conviction A fine of up to $500 will

apply upon a second or any subsequent conviction that occurs within a one-year period. Non-compliance with water reduction efforts specified in mandatory conservation Stages 2, 3 and 4, as established by the City Manager, is subject to fines. Charges will apply as a separate offense for each day a Code violation is committed. The Water Department can also seek an injunction from the Superior Court pursuant to SDMC section 12.0202, or may pursue any administrative remedy provided in Chapter 1. Section 67.3808 states that, "In addition to any other remedies the Water Department may have for the enforcement of the Code, service of water shall be discontinued or appropriately limited to any customer who willfully uses water in violation of any provisions in this Division."

4.5 ANALYSIS OF REVENUE IMPACTS OF REDUCED SALES

This section of the Plan describes how planned consumption reduction methods, penalties, and prohibitions are likely to impact revenues and expenditures. In the case of a prolonged water shortage when a reduction in water consumption is planned, or in an emergency when it is unplanned, Water Department revenues and expenditures will be impacted by the reduction in water sales. Furthermore, any interruption or reduction in imported or local water supply will impact the volume of water available for sale. In turn, revenues to the Water Enterprise Fund will also be impacted. Any reduction in revenues will likely require rate increases to operate the water system and maintain the minimum debt coverage ratio required by covenants related to outstanding debt. It is anticipated that any rate increase would take the form of a percentage increase on the commodity charge and/or base fee, which would impact all customers. Rate increases that are not the result of an increase in the cost of purchased water or energy require the approval of the City Council.

In order to mitigate the financial impacts of a water shortage, the City would evaluate its operations and maintenance budget for possible deferrals, the use of emergency storage water and the use of one or more of the available reserve funds. In prior years, previously appropriated capital project funding could have been reallocated to meet short-term emergency needs; however, going forward it would be necessary to evaluate whether or not bond covenants require proceeds to be used exclusively for capital projects. There are currently three reserve funds that could be utilized in the event of a water shortage. The first is the Secondary Purchase Reserve, which is intended to be equal to six percent of the annual water purchase budget. This is intended to be an emergency reserve for the purchase of water in the event of drought or other emergency that suddenly disrupts the normal supply of water. The second is a 45-day Operating Reserve, which is intended to provide for unanticipated needs that arise during each year and would include any disruption in the normal supply of water. The third is the Rate Stabilization Fund, which is intended to provide a source of funds to mitigate future rate increases. Deposits into this fund are at the discretion of the City and are made from current system revenues.

Without the use of these reserves or emergency storage water, it would be necessary to increase rates by 20 to 50 percent in the year that there is a 50 percent reduction in water that is available for sale. The use of the reserves will still require rate increases since the reserves would need to be replenished, but the increases could be spread over more than one year. The timing and the amount of the reserves used would be evaluated based on the significance of the rate increases,

the ability to reduce operation and maintenance costs, the availability of emergency storage water, the timing of additional debt issuances, and the possibility of a debt rating downgrade.

DWR's 2005 UWMP Guidelines ask urban water utilities to specify the measures that could be taken to help the utility overcome revenue and expenditure impacts resulting from a planned reduction in water consumption during supply shortages and water rationing. **Table 4-5** summarizes those measures and associated effects.

Table 4-5
OVERCOMING REVENUE & EXPENDITURE IMPACT FROM PLANNED CONSUMPTION REDUCTION DURING SHORTAGES

Name of Measure	Summary of Effects
Use of emergency storage water during times of shortage.	Make water available to avoid revenue reduction from decreased sales and expenditure increases to purchase imported water.
Use of proceeds from capital project funding (if permitted by bond covenants).	Meet short-term emergency needs.
Use of Secondary Purchase Reserve.	Allow the purchase of water during drought or other disruption of normal supply.
Use of 45-Day Operating Reserve.	Provide for unanticipated needs when normal water supply is disrupted.
Use of Rate Stabilization Fund.	Provide a source of funds to mitigate future rate increases.
Council approved rate increase.	Provide additional revenues when water sales decline or expenditures increase. Replenish reserve funds.
Reductions in expenditures through possible deferrals.	Reduce current operational expenditures to compensate for reduction in water sales revenue or increased expenditures. Delay in O & M and capital improvements.
Use of emergency storage water and other local water sources.	Provide protection against potential higher cost or surcharge on imported water during shortages.
Use of Federal and State disaster loans.	Mitigate the impact of increased expenditures resulting from staff and public education outreach efforts and potential increase in cost of water during shortage.

4.6 WATER USE MONITORING PROCEDURES

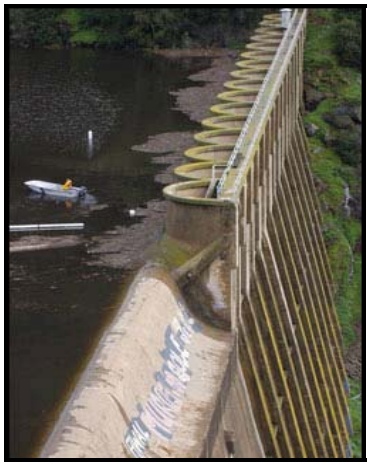
The City of San Diego's Emergency Water Regulations has been most recently updated in 1998. **Appendix K** of the Municipal Code includes the Emergency Water Regulations, section 67.3801-67.3811.

During periods of emergency or drought when implementation of the mandatory conservation phases are enacted, Section 67.3807 of the Emergency Water Regulations requires the Water Department to monitor the projected supply and demand for water by its customers on a daily basis, and will recommend to the City Manager the extent of the conservation required through implementation or termination of the conservation stages to prudently plan and supply water to its customers. **Table 4-6** outlines the mechanisms and data sources that are available to management for monitoring the actual reductions in water use that have occurred when water rationing is enacted and enforced.

TABLE 4-6
WATER USE MONITORING MECHANISMS

Mechanism for Determining Actual Reductions	Type and Quality of Data Expected
Review of daily water consumption records kept by Water Operations Division staff.	System-wide daily water consumption data.
Review of daily wastewater treatment records kept by Metropolitan Wastewater Department staff.	Water treatment data will provide amount of indoor water used and treated on a City-wide basis. Data will not be broken down by category, and outdoor water use will not be captured in this data.
Monitoring of certain sectors that have limitations set on water use by City Council… such as commercial nurseries and sod farms, car washes that don't use recycled water, commercial manufacturing and processing,	The potential exists for meters to be read more frequently, such as daily or weekly.

Increased meter reading by Customer Support meter reading staff.	Additional meter reads could provide current water consumption data that would enable Council to enact specific reduction requirements as needed (i.e. sod farms, plant nurseries). Additional opportunity to monitor customers with meters that can be read by computer may become available once the City has implemented automated meter reading.



SECTION 5 – RECYCLED WATER PLAN

5.1 COORDINATION

Water is essential to San Diego's economy, quality of life and world-famous environment. The City's current population of 1.3 million will grow to an estimated 1.7 million in 2030. By that time, San Diego will need 25 percent more water than it uses now.

Up to 90 percent of the City's existing water supply is imported water from the Colorado River and the California State Water Project. The City purchases its water supply from the Water Authority and the Water Authority purchases its water from Metropolitan. The City of San Diego Metropolitan Wastewater Department (MWWD) collects and treats wastewater from the City and 15 surrounding municipalities and sewer districts.

TABLE 5-1
PARTICIPATING AGENCIES

Participating Agencies	Role in Plan Development
Metropolitan Water District of Southern California	Water Wholesaler
San Diego County Water Authority	Water Wholesaler
City of San Diego Water Department	Water Purveyor
City of San Diego Metropolitan Wastewater Department	Wastewater Conveyance and Treatment

The Metropolitan Water District of Southern California

Metropolitan is a consortium of cities and water districts that provides drinking water to nearly 18 million people in parts of the Los Angeles, Orange, San Diego, Riverside, San Bernardino, and Ventura Counties.

The mission of Metropolitan is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically reasonable way.

Metropolitan currently delivers an average of 1.7 billion gallons of water per day to 5,200 square-miles of service area.

The San Diego County Water Authority

As a water wholesaler, the Water Authority's mission is to provide a safe and reliable supply of water to its 23 member agencies in the San Diego region. The agencies are represented through the board of directors. A member of the San Diego County Board of Supervisors also serves as a representative to the Water Authority board of directors.

The Water Authority was formed in 1944 by the California State Legislature, and operates under the County Water Authority Act, which can be found in the California State Water Code. The Water Authority is one member of Metropolitan and in its 60-year history the Water Authority has come to supply up to 90 percent of San Diego County's water.

The City of San Diego Water Department

As a water purveyor, the City of San Diego Water Department provides water to more than 250,000 metered service connections within its own incorporated boundaries. In addition, the San Diego Water Department conveys and sells potable water to the City of Del Mar, the Santa Fe and San Dieguito Irrigation Districts, and the California American Water Company, which, in turn, serves the Cities of Coronado and Imperial Beach and portions of south San Diego. The San Diego Water Department also maintains several emergency connections to and from neighboring water agencies, including the Santa Fe Irrigation District, the Poway Municipal Water District, and Otay Water District, the California American Water Company, and the Sweetwater Authority.

City of San Diego Metropolitan Wastewater Department

The Wastewater Collection Division of the City’s MWWD maintains the municipal sewage collection system within the City. The collection system consist of 55,000 sewer manholes, over 2,987 miles of sewer mains, 88 sewer pump stations and 54 storm water interceptor stations, with approximately 10 percent of the sewer lines located in canyons and open space. The sewer main diameters range from 4 inches to 102 inches.

The Metro System treats approximately 180 million gallons of wastewater per day generated in a 450 square mile area by more than 2.2 million residents within the City of San Diego and 15 other cities and districts (called Participating Agencies). This wastewater is treated at the Point Loma Wastewater Treatment Plant (PLWTP), the NCWRP or the SBWRP. The Participating Agencies are the Cites of Chula Vista, Coronado, Del Mar, El Cajon, Imperial Beach, La Mesa, National City, Poway, the Lemon Grove Sanitation District, the Otay Water District, the Padre Dam Municipal Water District, the County of San Diego (including Lakeside/Alpine, Spring Valley, Wintergardens, and East Otay Mesa).

5.2 WASTEWATER QUALITY, QUANTITY AND CURRENT USES

The City’s MWWD is responsible for transporting the San Diego region’s wastewater to the PLWTP or one of the two water reclamation plants. The PLWTP is located on a 40 acre site on

the bluffs of Point Loma; the plant has a treatment capacity of 240 MGD.

POINT LOMA WATER TREATMENT FACILITY

In compliance with federal and state laws, the PLWTP processes wastewater at an advanced primary treatment level. Wastewater moves from Pump Station 2 on Harbor Drive to the top of Point Loma. From there, gravity takes hold and the wastewater (called "influent") flows into the headworks of the plant. The foul air from the influent passes through an odor control system which "scrubs" the foul smelling air with a bleach solution. The scrubbed air then passes through carbon filters before being released. There are 11 other odor control systems throughout the plant that operate during every stage of the treatment process. The wastewater then passes through screens which act as giant rakes to remove non-organic materials that would interfere with the treatment process.

ODOR CONTROL SYSTEMS

Following grit removal, the wastewater is pumped into sedimentation tanks. Ferric chloride and organic polymers are added to the wastewater to help waste particles bond together in a large enough mass that will settle our. Organic solids settle to the bottom of the tanks and "scum"

(primarily cooking grease and oil) float to the surface. At this stage, approximately 80 percent of the total suspended solids in the water have been removed. After a final screening, the treated wastewater, called "effluent," is discharged to the ocean through the 4.5 mile long Ocean Outfall. The Outfall ends in 320 feet of water and splits into a Y-shaped diffuser to ensure wide dispersal of effluent into ocean waters.

TABLE 5-2
WASTEWATER COLLECTED AND TREATED
(AF YEAR)

	2000	2005	2010	2015	2020	2025	2030
Wastewater collected & treated in service area	225,579	247,048	271,753	298,928	328,821	361,703	397,873
Quantity that meets reclaimed water standard	11,886	8,759	13,139	16,029	19,555	20,000	20,000

TABLE 5-3
WASTEWATER DISPOSAL METHOD
(AF YEAR)

Method of Disposal	Treatment Level	2005	2010	2015	2020	2025	2030
Ocean	Primary or better	251,068	232,273	253,178	268,369	281,787	295,876
TOTAL		**251,068**	**232,273**	**253,178**	**268,369**	**281,787**	**295,876**

Water Recycling: Wastewater Generation, Collection, & Treatment

Wastewater treatment occurs not only at the PLWTP, but also in several reclamation plants throughout the service area.

5.2.1 North City Water Reclamation Plant

North City Water Reclamation Plant Recycled Water Availability and Use

The NCWRP, operated by the City's Metropolitan Wastewater Department, currently treats an average wastewater inflow of 22.5 MGD, which is 75 percent of its capacity. Of this amount, approximately 6 MGD of tertiary-treated recycled water is produced and beneficially reused on average per year. The remaining flow is treated to a secondary level and returned to the sewer system where it mixes with untreated wastewater as it is conveyed to the PLWTP for treatment.

The existing recycled water distribution facilities owned and operated by the Water Department, in place to serve the northern service area, include a 9 million gallon storage tank, two pump

stations, and about 66 miles of pipeline, including a large backbone pipeline to Miramar Road. These facilities extend from the coast to the City of Poway.

As of July 2005, the City provides recycled water to 351 meters, including a single meter connection with the City of Poway by which Poway subsequently serves an additional 191 customers. Most of these customers use recycled water for irrigation while a few customers use recycled water for industrial purposes. Large City customers include the NCWRP, Metropolitan Biosolids Center, Miramar Landfill, City maintained open space parkland, and the Torrey Pines Golf Course. Other large customers include General Atomics, Caltrans, Miramar Nursery, San Diego California Temple, University of California at San Diego, and Miramar Marine Corps Air Station Golf Course. Infill opportunities exist for perhaps 150 to 200 additional irrigation customers that could connect to the existing northern service area system, including public parks, freeway medians, and private customers that could use 0.5 to 20 AFY.

NORTH COUNTY WATER RECLAMATION PLANT

TABLE 5-4
RECYCLED WATER USE IN SAN DIEGO
(AF YEAR)

Type of Use	Treatment Level	2005
Agriculture		0
Landscape	Tertiary	2,134
Wildlife Habitat		0
Wetlands		0
Industrial	Tertiary	1,693
Groundwater Recharge		0
Other - Wholesale	Tertiary	467
TOTAL		**4,294**

Planned NCWRP Distribution System Expansions

The City plans to expand the existing recycled water distribution system to connect to additional customers. Previous plans developed by the City have divided the expansion into three phases known as; Phase I, Phase II, and Phase III. The major facilities associated with these expansions are shown in **Figure 5-1**. The City is currently completing the Phase I and II expansions. Phase III of the expansion has not been funded.

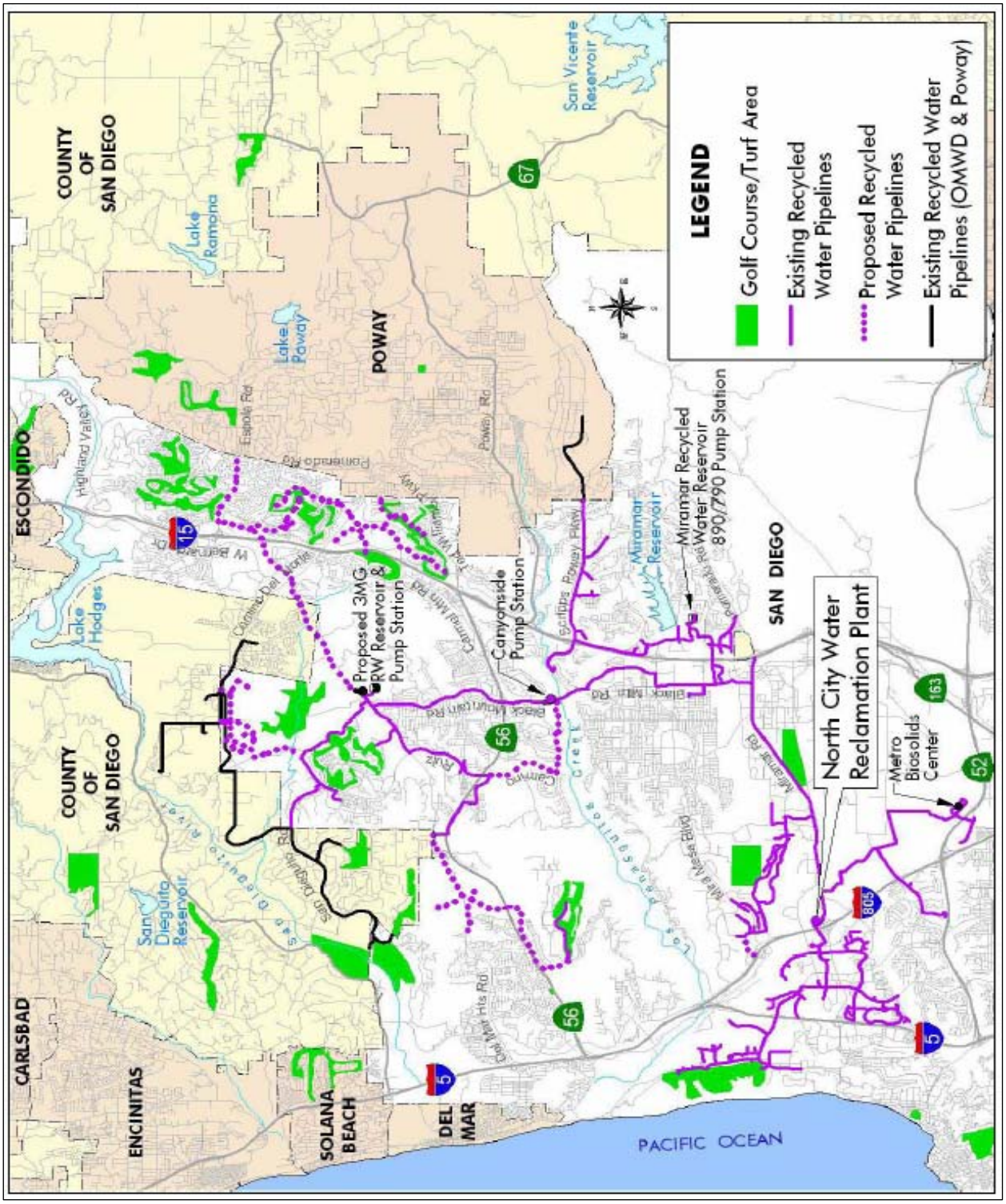
Phase I of the recycled water system expansion will be completed in 2005. New customers will include the Black Mountain Ranch golf courses and parks, and the Olivenhain Municipal Water District. Thirteen miles of pipeline have been installed through the Rancho Penasquitos community to the Black Mountain Ranch area and a pump station has been constructed. In addition, to further serve the area, the 3 million gallon Black Mountain Reservoir was recently completed. Phase I customers are anticipated to generate an initial recycled water demand of approximately 2,000 AFY (1.8 MGD) with the 2004 improvements and a total of 3,300 AFY (2.9 MGD) after 2006.

Phase II of the recycled water system expansion will be completed in 2010. Service to Carmel Valley and the State Route 56 corridor comprises Phase II of the system expansion. The 16 miles of pipeline needed to implement this phase are under various stages of design or construction and is dependent on the timing of construction of the associated new development in the area. This area would be served by branching off of the Black Mountain Road recycled water main at Canyonside Park in Los Penasquitos Canyon, and merging with the SR-56 alignment at Camino Ruiz. The terminal point is the Del Mar National Golf Club in Carmel Valley. Other significant customers will be served along the way, including Caltrans, Pacific Highlands Ranch, and the Palacido Del Mar Golf Course. Recycled water use along this corridor is anticipated to generate

a recycled water demand of approximately 1,000 AFY (0.9 MGD) when the entire length of pipeline is completed.

The Phase III service area includes the Rancho Bernardo/Interstate 15 corridor. This area is densely populated and built out, but has numerous parks and golf courses that would benefit from recycled water service. The recycled water demand in this service area, including two golf courses in Poway, is estimated to be approximately 1,800 AFY (1.6 MGD). Providing service to this area would require an investment in 17 miles of pipeline, a pump station, and the instillation of at least one large storage reservoir. These facilities are in the planning stage and their implementation may be subject to a cost benefits analysis associated with recycled water use opportunities.

FIGURE 5-1
NORTH CITY RECYCLED WATER DISTRIBUTION SYSTEM



5.2.2 South Bay Water Reclamation Plant

South Bay Water Reclamation Plant Recycled Water Availability and Use

The 15 MGD SBWRP became operational in the summer of 2002. It currently produces up to 9 MGD of secondary treated wastewater that is disposed of via an ocean outfall. Certification of the tertiary treatment facilities by the Regional Water Quality Control Board (RWQCB) was granted in 2004.

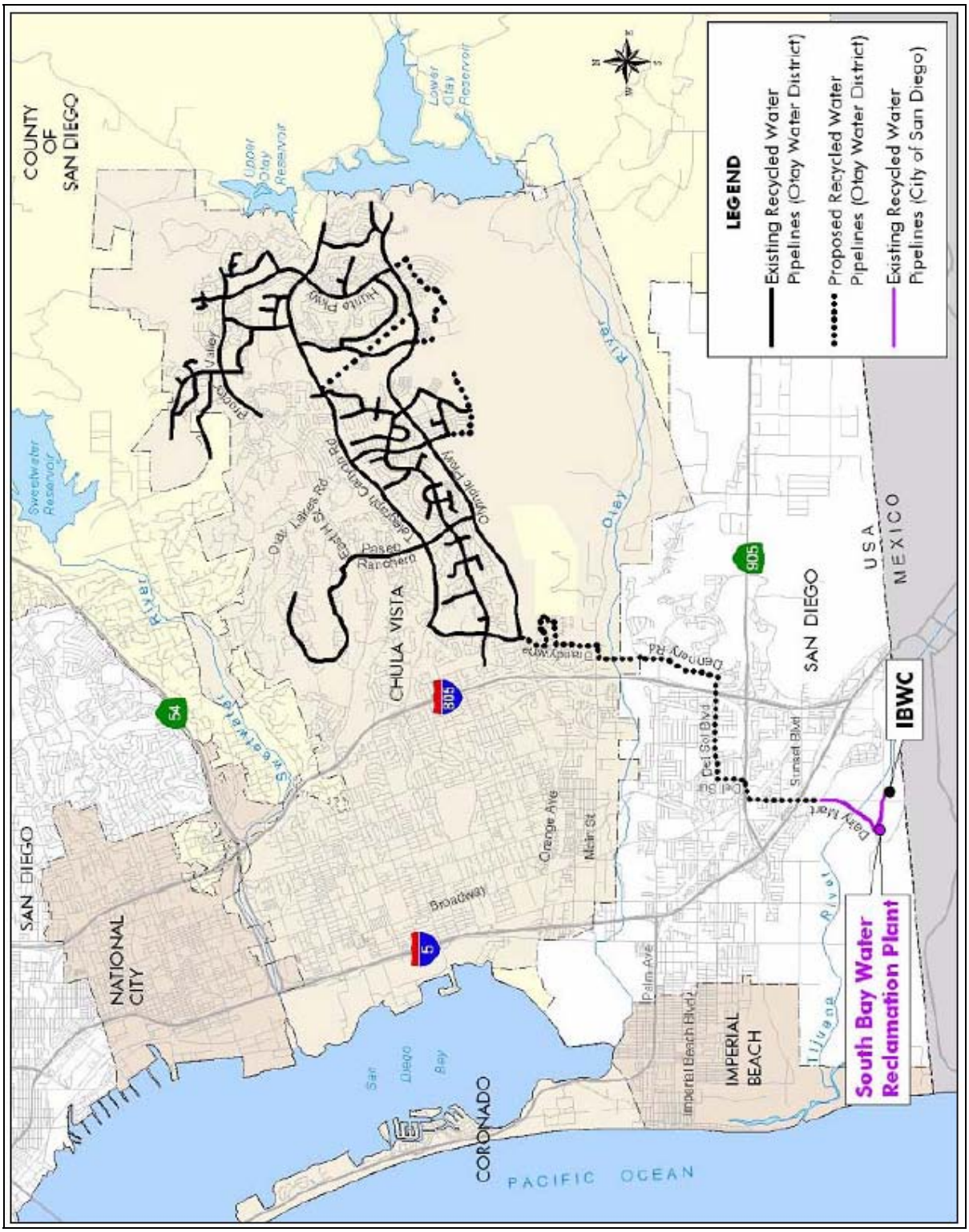
The South Bay Distribution System owned and operated by the Water Department, consists of a pipeline in Dairy Mart Road that will eventually connect to the facilities being constructed by the Otay Water District. Construction of facilities was recently completed to deliver 0.7 MGD of recycled water to the adjacent International Boundary and Water Commission (IBWC) Wastewater Treatment Plant.

Planned SBWRP Distribution System Expansion

On October 16, 2003, the San Diego City Council executed an agreement to sell 6 MGD of recycled water to the Otay Water District. The Otay Water District will have infrastructure in place to take this water by January 1, 2007. In addition, Caltrans has expressed interest in using recycled water for freeway landscape irrigation at the southern ends of Interstates 5 and 805, and the 905 interchange. **Figure 5-2** shows the facilities that comprise the distribution system for the South Bay area.

SOUTH BAY WATER RECLAMATION PLANT

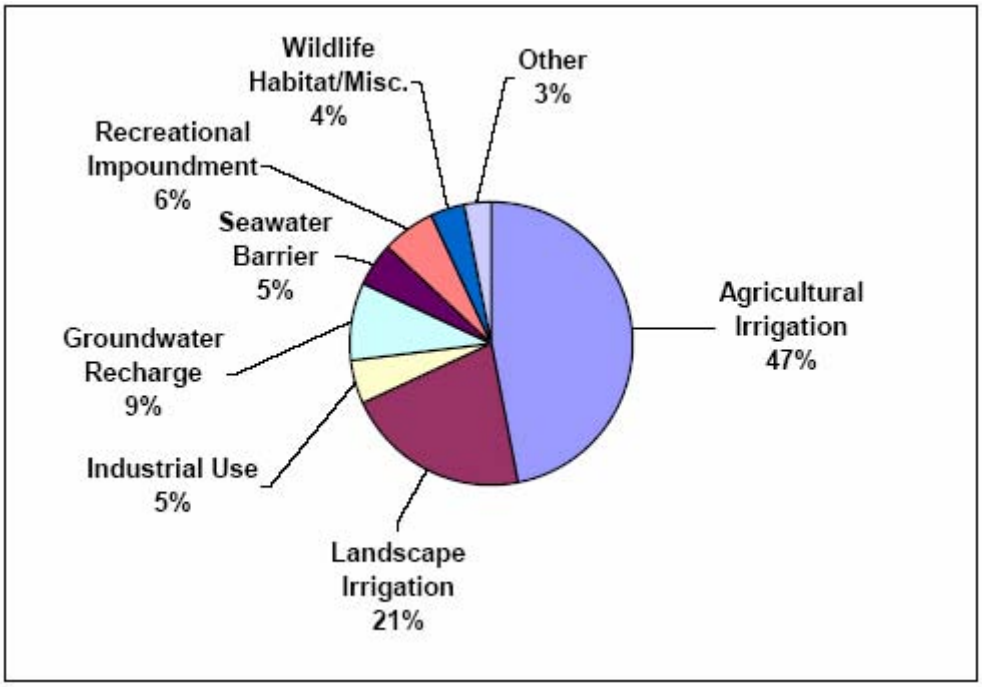
FIGURE 5-2
SOUTH BAY RECYCLED WATER DISTRIBUTION SYSTEM



5.3 POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES

Non-potable recycled water use represents the largest and most successful type of water reuse to date in California. Non-potable reuse typically uses recycled water that meets California water quality standards for uses that are not associated with drinking water, such as irrigation, industrial uses and wetlands creation. Non-potable applications have been proven safe, reliable and effective at reducing the need for potable water, particularly during peak summer months. The California State Water Resources Control Board estimates that nearly 550,000 AF of water was recycled in California during 2003. This includes both non-potable uses, such as irrigation and indirect potable use, such as groundwater recharge. The City of San Diego produces water that is primarily used for irrigation and industrial processes. **Figure 5-3** illustrates a recent breakdown for each category of use within the State of California.

FIGURE 5-3
2003 CALIFORNIA RECYCLED WATER USE BY CATEGORY



Source: Adapted from California State Water Resources Control Board data

5.3.1 Non-potable Uses

Agricultural and Landscape Irrigation

As illustrated in **Figure 5-3**, the primary non-potable use of recycled water in California is irrigation. Salinity, sodium, inorganic elements, chlorine residual, and nutrients are the primary constituents of concern when using recycled water for agricultural irrigation. Although the presence of nutrients in recycled water is generally appreciated by irrigation customers and is beneficial to plant growth, excess amounts of salinity can be harmful to plants or have long-term adverse effects on soil.

Industrial Uses

Industrial uses account for approximately five percent of the recycled water use in California. There are a variety of industrial applications suited for recycled water use. For many industries, cooling water for commercial air conditioning systems comprise the largest use of recycled water. Power plants (including geothermal energy) and refineries can use substantial amounts of cooling water. Cooling water use is also beneficial in that it typically has a more constant demand compared to landscape irrigation. Boiler water make-up is another opportunity; however the amount of recycled water used is typically small unless there is a large user (such as a refinery). Dual-plumbed buildings are another option where recycled water is supplied to toilets and urinals.

Another industrial use for recycled water is the replacement of evaporated water in commercial boilers. Recycled water would be used to replace water lost due to steam generation or evaporation. Often per-treatment of the recycled water is required to further reduce hardness and other inorganic contaminants that form scale in boiler systems (like that formed in hot water heaters over time). Generally, boiler systems with higher operating pressures require higher quality water. Some municipalities even offer a range of recycled water qualities for industrial uses, charging a premium for very high quality (RO treated) boiler-ready water.

Other Non-potable Uses

The remaining non-potable uses of recycled water represent either a much smaller amount of overall reuse potential or an application that is difficult to implement in San Diego. In general, these opportunities include private residential landscape irrigation, wildlife habitat enhancement (wetlands creation), recreation impoundments (lakes or ponds), and other uncommon or specialized uses.

Private Residence Landscape Irrigation Use

Irrigation of single-family lots with recycled water is allowed in California. The most notable, recent example is located in Northern California's El Dorado Irrigation District, just east of Sacramento. Private residential use of recycled water has been discouraged locally by the San Diego County Department of Environmental Health because of concerns regarding homeowner maintenance and cross-connection control. To overcome these concerns for the El Dorado

project, a homeowner's associate was formed which manages the use of recycled water for landscape irrigation.

Recreation Impoundment and Wildlife Enhancement Uses

Environmental and recreation applications include wetland restoration and enhancement as well as incidental contact (fishing, boating) and direct contact (swimming, wading) uses. California allows recycled water use for these applications but restricts its use depending upon the likelihood and degree of body contact; unrestricted recreational uses require disinfected tertiary recycled water and extra monitoring for pathogens (Giardia, Cryptosporidium and viruses). In San Diego, Padre Dam Municipal Water District uses recycled water in their Santee Lakes Recreation Preserve.

Miscellaneous Uses

Although recycled water is used elsewhere in California for fire protection, snowmaking, construction/dust control, street sweeping, car washes and commercial laundries, these uses are generally small. With the exception of snowmaking, San Diego could use recycled water for these activities if these agencies and commercial enterprises expressed interest and the activities were located in the vicinity of recycled water facilities. However, these uses are insignificant compared to the other opportunities presented. At the discretion of the City and the specific potential customers, these uses may be implemented in San Diego.

Wholesale Customers

Non-potable reuse opportunities extend well beyond the City borders. The City has existing regional customers such as the City of Poway, Olivenhain Municipal Water District and the Otay Water District. Expansion in these agency systems, or new interconnections to agencies such as Santa Fe Irrigation District and the Sweetwater Authority could expand non-potable water reuse.

5.3.2 Indirect Potable Reuse

Every wastewater plant discharging into the Mississippi River contributes to the water supply for downstream cities. Similarly, wastewater treatment facilities operated by cities in the Colorado River basin or in the Sacramento/San Joaquin delta discharge back to the rivers. This water supply is subsequently withdrawn by Metropolitan and distributed to water districts throughout the region. The Department of Health Services (DHS) does not consider such use indirect potable reuse (IPR) unless the wastewater comprises more than five percent of the total water (California DHS, Bob Hultquist, personal communication, 2005).

The term indirect potable reuse is highly treated recycled water that is discharged into either groundwater or surface water that ultimately supplies a public drinking system. Because it is intended for human consumption, this use receives a much higher degree of treatment than recycled water that is used for non-potable purposes.

The highly treated recycled water blends with the groundwater or surface water (which is usually imported water and local runoff) during a long retention time. The term "indirect" refers to the distinction that the highly treated recycled water is not plumbed directly to the potable distribution system.

All indirect reuse projects in California require extensive planning, permitting, and interaction with regulators. In IPR projects, all indications are that the finished water is of higher quality than most surface waters used as sources of drinking water in the United States.

As there are no significant rivers in the San Diego vicinity, our treated wastewater is discharged to the ocean. To recycle our treated wastewater for indirect potable reuse there are three basic types of projects that could be employed in San Diego:

- Groundwater Recharge-Spreading
- Groundwater Recharge-Injection
- Reservoir Augmentation

Groundwater Recharge – Spreading

Surface spreading is a direct recharge method where recycled water is released into open basins and the water seeps down into the groundwater basin. It is used generally when enough land area is available, certain soil conditions are present, and if the groundwater basin is "unconfined", that is water moves through the basin. Spreading of recycled water for groundwater replenishment has occurred in Los Angeles and Orange Counties for many decades.

Groundwater Recharge – Injection

A more complex means of adding to groundwater resources is through injection. Recycled water injection simply pumps the recycled water down to the groundwater, bypassing the soil percolation step. Because direct injection introduces recycled water directly into the groundwater, it does not provide the treatment that percolation provides. Accordingly, the injected water must be of higher quality than that used for surface spreading. Some states require treatment to drinking water standards. Injection of recycled water into groundwater basins has occurred in Los Angeles County (West Basin Municipal Water District) since 1995 and in Orange County since the 1970's.

Reservoir Augmentation

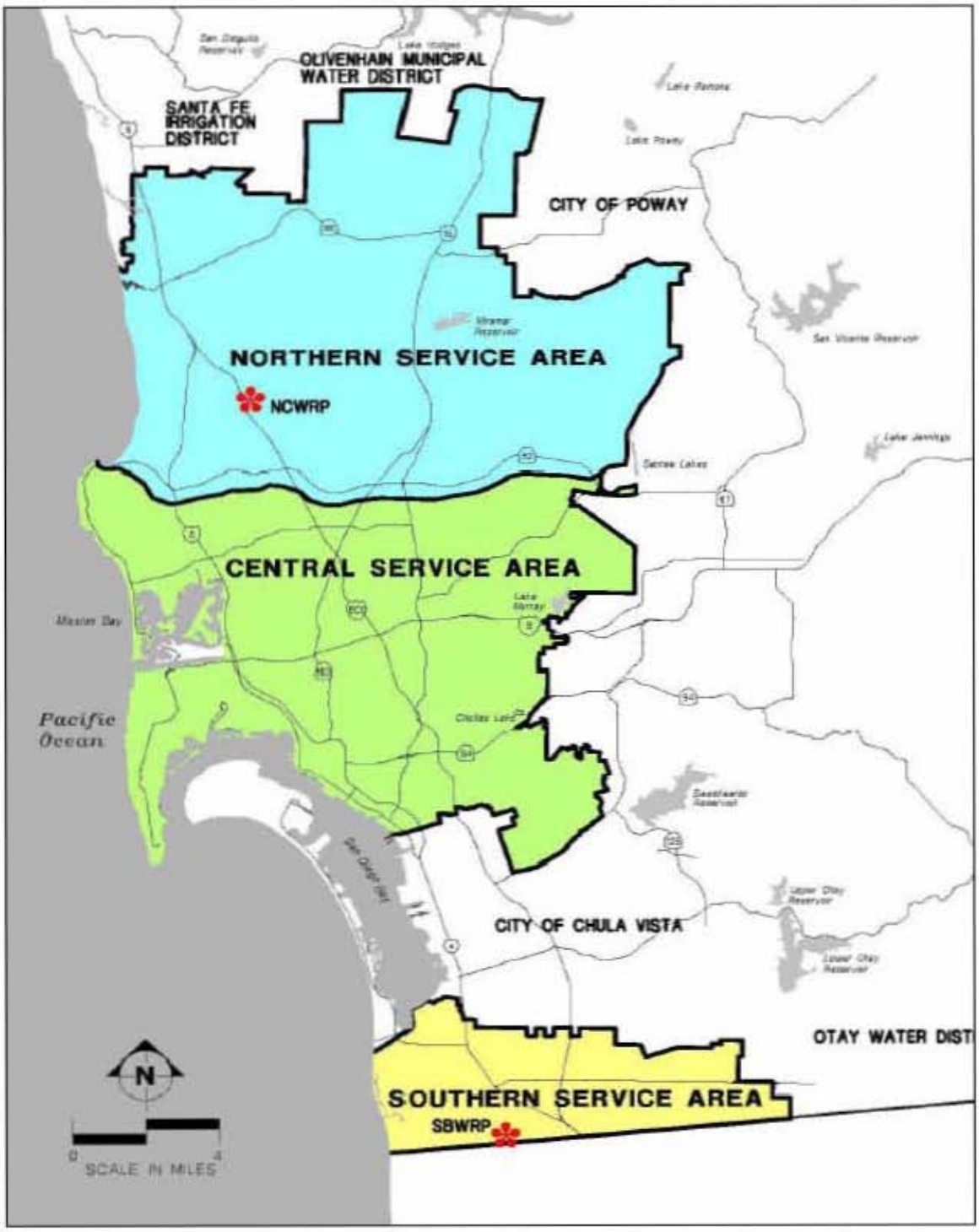
Reservoir augmentation adds highly treated recycled water directly to a water reservoir to increase the overall water supply. Water used in reservoir augmentation projects would undergo advanced treatment and disinfection. In addition to the advanced treatment, reservoir augmentation projects also allow the treated water to reside under natural environmental conditions for a period of time. This retention time provides an additional public health barrier, as natural reduction of trace contaminants due to microbial degradation, oxidation, and dilution occurs. The reservoir water would ultimately be pumped out and treated by a potable water

treatment plant and used for drinking purposes. Reservoir augmentation has been in use at Occoquan, Virginia since 1978.

5.3.3 San Diego Non-Potable Reuse Opportunities

There were three service areas identified in the City of San Diego for potential non-potable reuse opportunities (**Figure 5-4**). In each service area the initial focus was on irrigation and industrial customers because those types of customers generally use significant amounts of water. The identification of any additional non-potable opportunities was targeted at capturing smaller potential customers located near existing infrastructure or branching out to areas currently not served by the existing system. Wetlands creation projects were investigated for the use of recycled water during winter months to stimulate storm events in canyon streams. Seasonal storage facilities were considered in each service area. Regional opportunities, including the sale of recycled water by the City to neighboring municipalities or water districts, were identified.

FIGURE 5-4
EXISTING AND PROPOSED RECYCLED WATER SERVICE AREAS



Northern Service Area Recycled Water Opportunities

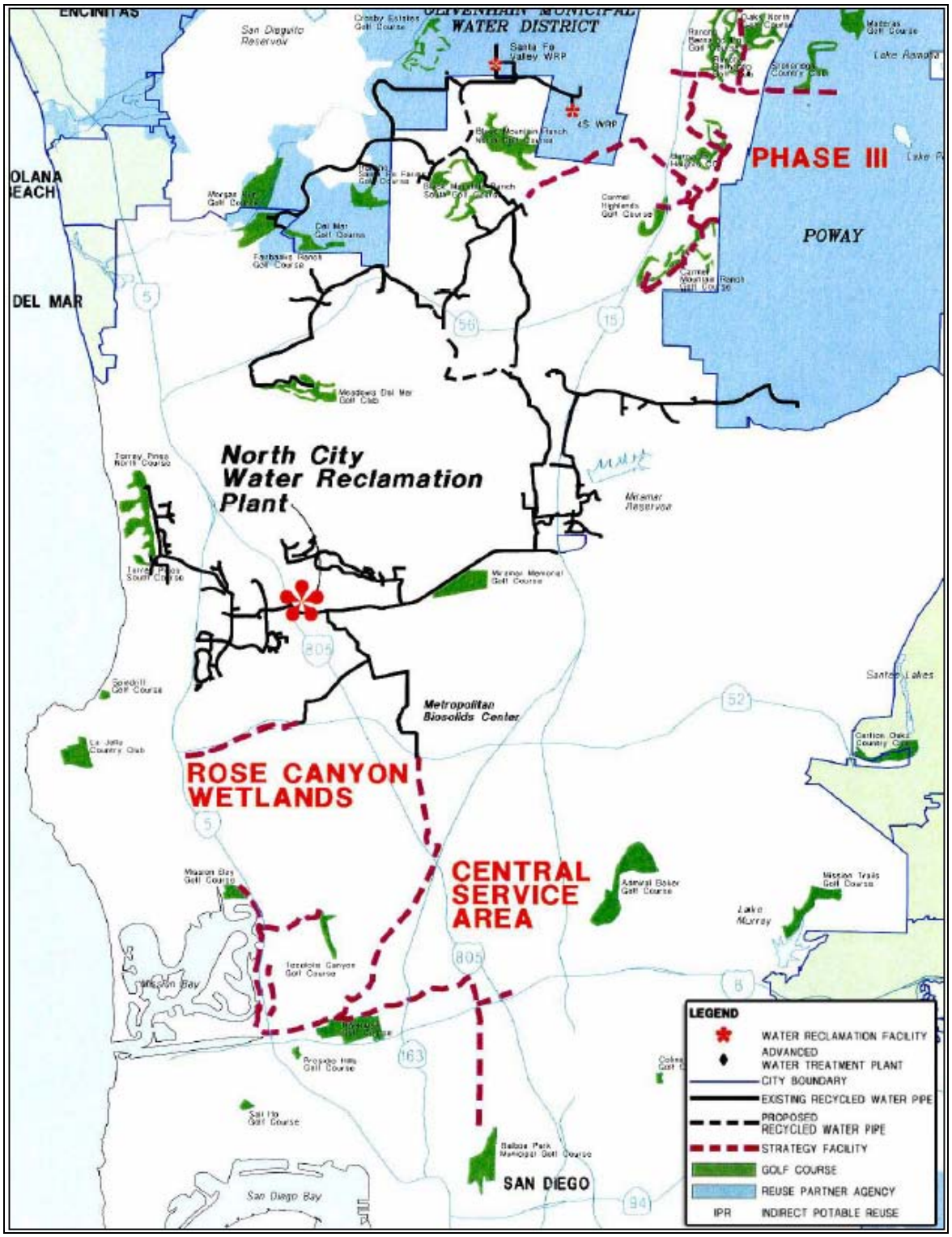
In December 2000, the City prepared the Updated Water Reclamation Master Plan. The Master Plan recommended a three-phase expansion of the Northern Service Area distribution system. Phase I and Phase II included expansion of the system north on Black Mountain Road and then west into Carmel Valley. Phase III included recycled water service to the Rancho Bernardo area. Infrastructure associated with Phases I and II are currently under construction, in design phases, or completed. The City has not authorized funding for the Phase III system, and this phase remains a potential future project for consideration.

Expansion of the existing Northern Service Area recycled water distribution system is centered on four conceptual opportunities:

- The first Northern Service Area opportunity considered was to evaluate the potential for finding new customers adjacent to or within a quarter mile of the existing Phase I and Phase II distribution pipelines. These markets were referred to as "infill" customers.
- The second opportunity considered was to extend the existing system to the northeast to serve the Rancho Bernardo area (Phase III Expansion) and the golf courses located there.
- The third opportunity considered was to extend the existing system south to Friars Road to the Central Service Area where the pipeline would branch west to Mission Bay Park and south to Balboa Park, serving additional customers along the way.
- The fourth opportunity considered was a created wetlands project in Rose Canyon. This opportunity would allow seasonal discharge of recycled water to Rose Canyon Creek through the extension of the existing recycled water system.

These four Northern Service Area non-potable project opportunities are shown in **Figure 5-5**.

FIGURE 5-5
NORTHERN SERVICE AREA NON-POTABLE REUSE OPPORTUNITIES



Northern Service Area – Infill Customers

When the North City recycled water system was originally planned, a market assessment was performed and recycled water customers were assessed based upon three main questions.

- Could their existing water use be met with recycled water?
- How much water did they use?
- What is their proximity to the planned infrastructure?

The City worked closely with customers who decided to connect to the recycled water system. The first step was designing on-site piping upgrades. The designs were submitted for regulatory approval. Upon approval, the customer was disconnected from the potable water system and the pipeline upgrades were constructed. Once the piping upgrades were complete, the customer was connected to the new recycled water system. This process is referred to as retrofitting.

Infill is similar to the retrofit process used to get customers connected to the original recycled water system. The infill opportunity is particularly applicable to the Northern Service Area. The City has made strategic infrastructure investments to get transmission facilities to high use areas in northern San Diego. Infill could occur by connecting smaller non-potable customers along these transmission facility corridors.

The 2010 beneficial reuse goal of 12 MGD can be met via infill in the Northern Service Area. Approximately 300 sites within a quarter mile of the existing and Phase I and II recycled water pipelines were identified in a new market assessment. Approximately 150 of these sites have an estimated average water demand, primarily for irrigation, of 3.6 MGD that will close the gap on the 12 MGD goal. Significant infill customers include Marine Corps Air Station Miramar and Qualcomm, as well as the City's Park and Recreation Department. Potential customers are located in close proximity to existing and planned pipelines. Although off-site infrastructure requirements are minimal, the customer's on-site retrofit requirements could be extensive depending on the size of the irrigated area.

Northern Service Area – Phase III Expansion

The Phase III expansion was originally proposed in the 2000 Master Plan. The expansion of the system would extend the City's recycled water system into Rancho Bernardo. Originally, the Phase III system originated east of Interstate 15 at Sabre Springs. Subsequent technical studies altered the alignment to originate off the Phase II system along Black Mountain Road. The most recent alignment is along the new extension of Carmel Valley Road east of Black Mountain. In the Phase III service area, reservoir locations and piping alignments have also been modified from the 2000 Master Plan.

The Phase III expansion is aimed at serving six San Diego golf courses and two Poway golf courses, and nearby homeowner associations. The expanded system would include approximately 17 miles of pipeline, two separate 2 million gallon reservoirs and a pump station.

In all, 21 customers have been identified with a total average water demand of 2.5 MGD.

Northern Service Area – Interconnection of Central Service Area

Although the Northern and Central service areas are summarized separately in this section, there are opportunities to serve the Central Service Area via the NCWRP. The Central Service Area lies south of the Northern Service Area, bounded by SR-52 on the north and National City on the south. The largest potential recycled water users in this service area are Balboa and Mission Bay Parks. From a strategic planning approach, within the Central Service Area, these markets would be targeted for conversion to recycled water service first due to the large demands associated with these City-owned parks.

To serve the Central Service Area from the Northern Service Area, a 17-mile 24-inch diameter pipeline extension is proposed along Convoy Street from Linda Vista Road to Friars Road, and west on Friars Road to Qualcomm Way. The pipeline would continue south on Texas, tunneling beneath the San Diego River and Interstate 8, to Balboa Park. Additional customers include Riverwalk and Tecolote Golf Courses, the University of San Diego, and Sea World. The estimated average day demand for recycled water in the Central Service Area from the Northern Service Area is 2.35 MGD.

Northern Service Area – Seasonal Storage

To maximize the use of recycled water from the NCWRP with a nonpotable use strategy, seasonal storage is needed to provide a means of storing recycled water in the winter for use during peak summer months. Several seasonal storage opportunities have been considered, including groundwater storage and recovery in the San Dieguito Groundwater Basin, and a number of potential sites for the construction of an excavated earthen basin. Because of the difficulties associated with permitting non-potable recycled water storage in groundwater basins, the San Dieguito Basin was eliminated from consideration. However, several potential earthen basin sites were identified in the Black Mountain area, adjacent to Phase I facilities.

Because the Black Mountain area is currently undergoing development, and the identified properties are not City-owned, it is anticipated that obtaining the rights to these sites would be difficult and most likely expensive. The cost effectiveness of seasonal storage must be weighed against the cost of supplementing the peak recycled water demands with potable water; likewise, the specific volume of water needed for storage is different for each alternative reuse implementation strategy.

Northern Service Area – Wetlands

Wetlands serve as a habitat for diverse and endangered species, provide areas for migratory waterfowl along the Pacific Flyway, improve water quality by filtering pollutants, and help reduce flooding. Recycled water has been used in California to create wetlands. Potential sites for an independent created wetlands project that could be served by the NCWRP include Rose Canyon, Los Penasquitos, San Dieguito River, and De Anza Point (Mission Bay). These sites

were investigated and it was determined that the Los Penasquitos, San Dieguito River and De Anza Point sites and their receiving waters could be negatively impacted by freshwater flows.

Wetlands serve a number of valuable roles in the California environment. Recycled water has been used to create wetlands, however several issues must be considered

Rose Canyon was the most attractive opportunity to study further, based on fewer environmental constraints associated with freshwater flows and proximity to the existing recycled water facilities.

Rose Canyon is an "L" shaped canyon located in the City of San Diego. The canyon originates at the Miramar Marine Corps Air Station and eventually drains to Mission Bay. The area of concentration is a 1.5-mile stretch of the canyon within the Rose Canyon Open Space Park, running east to west between Genesee Avenue and Interstate 5. This section of the canyon is narrow and relatively undeveloped. Rose Creek meanders through the bottom of this portion of the canyon, which contains many natural upland and wetland habitats and is rich in cultural history. Recycled water would enter the canyon from the base of Erlanger Street, off of Governor Drive, east of Genesee Avenue, where an 8-inch existing recycled water pipeline from the NCWRP ends.

Two potential concepts for environmental reuse projects at Rose Canyon were identified based on a review of available photos, maps, and data. One concept would consist of developing year-round wetlands along the bottom of the canyon. The development of these wetlands would impact existing wetland and upland habitat that would make the project difficult to permit and approve. The project would also need to overcome other environmental concerns associated with the alteration of any seasonal drainage to year-round flows, loss of some unique and sensitive wetland and upland habitat, disturbance to cultural resources, and conflicts with recreational and education opportunities.

The second concept would consist of seasonal and/or periodic discharges to Rose Creek. Under this concept, recycled water would be discharged during storms and the wet-season in quantities that do not adversely impact habitats and channel integrity. These wet-season flows avoid potential impacts associated with year-round flows and also may provide some benefits to the

stream ecology. The concept project would use up to 800 AFY of recycled water during the wet-weather months (approximately 1.5 MGD from November to April), when recycled water supplies are generally available.

A factor to consider in evaluating this option, in either its year-round or seasonal form is the likelihood that once a wetlands project is established, the City would be required by permitting agencies to maintain the flow of water to that project perpetually.

The Stone Ridge Golf Course in Poway is a potential regional customer.

Northern Service Area Regional Opportunity – City of Poway

Since 1989, the City of San Diego has had an agreement with the City of Poway to provide recycled water via a connection at Scripps Poway Parkway. Based on that agreement, the City of San Diego would initially provide up to 0.67 MGD (750 AFY) of recycled water to the City of Poway. Upon Poway's request, the City of San Diego would be obligated to expand its pumping capacity to provide an additional 0.40 MGD (450 AFY), for a total of 1.07 MGD (1,200 AFY). To date, Poway has not requested additional supply. Poway typically purchases approximately 0.42 MGD (467 AFY) of recycled water from the City of San Diego to provide irrigation within the South Poway Business Park. To increase supply to high use customers, such as Stone Ridge and Maderas Golf Courses in northern Poway, would require construction of the City's Phase III recycled water system expansion into Rancho Bernardo.

Northern Service Area Regional Opportunity – Olivenhain Municipal Water District and Santa Fe Irrigation District

In December 2004, the City approved an agreement with the Olivenhain Municipal Water District to provide recycled water via a metered connection at San Dieguito Road. This connection was part of the City's Phase I recycled water system expansion to the Black Mountain Ranch development. The agreement allows Olivenhain Municipal Water District to reserve 0.36 MGD (400 AFY) of capacity in the City's Northern Service Area distribution

system for a period of 20 years. Future expansion of Olivenhain's recycled water system or a new service to Santa Fe Irrigation District could increase the demand for recycled water.

Southern Service Area Regional Opportunity – Otay Water District

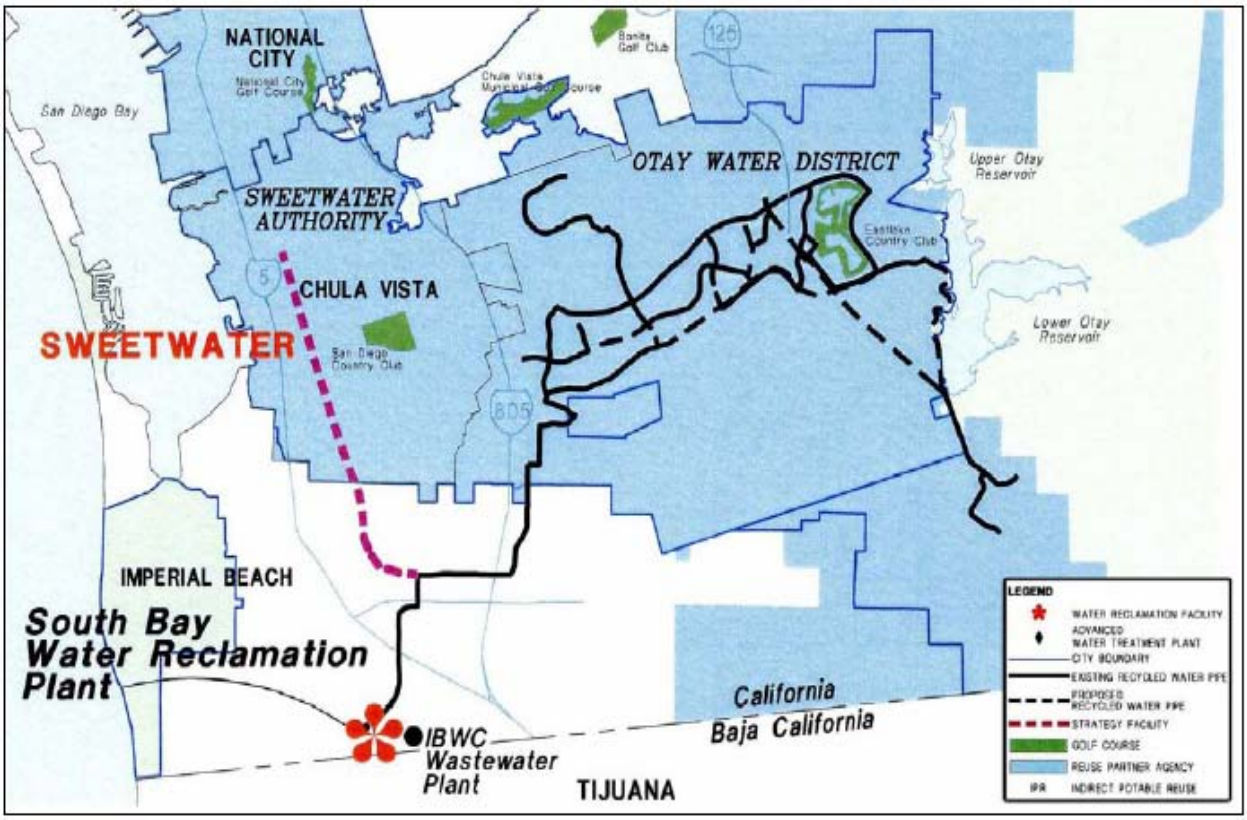
Upon California DHS approval, the 15 MGD SBWRP will provide recycled water for its own on-site uses and for those of the neighboring IBWC Wastewater Treatment Plant.

Otay Water District provides water and wastewater service in south San Diego, including the eastern part of the City of Chula Vista, portions of the City of San Diego and unincorporated areas within San Diego County. Otay does have its own water reclamation treatment plant, the 1.3 MGD Ralph W. Chapman Water Recycling Facility. This facility cannot meet all the demands in the Otay recycled water system. Therefore, in 2003, Otay Water District agreed to purchase up to 6 MGD of recycled water from the City of San Diego's SBWRP by 2007. The City's recycled water will supplement Otay Water District's existing recycled water supply to help meet demands within their service area. Otay Water District will construct portions of their master-planned recycled water system as new subdivision projects are developed, as well as a pipeline connection to the City's southern service area distribution system at Dairy Mart Road, shown as an existing pipeline in **Figure 5-6**. Future expansion of the Otay Water District system may increase the need for City supply beyond the current 6 MGD commitment.

Southern Service Area – Sweetwater Expansion

Expansion of the City's recycled water distribution system in the South Bay area to service customers in the Sweetwater Authority District is also being considered (**Figure 5-6**). Sweetwater Authority provides water service to National City and western portions of Chula Vista. The largest potential customer in this area is a proposed power plant. Typically, power plants are good recycled water customers as they use large quantities of water consistently throughout the year. The result is fewer customers to coordinate with and more capacity in the overall supply system. Sweetwater Authority's average annual demand is estimated to be 5.25 MGD

FIGURE 5-6
SOUTHERN SERVICE AREA NON-POTABLE OPPORTUNITIES



Southern Service Area – Wetlands

Potential sites for a created wetlands project in the Southern Service Area included the Dairy Mart Road Pond Enhancement, Tijuana River Valley locations, and South Bay Salt Flats. The South Bay Salt Flats were eliminated from consideration due to its distance from the SBWRP and because the property is privately owned. The Dairy Mart Road site has been studied by the Water Authority and it was determined that enhancement is not considered necessary or desirable there. Tijuana River Valley sites would likely require the conversion of agricultural lands and freshwater flows from a wetlands project there may impact the Tijuana Estuary. Based on this initial survey, no potential sites were identified as likely locations for a wetlands project in the Southern Service Area.

Southern Service Area – Seasonal Storage

To maximize the use of recycled water from the SBWRP, seasonal storage would provide a means of storing recycled water in the winter for use during peak summer months. Southern Service Area seasonal storage opportunities evaluated include the Tijuana Groundwater Basin, or potential sites for the construction of an earthen basin. Because of the difficulties associated

with permitting non-potable recycled water storage in groundwater basins, the Tijuana Basin was eliminated from consideration. However, numerous potential sites from an earthen basin were identified in the Otay Mesa area, adjacent to Otay Water District's distribution facilities.

Because these areas are currently undergoing development, and the identified properties are not City-owned, it is anticipated that obtaining these sites would be difficult and most likely expensive. The cost effectiveness of seasonal storage must be weighed against the cost of supplementing the peak recycled water demands with potable water. The specific volume of water needed for storage is different for each alternative implementation strategy and the cost effectiveness of seasonal storage was evaluated as a part of the overall strategy proposed.

Southern Service Area Regional Opportunity – Sweetwater Authority

As discussed in the Southern Service Area System expansion section above, the Sweetwater Authority provides water service to National City and western portions of Chula Vista. Currently, Sweetwater Authority does not have reclamation facilities, but has expressed interest in purchasing recycled water from the City of San Diego. However, the Sweetwater Authority has recently completed a recycled water master plan. Recycled water could be used as a source of process and cooling water at a proposed local power plant facility. In addition, the Sweetwater Authority is also investigating the use of recycle water for irrigation and industrial uses. As the Sweetwater Authority recycled water system master plan progresses, further opportunities for increasing regional usage may emerge.

Central Service Area Recycled Water Opportunities

In the 1990's, the Central service area was envisioned to receive recycled water from a new water reclamation plant in Mission Valley. This proposed conventional recycled water treatment plant and related distribution system was never built. Since then, renewed interest in having a Central Service Area system has emerged due to a number of reasons including:

- Large, high profile customers such as Balboa Park, Mission Bay Park, and the Riverwalk Golf Course and
- Treatment technology advances, which has reduced the size and cost of treatment components.

Locating a new recycled water treatment facility in the vicinity of potential Central Service Area customers was evaluated. The City's MWWD provided their projects and future plans, which conceptualized a 15 MGD wastewater treatment plant located in Mission Valley by 2030. This plant could be constructed in conjunction with a reclamation facility to provide recycled water.

A new treatment plant could be sited on a City-owned parcel in Mission Valley on Camino del Rio North. This site is close to a large volume of wastewater via the North Mission Valley Trunk Sewer. The site also appears to allow phased construction of the plant, to save initial cost. To serve the Central Area markets, a Mission Valley reclamation facility would have a capacity of 5 MGD to serve identified irrigation customers in the Central Service Area. Excess recycle water

in the winter months could be returned to the North Mission Valley Trunk Sewer or to the Adjacent San Diego River as part of the live stream discharge / wetlands creation project.

Because the need for a new wastewater treatment facility in this Central Service area is not imminent and the City is concentrating on how to maximize the recycled water it currently produces, this opportunity is not considered viable at this time.

For recycled water customers beyond the City limits, the City works closely with the Water Authority and local water purveyors to provide service. The City supports the Water Authority's efforts to investigate countywide recycled water systems, and the City has also investigated regional opportunities with individual water purveyors. To date, the City has secured agreements with the City of Poway, Olivenhain Municipal Water District and the Otay Water District for the sale of recycled water. These agreements and additional opportunities are discussed below.

Countywide Opportunity – San Diego County Water Authority

In March 2002, the Water Authority published the *Regional Recycled Water System Study* that identified recycled water system strategies that potentially utilized Water Authority and/or local agency facilities. The concepts would provide a balance between recycled water demand and supply in San Diego County. As a result of this analysis, nine project strategies were developed. Two of the proposed strategies involved the City of San Diego.

The Escondido/Padre Dam/Helix/San Diego/Sweetwater Strategy included the utilization of the Water Authority First Aqueduct to send recycled water flows south from Escondido's Hale Avenue Resource Recovery Facility to Helix Water District, serving Padre Dam and the City of San Diego demands by converting the East Mission Gorge Interceptor to recycled water use. Service to the Tijuana Valley/Mexico area with 2.32 MGD of recycled water from either Padre Dam or Escondido was also considered. (It was assumed that Otay Water District would be using all of the available supply from the SBWRP, thus none would be available to Tijuana Valley or Mexico.) Neither of these strategies has been or is expected to be pursued by the Water Authority.

The Water Authority is currently completing a feasibility study that will evaluate locations throughout San Diego County to potentially site satellite membrane bioreactor plants for recycled water production and distribution.

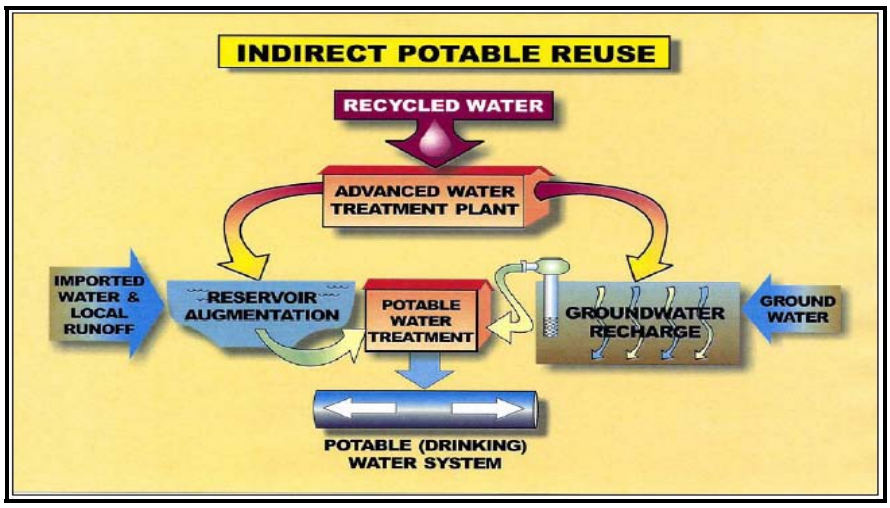
5.3.4 Indirect Potable Reuse Opportunities

Indirect potable reuse is the practice of taking recycled water that meets all regulatory requirements for non-potable use, further treating it with several advanced treatment processes to meet potable water standards, and adding it to an untreated potable water supply. The water body is typically a surface water reservoir or a groundwater aquifer. The term "indirect" refers to the distinction that highly treated recycled water is not plumbed directly to the potable distribution system. During a long residence time, the highly treated recycled water blends with

the source water, which is imported water and local runoff. This process is illustrated in **Figure 5-7**.

Prior to starting an IPR project, extensive permitting and regulatory interaction is required. Regulations are required that the recycled water receive extensive advanced treatment, plus additional natural treatment processes that potable water system, the blended source water is treated at a potable water treatment plant or at a wellhead treatment facility.

Figure 5-7
INDIRECT POTABLE REUSE PROCESS



Reservoir Augmentation Opportunities

Reservoir augmentation is an IPR opportunity that involves adding advanced treated recycled water into a surface water reservoir. Opportunities and constraints of conveying advanced treated water to City-owned, surface water reservoirs have been considered by the City. Regulators require advanced treated water to be stored in the reservoir for a minimum of 12 months in order to blend with the untreated water within the reservoir and undergo a measure of natural treatment. Consideration was also given to the development of wetlands upstream from the surface water reservoir to provide additional natural treatment processes prior to entering the reservoir.

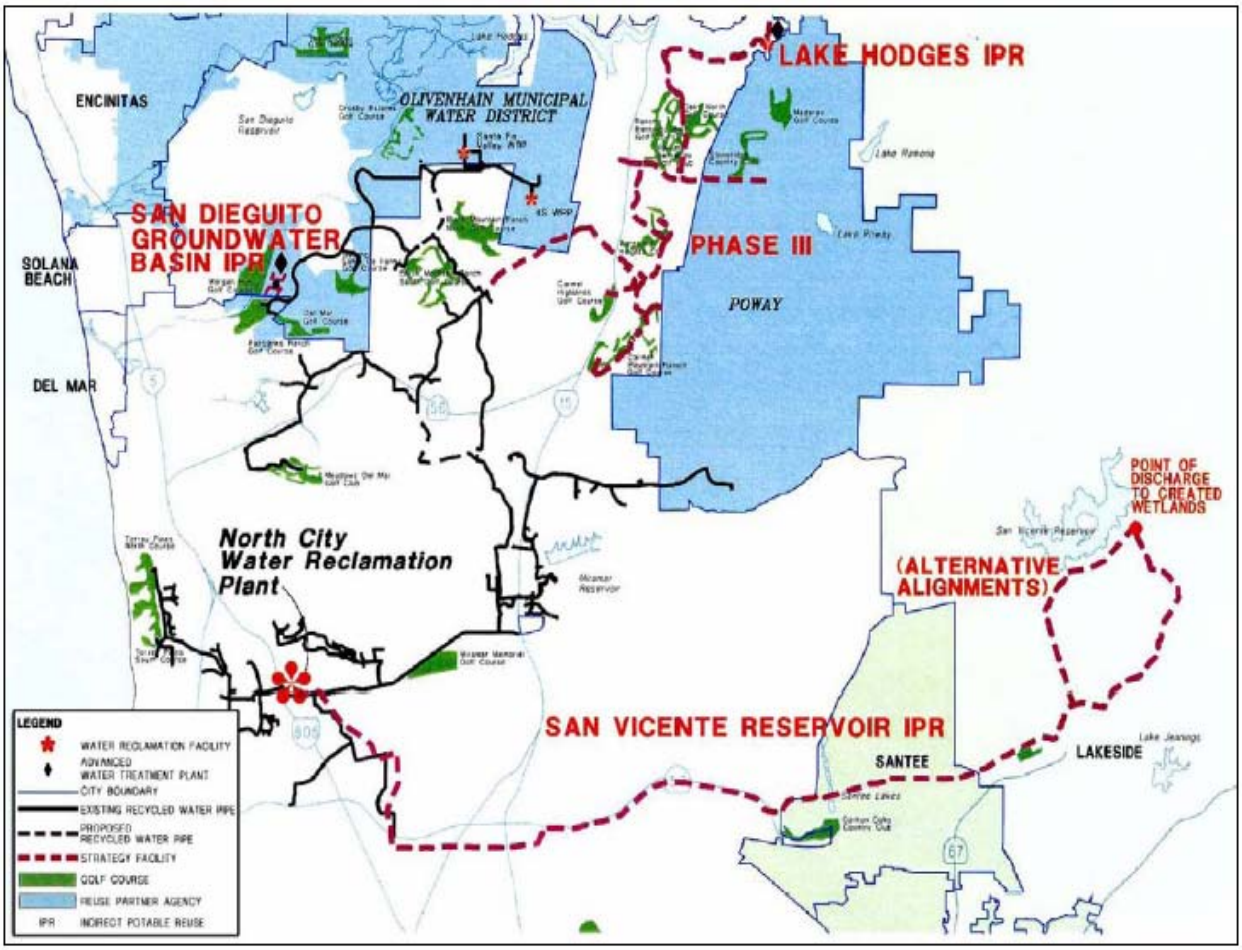
Nine City reservoirs were selected as candidate Reservoir Augmentation concept projects. The Sutherland Reservoir, Lake Hodges, Miramar Reservoir, Lake Murray, San Vicente Reservoir, El Capitan Reservoir, Morena Reservoir, Barrett Reservoir and Lower Otay Lake were considered. Sutherland, Morena and Barrett Reservoirs were determined to be unsuitable due to their distance from the City's existing recycled water facilities. Lake Miramar and Lake Murray were too small for further consideration, even for a small-scale reservoir augmentation project

since retention time requirements would not be met. Of the remaining reservoirs, Lake Hodges and San Vicente were considered further for North City reservoir augmentation opportunities. Lower Otay was considered further for South Bay reservoir augmentation opportunities. In each service area, a full-scale and a small-scale reservoir augmentation project were considered and these opportunities are described below.

Northern Service Area – Reservoir Augmentation Opportunities

Lake Hodges is a possible site for a small-scale reservoir augmentation project. San Vicente was most suitable for a full scale reservoir augmentation project due to its large size and ability to provide appropriate retention times. Drawbacks to the San Vicente include its distance from the recycled water supply source. Each of these proposed projects is shown in **Figure 5-8**, and described on the following pages.

Figure 5-8
NORTHERN SERVICE AREA INDIRECT POTABLE REUSE OPPORTUNITIES



Lake Hodges Reservoir Augmentation Project

A small-scale Lake Hodges reservoir augmentation project would require the implementation of the Phase III expansion of the Northern Service Area recycled water distribution system into Rancho Bernardo (see non-potable opportunity section). At the northernmost end of the distribution system, an advanced water treatment plant would be sited in close proximity to the reservoir and the treated water would be conveyed to Lake Hodges. The treatment facility would be capable of providing 2 MGD of water to supplement local runoff and imported water that is stored in Lake Hodges. This water would subsequently be conveyed to drinking water treatment plants that serve both San Diego North County and North City areas. Upon completion of the Water Authority ESP, using new infrastructure, water from Lake Hodges will also be able to be distributed to areas further south.

The advanced water treatment facility would operate 8 to 10 months out of the year. The limited months of operation is an affect of the seasonal peaking of the Northern Service Area's existing and planned non-potable uses (i.e. a majority of the NCWRP capacity will be needed to serve non-potable uses during summer months for this option). Therefore, the advanced water treatment plant needed for this IPR project would be idle for these months. Brine disposal from the advanced water treatment plant would require new facilities to convey the brine to the City's existing sewer collection system, or north to the City of Escondido treatment facilities.

San Vicente Reservoir Augmentation Project

A large-scale San Vicente reservoir augmentation project would include a 16 MGD advanced water treatment facility. The new advanced water treatment plant would be located adjacent to the NCWRP. A 23-mile pipeline would be needed to convey the water to San Vicente. An optional, created wetland could be constructed near the reservoir to add a natural treatment process prior to the water entering the reservoir. Brine disposal would be accomplished by tying into the NCWRP brine disposal facilities. This large-scale project beneficially maximizes the recycled water available from the NCWRP.

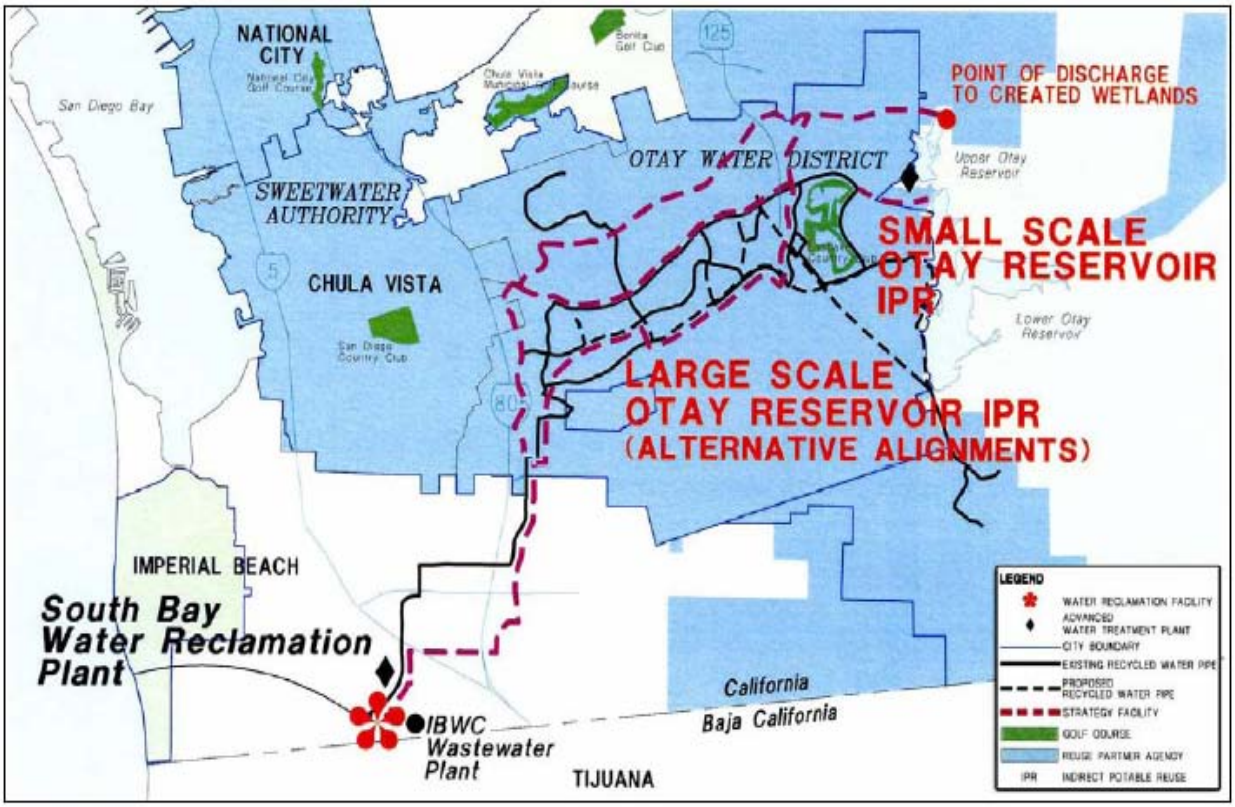
The Water Authority's ESP includes increasing the volume stored in the San Vicente Reservoir. The dam raise, and related transmission facilities, will allow delivering San Vicente water to all City treatment plants and areas served by those plants. Therefore, the San Vicente reservoir augmentation project provides the most service coverage.

Southern Service Area Reservoir Augmentation Opportunities – Otay Lakes

Both the small-scale and large-scale reservoir augmentation projects, shown in **Figure 5-9**, in the Southern Service Area involve the Lower Otay Reservoir. Conceptually, these projects would take recycled water from the City's SBWRP, treat it to an advanced level at an advanced water treatment plant, and then convey the highly treated water to the Lower Otay Reservoir. An optional, created wetland could be constructed near the reservoir to add a natural treatment process prior to the water entering the reservoir.

From Lower Otay, the water would be withdrawn for treatment at the City's Otay Water Treatment Plant and distributed through the City's potable water distribution system to a majority of the South Bay area. Interconnection pipelines between the City's Otay and Alvarado systems also allow water to be delivered north to the Alvarado Service Area.

Figure 5-9
SOUTHERN SERVICE AREA INDIRECT POTABLE REUSE OPPORTUNITIES



The small-scale project would take advantage of the City's capacity rights in the existing recycled water distribution system through the Otay Water District. A 2 MGD advanced water treatment plant would be located near Otay Lakes. Brine flows would be discharged into a trunk sewer belonging to the City of Chula Vista, and eventually treated at the City's PLWTP.

The large-scale 5.5 MGD advanced water treatment plant would be located adjacent to the SBWRP. A 16-mile pipeline would be constructed to convey water to the reservoir. Brine would be discharged into a trunk sewer belonging to the City of Chula Vista, and eventually treated at the City's PLWTP.

The large-scale 5.5 MGD advanced water treatment plant would be located adjacent to the SBWRP. A 16-mile pipeline would be constructed to convey water to the reservoir. Brine would be discharged to the South Bay Outfall. This large-scale project beneficially maximizes the recycled water available from the SBWRP.

Groundwater Recharge Opportunities

Advanced treated water may also be added to groundwater. The advanced treated water is injected directly into the aquifer via wells, or percolates into the aquifer via spreading basins. The advanced treated water blends with the groundwater and undergoes natural treatment processes within the basin. The blended water is eventually extracted, treated and added to the potable water system (drinking water supply). This practice is referred to as groundwater recharge and must meet the minimum retention times and stringent quality criteria. Once extracted, a significant level of additional treatment may be necessary to achieve the required drinking water quality depending on the existing groundwater quality conditions.

The San Pasqual, San Dieguito, Santee/El Monte, Mission Valley, San Diego Formation and Tijuana Groundwater basins were considered. Of these basins, San Dieguito was the only basin to appear to be suitable for considering a groundwater recharge project.

Domestic water use and insufficient retention times made the San Pasqual Basin unfeasible at this time. The Mission Valley basin has benefits, such as simpler institutional issues and an improved ability to get water into and out of the basin. However, the basin is generally narrow and shallow and there are no planned recycled water conveyance facilities from either the Northern or Southern Service Areas to support it. Similarly, the Santee/El Monte basin is currently available on the San Diego Formation making a determination regarding its suitability for an IPR project difficult. Lastly, the Tijuana basin water quality is influenced by sewage and untreated industrial discharges at the international border. Therefore, extracted water from the Tijuana basin is of extremely questionable quality. In addition, the basin has extensive riparian vegetation and extraction of groundwater could have a significant environmental impact on this habitat. These conditions severely limit the ability of the Tijuana basin to be used for an indirect potable groundwater recharge project.

The San Dieguito Basin was selected for further evaluation due to its size, proximity to a larger recycled water source, and its current degraded quality and limited use. The San Dieguito basin groundwater recharge concept, shown in **Figure 5-8**, entails conveying NCWRP recycled water to an advanced water treatment plant located adjacent to the basin. The water produced at the 2.2 MGD advanced water treatment plant, based on draft California DHS requirements, would be blended with 1.6 MGD of potable water and then piped to spreading basins over the San Dieguito groundwater basin. The water would percolate into the ground and mix with groundwater to recharge the basin. After regulatory requirements are met, the water would be extracted, treated, and distributed into the city's potable (drinking) water system at the Del Mar Heights Pipeline. The project would also have the ancillary benefit of significantly improving the water quality of upstream portions of the basin.

Additional considerations of the San Dieguito groundwater recharge concept include the need to blend the advanced treated recycled water with imported water, the need for brine disposal and the number and complexity of agreements that would be required with neighboring and overlying local agencies and municipalities, as well as property owners, in this area. Many high profile golf courses and horse ranches are located in this low-lying valley and continue to access

and use the groundwater through on-site wells. The permitting of a groundwater recharge project in a basin that is designated for potable uses is anticipated to require an amendment to the RWQCB's Basin Plan, a lengthy and difficulty process. Given the difficulty associated with implementation, this opportunity is not considered viable at this time.

5.3.5 Feasibility of Uses

For both the North City and South Bay systems there is a range of reuse opportunities that are feasible from an engineering, scientific, and regulatory perspective. As for the indirect potable reuse strategy, public acceptance will depend on the City's commitment and ability to garner public support through an extensive public involvement program.

The City faces choices in deciding how far to pursue each reuse opportunity. With each opportunity, there are implementation phases that add new units of reuse, usually at progressively higher and higher incremental cost. In deciding how far along to advance each reuse opportunity, the City will need to weigh the cost of each reuse opportunity with the water supply reliability, sustainability and the merits of each type of use.

Table 5-5
RECYCLED WATER USES IN SAN DIEGO
(POTENTIAL AF YEAR)

Type of Use	Treatment Level	2010	2015	2020	2025	2030
Agriculture		0	0	0	0	0
Landscape	Tertiary	9,441	8,025	8,325	8,378	8,378
Wildlife Habitat		0	0	0	0	0
Wetlands	Secondary	0	0	0	0	0
Industrial	Tertiary	2,450	2,450	2,450	2,450	2,450
Groundwater Recharge		0	0	0	0	0
Other - Wholesale	Tertiary	4,338	5,754	6,612	7,078	7,078
TOTAL		**11,263**	**16,229**	**17,387**	**17,906**	**17,906**

Recycled Water Demand

The City has taken a variety of steps to optimize the use of recycled water. However, the 2000 projected demand for recycled water use in year 2005 was significantly more than the actual use.

TABLE 5-6
RECYCLED WATER USES
2000 PROJECTIONS COMPARED WITH 2005 ACTUAL
(AF YEAR)

Type of Use	2000 Projection for 2005	2005 Actual Use
Agriculture	1,500	0
Landscape	8,000	2,134
Wildlife Habitat	0	0
Wetlands	1,000	0
Industrial	0	1,693
Groundwater Recharge	0	0
Other - Wholesale	0	467
TOTAL	**10,500**	**4,294**

In 1997, the San Pasqual Water Reclamation Plant (SPWRP) was transferred from the City of San Diego Water Department to the MWWD. The facility could treat up to 1 MGD of recycled water for the irrigation of local agriculture fields. However, operation of the SPWRP was suspended by the MWWD in 2001.

A Client Site Retrofit Program was also offered as an incentive to potential recycled water customers through FY 2001. This program funded 100 percent of the cost to retrofit customer sites to receive recycled water for irrigation, commercial, and industrial processes. With the sunset of the Client Site Retrofit Program, the City offered a 50 percent discounted rate on recycled water as a financial incentive to customers who voluntarily retrofitted their sites. The City has received minimal response to the deep discount thus far.

Certification of SBWRP was granted by the RWQCB in 2004. The South Bay Distribution System consists of a pipeline in Dairy Mart Road which will eventually connect to the facilities being constructed by the Otay Water District. Targeted for completion in 2007, the system will carry recycled water to the Otay Water District at a rate of 6 MGD.

Although the 2000 projected demand for recycled water use in year 2005 was not achieved, the Water Department is well on its way to meeting the projected Recycled Water usage demand for year 2010. We are currently expanding the NCWRP distribution system as described by the Recycled Water Optimization Plan. Also, infill customers have been identified by a Market Assessment carried out as part of the Water Reuse Study 2005, both of which will significantly increase the total demand from NCWRP.

5.3.6 Actions

Water Reuse Study

On January 13, 2004, the San Diego City Council adopted Resolution R-298781, provided as **Appendix M**, directing the City Manager to conduct a study evaluating all aspects of a viable increased water reuse program. The study would include evaluations of the following opportunities to expand the City's use of recycled water:

- Groundwater storage,
- Expansion of the distribution system,
- Reservoirs for recycled water,
- Live stream discharge,
- Wetlands development,
- Reservoir augmentation and
- Gray water use.

For each of the above opportunities, the study would provide an assessment of public health, public acceptance, cost, reliability, and current science and technology issues.

As part of the planning process the study team, consisting of consultant engineers, scientist, public relations specialist and City Water Department staff, developed an objective, a mission statement and goals for the project:

Objective
To conduct an impartial, balanced, comprehensive and science-based study of all recycled water opportunities so the City of San Diego can meet current and future water needs.

Mission
To pursue opportunities to increase local water supply and reliability, and optimize local water assets, through a comprehensive study of recycled water.

This mission statement is intended to guide the study team to achieve their objective. Coupled with the mission are the three primary goals, which were established by the study team. The goals are aligned with the City Council Resolution R-298781 and are listed below:

Goals

- To develop opportunities for recycled water that are safe, economically viable, environmentally sustainable, protect human health, and reflect public values through a fair and unbiased evaluation of recycled water uses.
- To partner with residents, businesses, agencies and government to help policy makers make informed decisions on how to best use recycled water.

- To provide tools to expand the public's awareness, knowledge and involvement, and present information in a way that is understandable and accessible to all San Diegans.

The overall study goal is to develop viable choices for policy makers seeking to optimize water reuse. The opportunities would be vetted through public involvement sessions, and an Independent Advisory Panel of experts was enlisted to provide insight, critique, and recommendations on study efforts.

In preparing the Water Reuse Study 2005, a series of technical memoranda were written to provide an in-depth review of various topics pertinent to the study. The technical memoranda produced are listed below.

- Master Plan Update (Master Plan 2005)
- Groundwater Opportunities
- Wetland Opportunities
- Graywater Opportunities
- Reservoir Augmentation Opportunities
- Science, Technology, and Regulatory Issues
- Cost Analysis
- Public Outreach and Involvement

This technical memorandum will represent the Master Plan 2005 for the City of San Diego's Recycled Water System. The document will review the available supply of recycled water, an updated market assessment, and recycled water system expansion opportunities in the City of San Diego.

Mandatory Reuse Ordinance

On July 24, 1989, the San Diego City Council approved Ordinance 0-173727 (Mandatory Reuse Ordinance or MRO) provided in **Appendix N**, which specified that "recycled water shall be used within the City where feasible and consistent with the legal requirements, preservation of public health, safety and welfare, and the environment." On December 9, 2002 San Diego City Council passed Resolution R-297487 **(Appendix O)** authorizing City staff to work in conjunction with the Public Utilities Advisory Commission (PUAC) to develop specific criteria to be applied in determining which particular properties would be required to use recycled water for suitable and approved purposes.

In order to develop specific reuse criteria for both new development and "retrofit" situations, City staff met with the PUAC Subcommittee on Water & Wastewater Service Delivery in early 2003. As a result, an initial draft of proposed criteria was developed which balanced the following elements in determining specific properties and facilities that would be required to use recycled water:

1. Type of approved use (e.g. landscape irrigation, sanitary purpose, etc.)

2. Proximity of the property to existing recycled water pipelines

3. Construction cost; and

4. Amount of potable water savings anticipated as a result of conservation to recycled water use.

City staff presented draft criteria to community groups, stakeholders and other interest parties to obtain feedback on their preliminary concerns with regard to their application. The draft criteria threshold for retrofit properties was set at 20 AFY to provide a 4 to 5 year payback period, consistent with most business planning cycles. The proposed criteria were approved by the PUAC on November 17, 2003.

Since the PUAC approval of the criteria, City staff has continued to provide follow-up presentations to targeted stakeholders to listen to their concerns on the impact of the criteria on specific business and operations and to identify potential mitigation measures for these concerns. Based on feedback from the stakeholders and the City's extensive efforts in conducting research, cost analysis and studies to evaluate their concerns, the recycled water use criteria was revised once again. The major aspects to the proposed criteria are listed as follows:

1. Dual plumbing of recycled water in new buildings with height greater than 55 feet or occupancy of 800 or more people will remain as stated in previous criteria as a condition of development. Staff recommended that the criteria also include buildings over 80,000 square feet.

2. Manufacturers with usage levels greater than 5 AFY are no longer mandated to use recycled water, instead manufacturing facilities must submit a recycled water use study to the City detailing the degree of feasibility associated with recycle water use.

3. Previous criteria that all new buildings utilizing 300 tons of cooling or greater be required to use recycled water for such purposes will remain in place.

4. Staff recommends establishment of a 20 AFY usage threshold to mandate retrofits. The threshold was previously approved by the PUAC and was reaffirmed on July 9, 2004.

City staff also performed a customer development analysis to identify an approach that will effectively coordinate with customers subject to the MRO and increase awareness to potential customers that do not meet the mandatory reuse criteria. City staff recommended the following potential initiatives to implement for Fiscal Year 2005.

1. Create an informational program targeted to customers who will be mandated to use recycled water.

2. Implement a prospective nurturing program to boost prospect-to-customer conversion rate.

3. Develop a public awareness program for the area served by the NCWRP that is integrated with the Water Authority's region-wide approach.

On August 4, 2004, the Natural Resources and Culture committee (NR&C) recommended Council action associated with enforcing a provision of the MRO that would require customers using potable water to switch to recycled water. Presentation to the City Council is pending, based on the completion of the Water Reuse Study 2005. The following tables are taken from the July 2004 City Manager's Report No. 04-172, provided in **Appendix P,** which summarizes the proposed criteria for retrofit markets and for new development markets, respectively.

TABLE 5-7
PROPOSED RECYCLED WATER MANDATORY USE IN SAN DIEGO RETROFIT MARKET

Title 22 Uses of 2.2 Disinfected Tertiary Recycled Water	**Retrofit market (Where property line is contiguous to RW line*)**				
	Residential		**Schools, Commercial, Industrial, Governmental**	**Parks and Cemeteries**	**Golf Courses**
	Single Family Dwelling	**Multi-Family/HOA**			
Irrigation	Not Required	**Required if = or >20 AFY usage for irrigation**	**Required if = or > 20AFY usage for irrigation**	**Required**	**Required**
Dual Plumbing – Sanitary Uses	Not allowed per Title 22	Not allowed per Title 22	Not required. Voluntary	Not Required	Not Required
HVAC – Cooling Tower	Not Applicable	Not Required	Not required. Voluntary	Not Applicable	Not Applicable
Manufacturing Process**	Not Applicable	Not Applicable	Not Required. Voluntary	Not Applicable	Not Applicable
Other Uses***	**May be required, on a case-by-case basis.**				

Source: Attachment 2 in Recycled water Mandatory Reuse Ordinance Criteria, City Manager's Report No. 04-172 issued on July 28, 2004

*Proposed Retrofit criteria are in effect when a pipeline capable of serving recycled water is contiguous to the customer's property or will be contiguous within on year.

**For manufacturing that uses potable water as part of manufacturing process.

***Refer to Title 22 Water Recycling Criteria in California (cost recovery of < or = 5 years will be used).

TABLE 5-8
PROPOSED RECYCLED WATER MANDATORY USE IN SAN DIEGO NEW DEVELOPMENT MARKET

Title 22 Uses of 2.2 Disinfected Tertiary Recycled Water	New Development Market (Where property line is contiguous to RW line*)				
	Residential		Schools, Commercial, Industrial, Governmental	Parks and Cemeteries	Golf Courses
	Single Family Dwelling	Multi-Family/HOA			
Irrigation	Not Required	**Required**	**Required**	**Required**	**Required**
Dual Plumbing – Sanitary Uses	Not allowed per Title 22	Not allowed per Title 22	**Required, if recycled water is available or will be available based on City of San Diego current Master Plan and building is 55 ft in height, projected to have at least 800 occupant, or encompasses 80k sq ft**	Not Required	Not Required
HVAC – Cooling Tower	Not Applicable	Not Required	**Required if > or = 300 Tons capacity or 5 AFY recycled water usage.**	Not Applicable	Not Applicable
Manufacturing Process **	Not Applicable	Not Applicable	Recycled water Use Study submitted as a condition of development	Not Applicable	Not Applicable
Other Uses***	**May be required, on a case-by-case basis.**				

Source: Attachment 2 in Recycled water Mandatory Reuse Ordinance Criteria, City Manager's Report No. 04-172 issued on July 28, 2004

* For manufacturing that proposes to use potable water as part of manufacturing process.

** Refer to Title 22 Water Recycling Criteria in California.

***New development projects are required to install recycled water facilities for approved uses within an existing or proposed recycleded water service is in accordance with Subdivision Map Act and City of San Diego Municipal Code.

Proposed criteria will be finalized for approval upon the City Council's decision to move forward with a water reuse development plan.

5.3.7 Financial Incentives

The economics of serving new customers with recycled water began in 2001. A discount of 50 percent of the potable water rate (approximately 50 percent of potable or $350/AF) was offered to potential customers. However, this incentive did not prove to entice a significant number of customers due to the high cost of retrofit construction.

TABLE 5-9
METHODS TO ENCOURAGE RECYCLED WATER USE

Actions	AF of use projected to result from this action				
	2010	**2015**	**2020**	**2025**	**2030**
Financial Incentives	100	50	50	50	50
Mandatory Reuse Ordinance	1000	1000	100	100	100
TOTAL	**1100**	**1050**	**150**	**150**	**150**

The City of San Diego has analyzed the cost of producing recycled water and is planning to reduce the discount for recycled water to fully recover production and distribution costs.

SECTION 6 – WATER QUALITY

The Act requires that the 2005 Plan include information, to the extent practicable, on the quality of existing supply sources and the manner in which water quality affects water supply reliability. This section summarizes water quality issues associated with supplies serving the City of San Diego. Data on CRA and SWP supplies came in part from Metropolitan's draft 2005 Regional Urban Water Management Plan (RUWMP).

6.1 COLORADO RIVER

High salinity levels and perchlorate contamination represent two areas of concern regarding the quality of Colorado River supplies.

Salinity

The salts in the Colorado River System are indigenous and pervasive, mostly resulting from saline sediments in the basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. Agricultural development and water diversions over the past 50 years increase the already high naturally occurring levels of total dissolved solids (TDS).

Water imported via the Colorado River has a TDS averaging around 650 milligrams per liter (mg/l) during normal water years. During the high water flows of 1983-1986, salinity levels in the Colorado River dropped to a historic low of 525 mg/l. However, during the 1987-1990 drought, higher salinity levels returned. During an extreme drought, CRA supplies could exceed 900 mg/l. High levels of TDS in water supplies can damage water delivery systems and home appliances.

To reduce the affects of high TDS levels on water supply reliability, Metropolitan approved a Salinity Management Policy in April 1999. One of the policy goals is to blend Colorado River supplies with lower-salinity water from the SWP to achieve delivered water salinity levels less than 500 mg/l TDS. In addition, to foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum). To lower TDS levels in Colorado River supplies, the Forum develops programs designed to prevent a portion of the abundant salt supply from moving into the river system. The Colorado River Basin Salinity Control Program targets the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs.

Perchlorate

Ammonium perchlorate is used as the main component in solid rocket propellant, and it can also be found in some types of munitions and fireworks. Ammonium perchlorate and other perchlorate salts are readily soluble in water, dissociating into the perchlorate ion, which does not readily interact with the soil matrix or degrade in the environment. The primary human health concern related to perchlorate is its effects on the thyroid. Perchlorate has been detected

at low levels in Metropolitan's CRA water supply. Because of the growing concerns over perchlorate levels in drinking water, in 2002 Metropolitan adopted a Perchlorate Action Plan. Objectives include expanded monitoring and reporting programs and continued tracking of remediation efforts in the Las Vegas Wash. Metropolitan has been conducting monthly monitoring of Colorado River supplies. The perchlorate originates in the Las Vegas Wash, and the most likely source was a chemical manufacturing site located in Henderson, Nevada. The Nevada Department of Environmental Protection manages a comprehensive groundwater remediation program in the Henderson area. As of December 2004, the amount of perchlorate entering the Colorado River system from Henderson has been reduced from approximately 900 pounds per day (lb/day) to less than 150 lb/day.

6.2 STATE WATER PROJECT

The quality of SWP water as a drinking water source is affected by a number of factors, most notably seawater intrusion and agricultural drainage from peat soil islands in the Delta.

SWP water contains relatively high levels of bromide and total organic carbon, two elements that are of particular concern to drinking water agencies. Bromide and total organic carbon combine with chemicals used in the water treatment process to form disinfection by-products that are strictly regulated under the federal Safe Drinking Water Act (SDWA). Wastewater discharges from cities and towns surrounding the Delta also add salts and pathogens to Delta water, and they reduce its suitability for drinking and recycling.

The City of San Diego treats all water to meet stringent state and federal drinking water standards before delivering it to customers. However, source water of poor quality will make it increasingly expensive and difficult to meet such standards. The California Urban Water Agencies (CUWA) retained the assistance of a panel of drinking water quality and treatment experts to evaluate the source water quality necessary to allow agencies treating Delta water to comply with future drinking water regulations under a plausibly conservative regulatory scenario. The expert panel identified target bromide and total organic carbon concentrations of 50 parts per billion (ppb) and 3 parts per million (ppm), respectively. These targets were written into the document adopted by CALFED in 2000.

CALFED will either achieve these targets at Clifton Court Forebay and drinking water intakes in the south and central Delta, or it will achieve an "equivalent level of public health protection using a cost-effective combination of alternative source waters, source control, and treatment technologies." CALFED did not establish a similar target for the salinity of Delta water, a particular concern in Southern California, because of the high salinity levels in Colorado River water, but the 2004 CALFED Drinking Water Quality Program Plan lists two "numeric targets," less than 220 ppm over a 10-year average and less than 440 ppm as a monthly average.

Actions to protect Delta fisheries have exacerbated existing water quality problems by forcing the SWP to shift its diversions from the springtime to the fall, when salinity and bromide levels are higher. Closure of the Delta Cross-Channel gates to protect migrating fish has also degraded SWP water quality by reducing the flow of higher quality Sacramento River water to the SWP pumps at critical times.

Water supplies from the SWP have significantly lower TDS levels than the Colorado River, averaging 250 mg/l in water supplied through the East Branch and 325 mg/l on the West Branch. Because of this lower salinity, Metropolitan blends SWP water with high salinity CRA water to reduce the salinity levels of delivered water. However, both the supply and the TDS levels of SWP water can vary significantly in response to hydrologic conditions in the Sacramento-San Joaquin watersheds.

The TDS levels of SWP water can also vary widely over short periods of time. These variations reflect seasonal and tidal flow patterns, and they pose an additional problem to blending as a management tool to lower the higher TDS from the CRA supply. For example, in the 1977 drought, the salinity of SWP water reaching Metropolitan increased to 430 mg/l, and supplies became limited. During this same event, salinity at the Banks Pumping Plant exceeded 700 mg/l. Under similar circumstances, Metropolitan's 500 mg/l salinity objectives could only be achieved by reducing imported water from the CRA. Thus, it may not be possible to maintain both salinity standards and water supply reliability unless salinity levels of source supplies can be reduced.

The CALFED Bay-Delta Program's EIS/EIR, Technical Appendix, July 2000 Water Quality Program Plan, identified targets that are consistent with TDS objectives in Article 19 of the SWP Water Service Contract: a ten-year average of 220 mg/l and a maximum monthly average of 440 mg/l. These objectives were set in the 1960s when Metropolitan expected to obtain a greater proportion of its total supplies from the SWP. Because of reductions in expected SWP deliveries, Metropolitan's Board believes that this standard is no longer appropriate, so it has adopted a statement of needs from the Bay-Delta. Under the drinking water quality and salinity targets element, the Board states its need "to meet Metropolitan's 500 mg/l salinity-by blending objective in a cost-effective manner while minimizing resource losses and ensuring the viability of recycling and groundwater management programs."

6.3 SURFACE WATER

The City's water quality is influenced by a variety of factors depending on its source. As stated above, water from the Colorado River and from Northern California are vulnerable to a number of contributors to water quality degradation. City of San Diego surface and groundwater are primarily vulnerable to increasing urbanization in the watershed, agriculture, recreational uses, wildlife, and fires.

Source water protection is fundamentally important to all of California. The DHS requires the City of San Diego and other large utilities to complete a Watershed Sanitary Survey every five years to examine possible sources of drinking water contamination. The survey includes suggestions for how to protect water quality at the source. A similar requirement from the EPA calls for utilities to complete a Source Water Assessment (SWA). Information collected in SWAs is used to evaluate changes in potential sources of contamination and to help determine if more protection measures are needed. EPA requires utilities to complete a SWA that uses information collected in the sanitary surveys. The SWA is also used to evaluate the vulnerability

of water sources to contamination and also helps determine whether more protective measures are needed.

The monitoring of key constituents in source waters is critical in helping to identify constituents that should be controlled at the source and to determine the best ways to operate the water system so as to improve the quality of water delivered to the consumer. The effect of urban runoff on receiving water quality is a recently recognized problem. Most of the work up to the present has centered on characterizing urban runoff: measuring concentrations of various constituents, attempting to relate these concentrations to such factors as land use type and rainfall intensity, and studying the effects of these constituents on street surfaces. It appears that considerable quantities of contaminants, heavy metals in particular, may enter the receiving waters through urban runoff. The Federal Water Pollution Control Act Amendments of 1972 stress future "control of treatment of all-point and non-point sources of pollution." Thus, the federal government has concluded that non-point sources, such as urban runoff, are indeed harmful to the aquatic environment and that measures should be taken to control such emissions.

There are four basic approaches to controlling pollution from urban runoff: (1) prevent contaminants from reaching urban land surfaces; (2) improve street cleaning and cleaning of other areas where contaminants may be present; (3) treat runoff prior to discharge to receiving waters; and (4) control land use and development. Which approach or combination of approaches is most effective or economical has not yet been studied extensively. Thus, only the basic characteristics of each approach can be discussed. In addition to these direct approaches, measures to reduce the volume of runoff from urban areas are also available.

The fourth approach is to encourage controls on urbanization in order to reduce the volume of runoff. The usual pattern is that increased urbanization leads to higher runoff coefficients, reflecting the many impervious surfaces associated with development. Roof drains to storm sewers, paved parking lots and streets, installation of storm sewers, filling of natural recharge areas, and increased efficiency in realigned and resurfaced stream channels all are characteristics of urban growth. Development near streams and on steep slopes harms water resources. It is less disruptive to develop the lower portions of a watershed than the headwater areas, both from the standpoint of the length of channel affected and the extent of channel enlargement necessary to convey storm water. Use of porous pavements and less reliance on roof connections to storm drains and more emphasis on local recharge would reduce the peak volume of runoff from storms. An area's mass emissions of urban drainage constituents should be quantified. Urban planning should be more cognizant of land constraints to permit greater natural recharge where possible and feasible, and to discourage intensive development of steep land, particularly in headwater areas.

To address the issues associated with surface water quality, the City of San Diego, the Water Authority, and the County of San Diego have formed a Regional Water Management Group to coordinate development of an Integrated Regional Water Management Plan (IRWMP) for the San Diego region. An important element in the IRWMP is to protect and enhance the region's local surface water quality. As part of this process, projects will be identified and implemented to assist in watershed protection, and thereby, protect the quality of surface water supplies.

In the past, City of San Diego surface water quality has been considered good to excellent. Water quality can vary with imported water inflows and surface water contamination. Source water protection is considered a key element in local water quality. The City of San Diego is working to improve watershed awareness and management. Currently, the most significant water quality issue that affects the public is algae blooms, which can create taste and odor problems.

In San Diego County, DHS has primacy over the implementation of the SDWA. The SDWA regulates source water protection to ensure public health through the multiple barrier approach, an approach that anticipates that the public will participate in source water protection. Member agencies in the Water Authority's service area that have surface water have a good, long-standing, working relationship with DHS.

6.4 GROUNDWATER

Two water quality parameters that can affect reliability of groundwater resources are contamination from Methyl Tertiary Butyl Ether (MTBE) and high salinity levels.

Salinity

Increased TDS in groundwater basins occurs either when basins near the ocean are over drafted, leading to seawater intrusion, or when agricultural and urban return flows add salts to the basins. Much of the water used for agricultural or urban irrigation infiltrates into the aquifer, so where high TDS irrigation water is used or where the water transports salts from overlying soil, the infiltrating water will increase the salinity of the aquifer. Using this resource requires costly demineralization projects.

To protect the quality of these basins, the Regional Board often places restrictions on the salinity levels of water used for basin recharge or for irrigation of lands overlying the aquifers. Where these restrictions are in place, water reuse and aquifer recharge may be restricted, or expensive mitigation measures may be required.

Methyl Tertiary Butyl Ether

Until recently, MTBE was the primary oxygenate in virtually all the gasoline used in California. In January 2004, the Governor's executive order to remove MTBE from gasoline became effective, and now ethanol is the primary oxygenate. MTBE is very soluble in water and has low affinity for soil particles, thus allowing the chemical to move quickly in the groundwater. MTBE is also resistant to chemical and microbial degradation in water, making treatment more difficult than the treatment of other gasoline components.

MTBE presents a significant problem to groundwater basins. Leaking underground storage tanks and poor fuel-handling practices at local gas stations may provide a large source of MTBE. Improved underground storage tank requirements and monitoring, and the phase-out of MTBE as a fuel additive, will probably decrease the likelihood of MTBE groundwater problems in the future.

SECTION 7 – WATER SERVICE RELIABILITY

Projected Normal, Single-Dry & Multiple-Dry Year Supply and Demand

As discussed in **Section 2.4** the City used the Water Authority's projected demands for years 2010 through 2030. The Water Authority selected the Institute for Water Resources – Municipal and Industrial Needs (MAIN) computer model to forecast M&I water use for the San Diego region. The MAIN model uses demographic and economic data to project sector-level water demands (i.e. residential and non-residential demands). This econometric model has over a quarter of a century of practical application and is used by many cities and water agencies throughout the United States. The Water Authority's version of the MAIN model is known as CWA-MAIN.

Approximately every three years the City projects water demands within its service area for planning purposes. A computer model is used (IWR-Municipal and Industrial Needs) to determine water use by water use sectors: Commercial, Industrial, Residential and Public uses. Using past water use data from the City and past demographic data provided by San Diego Association of Government's the model correlates the data to determine sector water demands. Using this correlated data and future demographic data (SANDAG) water demands are projected. The model takes into account water conservation, weather and water rate changes.

The City recently updated its projected water demands (*Update of Long-Term Water Demand Forecast, September 2005*), and compared them to the water demands provided by the Water Authority (letter dated September 12, 2005). After a review it was found that they were similar enough for the City to use for its plan. It was noted that the Water Authority used the same consultant, SANDAG data and a similar model that the City had used to prepare their water demands and variations in the demands were minimal. The only exception was the demands for Cal American which the City has an obligation to meet, and were not included in the Water Authority's projections since Cal American is not a member of the Water Authority. For this report demands for Cal American in Coronado and Imperial Beach were added to the Water Authority's projected demands (the Water Authority accounted for the City's demands in Cal American service area). Therefore, to provide consistency between the retail and wholesale agencies, and ensure that adequate supplies were being planned for the City's existing and future water users, the Water Authority's projected demands (including the City's obligations) were used throughout this report.

7.1 PROJECTED NORMAL YEAR WATER SUPPLY AND DEMAND

Table 7-1 shows supply and demand totals for the normal year assessment in five year increments for a twenty-five year period. In addition the table shows the percentage increase as compared to 2005 demands.

TABLE 7-1
PROJECTED SUPPLY AND DEMAND COMPARISON
(AF YEAR)

	2010	2015	2020	2025	2030
Local Surface Water	29,000	29,000	29,000	29,000	29,000
Recycled Water	8,525	12,200	15,200	15,200	15,200
Imported Water (Water Authority)	201,901	205,178	212,260	222,238	231,725
Supply totals (from **Table 2-2**)	**239,426**	**246,378**	**256,460**	**266,438**	**275,925**
Demand totals (from **Table 2-9**)	**239,426**	**246,378**	**256,460**	**266,438**	**275,925**
% of year 2005	105%	108%	113%	117%	121%

7.2 PROJECTED SINGLE-DRY-YEAR WATER SUPPLY AND DEMAND

The table below shows supply and demand totals for the dry-year assessment in five year increments for a twenty-five year period. In addition the table shows the percentage increase as compared to normal demands.

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

	2010	2015	2020	2025	2030
Local Surface Water	4,500	4,500	4,500	4,500	4,500
Recycled Water	8,525	12,200	15,200	15,200	15,200
Imported Water (Water Authority)	243,161	246,924	254,712	265,389	275,540
Supply totals	**256,186**	**263,624**	**274,412**	**285,089**	**295,240**
Demand totals	**256,186**	**263,624**	**274,412**	**285,089**	**295,240**
% of projected normal*	7.0%	7.0%	7.0%	7.0%	7.0%

* The 7% (approximate) increase was taken from the Water Authority's projections.

7.3 PROJECTED MULTIPLE-DRY-YEAR WATER SUPPLY AND DEMAND

The following tables show supply and demand totals for the multi dry-year assessment in one year increments for a twenty-five year period. In addition the table shows the percentage increase as compared to normal demands.

TABLE 7-3
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2010
(AF YEAR)

	2006	2007	2008	2009	2010
Local Surface Water	7,500	8,100	5,900	4,500	4,900
Recycled Water*	5,001	5,882	6,763	7,644	8,525
Imported Water (Water Authority)	233,439	234,519	238,400	241,480	242,761
Supply totals	**245,940**	**248,501**	**251,063**	**253,624**	**256,186**
Demand totals	**245,940**	**248,501**	**251,063**	**253,624**	**256,186**
% of projected normal**	7.0%	7.0%	7.0%	7.0%	7.0%

* Interpolated from 2005 to 2010.
**The 7% (approximate) increase was taken from the Water Authority's projections.

TABLE 7-4
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2015
(AF YEAR)

	2011	2012	2013	2014	2015
Local Surface Water	7,500	8,100	5,900	4,500	4,900
Recycled Water*	9,260	9,995	10,730	11,465	12,200
Imported Water (Water Authority)	240,913	241,066	244,019	246,171	246,524
Supply totals	**257,673**	**259,161**	**260,649**	**262,136**	**263,624**
Demand totals	**257,673**	**259,161**	**260,649**	**262,136**	**263,624**
% of projected normal**	7.0%	7.0%	7.0%	7.0%	7.0%

* Interpolated from 2010 to 2015.
**The 7% (approximate) increase was taken from the Water Authority's projections.

TABLE 7-5
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2020
(AF YEAR)

	2016	2017	2018	2019	2020
Local Surface Water	7,500	8,100	5,900	4,500	4,900
Recycled Water*	12,800	13,400	14,000	14,600	15,200
Imported Water (Water Authority)	245,482	246,439	250,197	253,155	254,312
Supply totals	**265,782**	**267,939**	**270,097**	**272,255**	**274,412**
Demand totals	**265,782**	**267,939**	**270,097**	**272,255**	**274,412**
% of projected normal**	7.0%	7.0%	7.0%	7.0%	7.0%

* Interpolated from 2015 to 2020.
**The 7% (approximate) increase was taken from the Water Authority's projections

TABLE 7-6
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2025
(AF YEAR)

	2021	2022	2023	2024	2025
Local Surface Water	7,500	8,100	5,900	4,500	4,900
Recycled Water	15,200	15,200	15,200	15,200	15,200
Imported Water (Water Authority)	253,847	255,383	259,718	263,253	264,989
Supply totals	**276,547**	**278,683**	**280,818**	**282,953**	**285,089**
Demand totals	**276,547**	**278,683**	**280,818**	**282,953**	**285,089**
% of projected normal*	7.0%	7.0%	7.0%	7.0%	7.0%

*The 7% (approximate) increase was taken from the Water Authority's projections.

TABLE 7-7
PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2030
(AF YEAR)

	2026	2027	2028	2029	2030
Local Surface Water	7,500	8,100	5,900	4,500	4,900
Recycled Water	15,200	15,200	15,200	15,200	15,200
Imported Water (Water Authority)	264,419	265,849	270,079	273,510	275,140
Supply totals	**287,119**	**289,149**	**291,179**	**293,210**	**295,240**
Demand totals	**287,119**	**289,149**	**291,179**	**293,210**	**295,240**
% of projected normal*	7.0%	7.0%	7.0%	7.0%	7.0%

*The 7% (approximate) increase was taken from the Water Authority's projections.

2005 CITY OF SAN DIEGO
URBAN WATER MANAGEMENT PLAN

APPENDICES

APPENDIX A

Established: AB 797, Klehs, 1983
Amended: AB 2661, Klehs, 1990
AB 11X, Filante, 1991
AB 1869, Speier, 1991
AB 892, Frazee, 1993
SB 1017, McCorquodale, 1994
AB 2853, Cortese, 1994
AB 1845, Cortese, 1995
SB 1011, Polanco, 1995
AB 2552, Bates, 2000
SB 553, Kelley, 2000
SB 610, Costa, 2001
AB 901, Daucher, 2001
SB 672, Machado, 2001
SB 1348, Brulte, 2002
SB 1384, Costa, 2002
SB 1518, Torlakson, 2002
AB 105, Wiggins, 2004
SB 318, Alpert, 2004

CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

CHAPTER 1. GENERAL DECLARATION AND POLICY

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

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

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

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

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in

its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

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

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

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

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

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

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

CHAPTER 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS
Article 1. General Provisions

10620.

(a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d)

(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

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

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

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

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

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

Article 2. Contents of Plans

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

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

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

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

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(1) An average water year.
(2) A single dry water year.
(3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

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

(e)

(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.
(B) Multifamily.
(C) Commercial.
(D) Industrial.
(E) Institutional and governmental.
(F) Landscape.
(G) Sales to other agencies.
(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.

(K) Conservation pricing.

(L) Water conservation coordinator.

(M) Water waste prohibition.

(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

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

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

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

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

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

(j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council

in accordance with the ‘‘Memorandum of Understanding Regarding Urban Water Conservation in California,’’ dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).

(k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier’s plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including,

but not limited to, a regional power outage, an earthquake, or other disaster.

(d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(h) A draft water shortage contingency resolution or ordinance.

(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

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

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5 Water Service Reliability

10635.

(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

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

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Articl 3. Adoption and Implementation of Plans

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644.

(a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall

also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

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

CHAPTER 4. MISCELLANEOUS PROVISIONS

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws

or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657.

(a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.

APPENDIX B

NOTICE OF PUBLIC HEARING FOR THE DRAFT 2005 URBAN WATER MANAGEMENT PLAN FOR THE CITY OF SAN DIEGO

NOTICE IS HEREBY GIVEN to all interested in the above subject matter that a draft 2005 Urban Water Management Plan (2005 Plan) is being developed by the City of San Diego (City). A PUBLIC HEARING will be held at the City of San Diego's Public Utilities Advisory Commission Meeting, on Monday, October 17, 2005, from 8:30am to 10:30am at the Metro Operations Center II located at 9192 Topaz Way in San Diego, California 92123. The 2005 Plan is listed as Item 9 on the meeting agenda.

The draft 2005 Plan identifies water resources plans to be developed over the next 25 years which will, along with conservation efforts, ensure long-term water supply reliability for the City.

The San Diego City Council will consider the draft 2005 Plan for adoption at one of its regularly scheduled meetings. The California Urban Water Management Planning Act, included in the state Water Code, requires urban water suppliers to prepare urban water management plans and update them every five years. The City is required to update and adopt a plan for submittal to the California Department of Water Resources by December 31, 2005.

The public is invited to submit written comments concerning the draft 2005 Plan to the City. The public may also request that an electronic copy of the draft 2005 Plan be e-mailed for review by e-mailing their request to: cdrobbins@sandiego.gov. Comments on the draft 2005 Plan must be received by October 27, 2005, and can also be e-mailed to the City at cdrobbins@sandiego.gov, or by writing to: Urban Water Management Plan, City of San Diego Water Department MS-912, 600 B Street Suite 1210, San Diego, CA 92101.

If you have any questions regarding the draft 2005 Plan, please contact Chris Robbins, Supervising Management Analyst at (619) 533-4203 or cdrobbins@sandiego.gov.

Pub. Oct. 11 -k115169

APPENDIX C

RESOLUTION NUMBER R-301859

DATE OF FINAL PASSAGE SEPTEMBER 19, 2006

A RESOLUTION ADOPTING THE 2005 CITY OF SAN DIEGO URBAN WATER MANAGEMENT PLAN.

WHEREAS, the Urban Water Management Planning Act [Act] requires urban water suppliers to prepare and adopt an Urban Water Management Plan [Plan], and to review and update the Plan at least once every five years; and

WHEREAS, in accordance with the Act, the City of San Diego has prepared an updated 2005 Plan, has encouraged the active involvement of the community in the preparation of the Plan, and has made the Plan available for public inspection; and

WHEREAS, in accordance with the Act, prior to the public hearing on adoption of the Plan, notice of the time and place of the hearing was published in accordance with Government Code section 6066, and was provided to the County of San Diego; NOW, THEREFORE,

BE IT RESOLVED, by the Council of the City of San Diego, that the 2005 City of San Diego Urban Water Management Plan is hereby adopted, a copy of which is on file with the City Clerk as Document No. RR-301859.

BE IT FURTHER RESOLVED, that the California Environmental Quality Act does not apply to this activity pursuant to California Water Code section 10652.

APPROVED: MICHAEL J. AGUIRRE, City Attorney

By _____
Lori W. Girard
Deputy City Attorney

LWG:cla
07/11/2006
Or.Dept:Water
R-2007-25
Aud. Cert.: N/A

I hereby certify that the foregoing Resolution was passed by the Council of the City of San Diego, at this meeting of September 11, 2006.

ELIZABETH S. MALAND
City Clerk

By_____
Deputy City Clerk

Approved: _____ _____
(date) JERRY SANDERS, Mayor

Vetoed: _____ _____
(date) JERRY SANDERS, Mayor

APPENDIX D

DWR 2005 URBAN WATER MANAGEMENT PLANNING ACT CHECKLIST

Section In Plan	Page # In Plan	Section of Law	Items to Address
1.2	1-2	10620 (d) (1)	Participated in area, regional, watershed, or basin wide plan.
1.2	1-2	10620 (d) (2)	Coordinate the preparation of the plan with other appropriate agencies, including direct and indirect suppliers, wastewater, groundwater, and planning agencies. (refer to Section 10633)
2, 5	2-1 to 2-21, 5-1 to 5-41	10620 (f)	Describe how water management tools and options maximize resources and minimize the need to import water.
1.2	1-2 Pending	10621 (a)	Date plan was updated and adopted plan was received.
	Pending	10621 (b)	Notify any city or county within service area of UWMP of plan review and revision.
NA			Consult and obtain comments from cities and counties within service area.
1.4.1	1-5	10631 (a)	Provide current and projected population in 5-year increments to 20 years.
1.4.5	1-7 to 1-10		Describe climate characteristics that affect water management.
1.4.2, 1.4.3, 1.4.4	1-5 to 1-7		Describe other demographic factors affecting water management.
2.1	2-3	10631 (b)	Identify and quantify the existing and planned sources of water available in 5 year increments to 20 years.
2.4	2-7		Provide current water supply quantities.
2.1	2-3		Provide planned water supply quantities.
		10631 (b) (1-4)	If Groundwater identified as existing or planned source, attach management plan.

City of San Diego does not supply Groundwater. (Refer to Section 2.7)			Provide description of basin, if basin is adjudicated, attach order or decree.
			Quantify amount of legal pumping right.
			DWR identified, or projected to be, in overdraft. Provide Plan to eliminate overdraft.
			Provide analysis of location, amount and sufficiency, in the last five years.
			Provide analysis of location and amount projected in five year increments to 20 years.
2.2	2-5	10631 (c)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.
2.2,2.3	2-4, 2-6	10631 (d)	Describe the short term and long term exchange or transfer opportunities.
2.4	2-7	10631 (e) (1)	Quantify current water and past water use in 5-year increments to 20-years.
2.4	2-7	10631 (e) (2)	Identify projected water uses among water use-sectors in 5-year increments to 20 years.
2.4.1	2-8, 2-9		Identify and quantify sales to other agencies.
2.4.1	2-9		Identify and quantify additional water uses.
Appendix G		10631 (f)	2005 Urban Water Management Plan “Review of DMMs for Completeness” form.
NA		10631 (g)	Non-implemented/not scheduled DMMs/
2.6	2-18	10631 (h)	Planned water supply projects or programs.
2.7	2-19	10631 (i)	Opportunities for development of desalinated water.
3	3-1, Appendix G	10631 (j)	Agency is a member of CUWCC

Appendix G			2003-04 annual updates attached to plan and considered complete by CUWCC website.
2.8	2-20, 2-21	10631 (k)	Agency receives, or projects receiving wholesale water.
2.8	2-20		Provide written demand projections to wholesaler in 5-year increments to 20-years.
2.8	2-20		Wholesaler provides written water availability projections in 5-year increments to 20-years.
2.8	2-20		Reliability of wholesale supply provided in writing by wholesale agency.
4.1	4-1 to 4-2	10632 (a)	Provide stages of action to be undertaken by the urban water supplier in response to water supply shortages, to a 50 percent reduction.
4.1	4-2		Provide outline of specific water supply conditions which are applicable for each stage.
4.2	4-2 to 4-3	10632 (b)	Estimate the minimum water supply available during each of the next three water years based on the driest 3-year historic sequence for the agency's water supply.
4.3	4-7 to 4-12	10632 (c)	Provide catastrophic supply interruption plan.
4.4.1	4-13	10632 (d)	List the mandatory prohibitions against specific water use practices during water shortages.
4.4.2	4-14	10632 (e)	List the consumption reduction methods the water supplier will use to reduce water use in the most restrictive stages, to a 50 percent reduction.
4.4.3	4-14	10632 (f)	List the excessive use penalties or charges for excessive use.
4.5	4-14 to 4-16	10632 (g)	Describe how actions and conditions impact revenues and expenditures.
4.5	4-16		Describe measures to overcome the revenue and expenditure impacts.
Appendix K, Refer also to Water Authority's 2005 Plan		10632 (h)	Attach a copy of the draft water shortage contingency resolution or ordinance.

4.6	4-17	10632 (i)	Provide mechanisms for determining actual reductions.
5.1	5-1 to 5-2	10633	Describe the coordination of the recycling plan preparation information to the extent available.
5.2	5-2 to 5-10	10633 (a)	Describe the wastewater collection and treatment systems in the supplier's service area, including the quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
5.2	5-4	10633 (b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
5.2.1	5-6	10633 (c)	Describe the current type, place, and use of recycled water.
5.3	5-11 to 5-34	10633 (d)	Describe and quantify potential uses of recycled water and determine the technical and economic feasibility of serving potential uses.
5.3.5	5-33	10633 (e)	Provide the projected uses of recycled water within the supplier's service area in 5-year increments to 20-years.
5.3.5	5-34		Describe the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
5.3.6, 5.3.7	5-35 to 5-41	10633 (f)	Describe actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.
5.3.6, 5.3.7	5-35 to 5-41		Provide plan for optimizing the use of recycled water in the supplier's service area.
6.1	6-1 to 6-6	10634	Discuss water quality impacts by source upon water management strategies and supply reliability.
7.1	7-2	10635 (a)	Compare the projected normal water supply to projected normal water use in 5-year increments to 20-years.
7.2	7-2		Compare the projected single-dry year water supply to projected single-dry year water use in 5-year increments to 20-years.
7.3	7-3		Project a multiple-dry year period occurring between 2006-2010 and compare projected supply and demand during those years.

7.3	7-3		Project a multiple-dry year period occurring between 2011-2015 and compare projected supply and demand during those years.
7.3	7-3		Project a multiple-dry year period occurring between 2016-2020 and compare projected supply and demand during those years.
7.3	7-4		Project a multiple-dry year period occurring between 2021-2025 and compare projected supply and demand during those years.
Pending		10635 (b)	Provide water service reliability section of UWMP to cities and counties within which it provides water supplies within 60 days of UWMP submission to DWR.
Pending		10642	Attach a copy of adoption resolution.
1.2	1-2		Encourage involvement of social, cultural, and economic community groups.
Pending			Plan available for public inspection.
Appendix B			Provide Proof of Public Hearing.
Appendix B			Provide meeting notice to local residents.
Executive Summary	i-ii	10643	Reviewed implementation plan and schedule of 2000
Pending		10644	Provide 2005 UWMP to DWR, and cities and counties within 30 days of adoption.
Pending		10645	Does UWMP or correspondence accompanying it show where it is available for public review.

APPENDIX E

CITY OF SAN DIEGO, CALIFORNIA

COUNCIL POLICY

CURRENT

SUBJECT: EMERGENCY STORAGE OF WATER
POLICY NO.: 400-04
EFFECTIVE DATE: December 27, 1973

BACKGROUND:

The City of San Diego's major supply of water is through the aqueducts, canals, and pumping plants of the Metropolitan Water District and the San Diego County Water Authority. While such facilities have an excellent record of service, it is entirely possible for service to be interrupted by floods, earthquakes, or sabotage. Prior to 1963 the Water Utilities Department operated under an unofficial policy of providing approximately one year's storage as an emergency supply. An evaluation of the hazard and possible interruptions balanced against the costs of emergency storage caused us to reevaluate this requirement.

PURPOSE:

To provide a minimum quantity of stored, untreated water to provide for emergencies such as aqueduct failure or aqueduct pump stations outage.

POLICY:

The Water Utilities Department shall have six-tenths of the annual requirement of the City of San Diego and its contractees as active, available storage at the following reservoirs: Lake Skinner, San Vicente, El Capitan, Lower Otay, Murray, and Miramar. The active, available storage shall include any water in the San Vicente Reservoir stored to the account of the San Diego County Water Authority or the Metropolitan Water District of Southern California but shall not include any water stored at El Capitan Reservoir by the Helix Irrigation District. The active, available storage shall also include 60% of the active, available storage in the Metropolitan Water District Lake Skinner Reservoir. Active, available storage shall be that portion of the water which is above the lowest usable outlet of each reservoir.

HISTORY:

Adopted by Resolution R-176832 08/13/1963
Amended by Resolution R-200189 07/02/1970
Amended by Resolution R-209553 12/27/1973

APPENDIX F

Article 7: Plumbing and Mechanical Regulations

Division 4: Other Water-Conserving Plumbing Standards

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0401 Purpose of Water-Conserving Plumbing Standards

The purpose of this division is to reduce sewer flows and decrease the use of imported, potable water in the City by establishing water-conserving plumbing standards for plumbing fixtures.
(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0402 When the Water-Conserving Plumbing Standards Apply

The provisions of this division apply to the installation of water-conserving plumbing fixtures in any structure served by the City of San Diego Water Utilities Department.
(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0403 Definitions for this Division

The following definitions are applicable to this division.

Bathroom Alteration mean any alteration of or addition to a bathroom in any structure for which Section 129.0402 would require a plumbing permit for replacement of a toilet.

Bathroom Alteration Retrofit Certificate means a certificate that certifies that any responsible person who has completed a bathroom alteration has replaced any existing plumbing fixture in the altered bathroom with a water-conserving plumbing fixture.

Change of Ownership means a transfer, sale, or exchange of the fee interest in any real property.

Existing Plumbing Fixture means the following:

(1) any toilet manufactured to use more than 3.5 gallons of water per flush;

(2) any urinal manufactured to use more than one gallon of water per flush;

(3) any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute;

(4) any faucet that emits more than 2.2 gallons of water per minute; or

(5) any residential reverse osmosis system that does not have a shutoff valve.

Existing Structure means either of the following:

(1) any structure served by the City of San Diego Water Utilities Department and equipped with toilets manufactured to use more than 3.5 gallons of water per flush, or urinals manufactured to use more than 1 gallon of water per flush; or

(2) any structure served by the City of San Diego Water Utilities Department and equipped with showerheads that have a flow capacity of more than 2.5 gallons of water per minute, faucets that emit more than 2.2 gallons of water per minute, or residential reverse osmosis systems that do not have a shutoff valves.

Retrofit means to replace any existing plumbing fixture in an exiting structure with a water-conserving plumbing fixture.

Transfer of Responsibility to Retrofit Certificate means a certificate filed by a transferor of any existing structure before a change of ownership that certifies that the transferor and the transferee mutually agree that responsibility for compliance with Section 147.0301 is assumed by the transferee of the existing structure.

Ultra-Low Flush Toilet Rebate Program means a City-sponsored water conservation program that offers a financial incentive to water customers who replace a toilet that is manufactured to use more than 1.6 gallons of water per flush with a toilet manufactured to use no more than 1.6 gallons of water per flush.

Water Conservation Certificate means a certificate filed by a transferor or transferee of any structure or existing structure before a change of ownership that certifies any structure or existing structure is equipped or retrofitted only with water-conserving plumbing fixtures or toilets manufactured to use no more than 3.5 gallons of water per flush.

Water-Conserving Plumbing Fixture means:

(1) any toilet manufactured to use no more than 1.6 gallons of water per flush, that meets performance standards established by American

Society of Mechanical Engineers Standards A112.19.2-1990 and A112.19.6-1990;

(2) any urinal manufactured to use no more than 1 gallon of water per flush, that meets performance standards established by American Society of Mechanical Engineers Standards A112.19.2-1990 and A112.19.6-1990;

(3) any showerhead manufactured to have a flow capacity of no more than 2.5 gallons of water per minute;

(4) any faucet that emits no more than 2.2 gallons of water per minute; or

(5) any residential reverse osmosis system that has a shutoff valve.

(Amended 9-24-2002 by O-19105 N.S.)

§147.0404 Regulations to Retrofit upon Change of Ownership

(a) Before a change of ownership, the transferor of any existing structure shall replace any existing plumbing fixture with a water-conserving plumbing fixture.

(b) Before a change of ownership, the transferor and the transferee of any existing structure may agree to transfer responsibility for compliance with this division to the transferee in accordance with Section 147.0408. If the transferee assumes responsibility for retrofitting, the transferee shall complete the retrofit within at least 90 calendar days of the change of ownership.

(c) The transferor and the transferee of any existing structure may agree to have compliance with this division included as a condition of escrow, have the responsibility for retrofitting assumed by the transferee, and have the retrofit paid for from the proceeds of the sale of the existing structure.

(1) If the transferor and the transferee agree to have compliance with this division included as a condition of escrow, the escrow agent shall retain a sufficient sum of money, agreed upon by the transferor and the transferee, to be retained from the proceeds of the sale to complete the retrofit.

(2) The transferee shall complete the retrofit within at least 90 calendar days of the close of escrow.

(3) After the transferee has completed the retrofit, the transferee shall submit proof of completion of the retrofit to the escrow agent. The escrow agent may release the retained funds from the proceeds of the sale upon receiving reasonable, satisfactory proof of completion of the retrofit from the transferee.

(4) The Building Official shall establish administrative regulations for the procedures to be followed by the transferor, the transferee, and the escrow agent for complying with Section 147.0404(c).

(d) The transferor of any existing structure shall not be required to retrofit when a change of ownership occurs as a result of the following:

(1) A court order, including an order by a probate court in the administration of an estate;

(2) A foreclosure or voluntary or involuntary bankruptcy;

(3) The exercise of eminent domain;

(4) The administration of a deceased person's estate, guardianship, conservatorship, or trust;

(5) One title co-holder of real property transferring, selling, or exchanging with one or more other title co- holders;

(6) A transfer, without consideration, from one family member to another family member; or

(7) A decree of dissolution of marriage, a decree of legal separation, or from a property settlement agreement incidental to such a decree.

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0405 Retrofit upon Bathroom Alteration

Upon bathroom alteration, the responsible person shall replace any existing plumbing fixture in the bathroom being altered with a water-conserving plumbing fixture.
(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0406 Retrofit Exemptions

The Building Official may grant an exemption to the provisions of this division to any person if the Building Official determines that any of the following conditions exists:

(a) A water-conserving plumbing fixture would be installed in an existing structure that has been identified by a local, state, or federal government entity as an historical site, and an historically accurate water-conserving plumbing fixture is not available;

(b) Installation of a water-conserving plumbing fixture would require modifications to plumbing system components located beneath a finished wall or surface; or

(c) The unique configuration of a building drainage system or portions of a public sewer, or both, require a greater quantity of water to flush the system in a manner consistent with public health.

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0407 When a Plumbing Permit Is Required for Water-conserving Plumbing Fixture Installation

Any person who installs a water-conserving plumbing fixture pursuant to Section 147.0404 in any single dwelling unit, or in any multiple dwelling unit with 8 or fewer units, shall not be required to obtain a plumbing permit pursuant to Section 129.0402, unless the installation requires an alteration or replacement of drainage, waste, vent, or supply-plumbing pipes.

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0408 Self-verification

(a) Before a change of ownership, the transferor and the transferee of any structure or any existing structure shall complete the following procedures:

(1) The transferor shall sign a Water Conservation Certificate certifying that the transferor has complied with the requirements of this division or is exempt from retrofitting pursuant to Section 147.0406.

(2) After signing the Water Conservation Certificate, the transferor shall forward the Water Conservation Certificate to the transferee for review and signature.

(3) The transferee shall sign the Water Conservation Certificate, thereby acknowledging awareness and understanding of the requirements of this division.

(4) After the transferee has signed the Water Conservation Certificate, the transferor shall file the Water Conservation Certificate with the Building Official.

(5) If the structure or existing structure goes through escrow, the transferor also shall file a copy of the Water Conservation Certificate with the escrow agent before the close of escrow.

(b) In the event the transferor and transferee of an existing structure agree that the transferee shall have responsibility for the retrofit upon change of ownership pursuant to Section 147.0404(b), before the change of ownership, the transferor and the transferee shall complete the following procedures:

(1) The transferor and the transferee shall sign a Transfer of Responsibility to Retrofit Certificate certifying that the transferee has assumed responsibility for the retrofit.

(2) After the transferor and the transferee have signed the Transfer of Responsibility to Retrofit Certificate, the transferor shall file the Transfer of Responsibility to Retrofit Certificate with the Building Official.

(3) If the existing structure goes through escrow, the transferor also shall file a copy of the Transfer of Responsibility to Retrofit Certificate with the escrow agent before the close of escrow.

(4) Upon completing the retrofit, the transferee shall sign a Water Conservation Certificate certifying that the transferee has complied with the requirements of this division.

(5) Within at least 30 calendar days of the completion of the retrofit, the transferee shall file the signed Water Conservation Certificate with the Building Official.

(c) If the transferor and the transferee have agreed to have compliance with this division included as a condition of escrow, have the responsibility for retrofitting assumed by the transferee, and have the retrofit paid for from the

proceeds of the sale of the existing structure pursuant to Section 147.0404(c), the transferor and the transferee shall complete the following procedures:

(1) The transferor and the transferee shall sign a Transfer of Responsibility to Retrofit Certificate certifying that the transferee has assumed responsibility for the retrofit.

(2) After the transferor and the transferee have signed the Transfer of Responsibility to Retrofit Certificate, and before the close of escrow, the transferor shall file the Transfer of Responsibility to Retrofit Certificate with the Building Official and a copy thereof with the escrow agent.

(3) Upon completing the retrofit, the transferee shall sign a Water Conservation Certificate certifying that the transferee has complied with the requirements of this division.

(4) Within at least 30 calendar days of the completion of the retrofit, the transferee, or the escrow agent on the transferee's behalf, shall file the signed Water Conservation Certificate with the Building Official.

(d) The transferor of any structure that is in compliance with the requirements of this division shall not be required to file a Water Conservation Certificate with the Building Official before a change of ownership pursuant to Section 147.0408 if a Water Conservation Certificate has been filed with the Building Official by a previous owner of the structure.

(e) Upon completing the retrofit of a bathroom pursuant to Section 147.0405, the responsible person shall complete the following procedures:

(1) The responsible person shall sign a Bathroom Alteration Retrofit Certificate certifying that the responsible person has complied with the requirements of Section 145.0405.

(2) Within at least 30 calendar days following completion of any bathroom alteration, the responsible person shall file the signed Bathroom Alteration Retrofit Certificate with the Building Official.

(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

§147.0409 Agents of a Transferor

Nothing in this division is intended to create any duty upon the agent of a transferor or a transferee of any structure or any existing structure, unless otherwise mutually agreed to in writing.
(Added 12-9-1997 by O-18451 N.S.; effective 1-1-2000.)

APPENDIX G

Water Supply & Reuse

Reporting Unit: **City of San Diego**

Year: **2003**

Report Not Filed

Accounts & Water Use

Reporting Unit Name:	Submitted to	Year:
City of San Diego	CUWCC **12/01/2004**	**2003**

A. Service Area Population Information:

1. Total service area population 1258716

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	214174	0	0	0
2. Multi-Family	28829	0	0	0
3. Commercial	20448	0	0	0
4. Industrial	679	0	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	6333	0	0	0
7. Recycled Water	294	0	0	0
8. Other	0	0	0	0
9. Unaccounted	NA	0	NA	0
Total	270757	0	0	0
	Metered		**Unmetered**	

Reported as of 10/

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Based on your signed MOU date, 09/23/1991, your Agency STRATEGY DUE DATE is:	09/22/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1992
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1992

B. Water Survey Data

Survey Counts:	**Single Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	213601	29843
2. Number of surveys completed:	865	60
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)		Other
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		database

b. Describe how your agency tracks this information.

Oracle database. Totals for SF and MF are combined but can be broken out by classification for each type.

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	260732	325098
2. Actual Expenditures	167823	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 10/

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   City of San Diego SDMC 147.04

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? yes

3. Estimated percent of single-family households with low-flow showerheads: 83%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? yes

5. Estimated percent of multi-family households with low-flow showerheads: 80%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

   a. On March 26, 1991, City Council approved Ordinance 17626, which requires installation of ULFT's in all new construction effective May 1, 1991. b. The City supported this legislation that was effective January 1, 1994. c. All 150,000 pre-1981 single-family households retrofitted in FY 91-93. Multi-family and Mobile Home retrofit program implemented in FY 93. In 1991, in association with CWA, showerheads were distributed to public facilities including the Navy and several universities.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 03/01/1991

   b. Describe your targeting/ marketing strategy.

   Many of the initial water conservation programs implemented by the City focused on reducing residential interior water usage. Residential customers were targeted because they account for 57 percent of annual water consumption in the City. In 1991-92 the majority of single-family households, multi-family units, and mobile homes in the City received retrofit kits. The City also promotes the installation of ultra-low flush toilets for permanent water savings, as well as water-efficient landscape and irrigation design to new homeowners. Residential Interior Plumbing Retrofit Program The Residential Interior Plumbing Retrofit Program (Residential Retrofit Program) retrofitted 147,000 pre-1981 single-family households within the City with water saving retrofit kits (low-flow showerheads, toilet tank displacement devices, and leak detection tablets). Using the deliver and canvass method, kit distribution was completed in three phases, from Spring of 1991 through the Fall of 1992. The Residential Retrofit Program's estimated water savings is 1.9 million gallons of water per day or 2,173 acre-feet per year. The City's cost per acre-foot saved to implement this program was $75. City staff continue to issue retrofit equipment upon request to single-family households who did not participate in the program. Multi-Family Interior Plumbing Retrofit

Program The Multi-Family Interior Plumbing Retrofit Program (Multi-Family Retrofit Program) offered similar retrofit kits to the City's multi-family residential customers between July-November 1992. When the Program Office closed its doors, more than 100,000 pre-1981 multi-family residential units had been issued water saving retrofit kits using the depot style of distribution. The Multi-Family Retrofit Program's estimated water savings is 1.6 million gallons of water per day or 1,792 acre-feet* per year. The City's cost per acre-foot saved to implement this program was $25. City staff continue to issue retrofit equipment to multi-family complexes that did not participate in the program when operational, but are now seeking the associated water savings. Mobile Home Showerhead Retrofit The Mobile Home Showerhead Retrofit Program utilized a direct installation approach when it distributed water-saving retrofit kits to approximately 1,250 mobile homes city-wide in June 1992. Along with the retrofit kits, field crews installed energy efficient compact fluorescent lightbulbs, courtesy of the San Diego Gas and Electric Company (SDG&E). The Mobile Home Showerhead Retrofit Program's estimated water savings is 19,649 gallons of water per day or 22 acre-feet* per year. The City's cost per acre-foot saved to implement this program was $25. If requested, City staff will provide low-flow showerheads to mobile homes that have not participated in the program. School Showerhead Program The School Showerhead Program was implemented during the 1993-94 school year, targeting children from Kindergarten through 6th Grade. The goal of this program was to increase children's awareness and understanding of residential water use through a simple self audit conducted in their home with the assistance of their parents. Using a cartoon map that acted as a guide through all water using appliances and fixtures found in a typical home, students and parents were given information on appropriate water conservation measures. The program taught school children to identify potential water conservation measures, and distributed low-flow showerheads and toilet displacement devices where needed. Participating students were given incentives including a colorful wristwatch, refrigerator magnets, pencils, and coupons from corporate sponsors such as El Pollo Loco and KidSoft. This program was implemented in conjunction with the MWD. The School Showerhead Program's estimated water savings is 48,500 gallons per day or 54 acre-feet* per year. The City's cost per acre-foot saved to implement this program is $29.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	227	32
3. Number of toilet-displacement devices distributed:	956	249
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	35971	15013
6. Does your agency track the distribution and cost of low-flow devices?		yes
a. If YES, in what format are low-flow devices tracked?		Database

b. If yes, describe your tracking and distribution system :

The city-wide implementation of water conservation programs designed to promote permanent water savings began in 1991. As each new program began, data was collected and tracked on five separate, stand-alone personal computers (PC's). Each PC constituted a distinct system containing unique program data. After two years of collecting and

entering program data, Water Conservation Program staff recognized the need to centralize and consolidate all information into an integrated and relational database linking all program and participant data. The Consolidated Water Conservation Database (CWCD) project began in 1993. The project team consisted of Water Conservation Program staff, and technical staff from the SDDPC. Project objectives included: (1) centralizing all water conservation program information and simplifying program participation validation; (2) identifying program effectiveness and water savings on both detail and program summary levels; (3) developing a means to identify target groups of customers for future current program participation; and, (4) maintaining the most current/accurate customer information. SDDPC developed a software application in a Windows environment to administer and report on the CWCD. The Windows application is used for program data maintenance, editing, participation validation, and program evaluation. The system runs on a Local Area Network (LAN) allowing staff members to access the CWCD from their personal computer. The CWCD has proven to be a positive business improvement for the Water Conservation Program through the consolidation of program and customer information. Improved practices include: validation of program participation, standardization of program data, integration of customer consumption information, actual water savings since program participation, automation of program participation requests, and an increase in staff efficiency and productivity.

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	134780	157355
2. Actual Expenditures	147192	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Showerheads and faucet aerators continue to be distributed through community events, the ULFT incentive programs, and during field surveys.

Reported as of 10/

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	220178
b. Determine other system verifiable uses (AF)	4106
c. Determine total supply into the system (AF)	224424
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	1.00
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	yes
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Leak detection program is housed within Emergency Services Section.

B. Survey Data

1. Total number of miles of distribution system line.	3138
2. Number of miles of distribution system line surveyed.	0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	1832842	1833472
2. Actual Expenditures	1847651	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

B.2 Statistics not compiled by operations staff.

Reported as of 10/

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use?	yes
2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use?	no
a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?	
b. Describe the program:	
All new accounts require meters.	
3. Number of previously unmetered accounts fitted with meters during report year.	0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	
b. Describe the feasibility study:	
Staffing unavailable for this. See below. Unknown number of mixed use meters.	
2. Number of CII accounts with mixed-use meters.	0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.	58

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

E. Comments

Number of mixed use meters is unknown. Mixed use commercial meters are retrofitted to dedicated irrigation meters when reclaimed water is provided. City Council Resolution R-296437 restricts staffing levels through FY2007, which hampers the Water Conservation Section's ability to perform and/or implement the switch of mixed use meters to dedicated potable water irrigation meters.

Reported as of 10/

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	7605
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	115
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	856
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	1226
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	06/01/1992

b. Description of marketing / targeting strategy:

Bill messages, direct mailers, phone solicitation.

2. Number of Surveys Offered.	67
3. Number of Surveys Completed.	42
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Customers are eligible for annual follow-up surveys and on-going customer support.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	yes
2. Number of CII mixed-use accounts with landscape budgets.	94
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	no

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants			

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Bill messages are used to advertise our programs.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	528328	555021
2. Actual Expenditures	319516	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 10/

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   SDG&E at times offers $75 rebates.

2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate? 125
4. Number of rebates awarded. 3924

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	233120	205934
2. Actual Expenditures	85148	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Budget for HEWs is for both Commercial and Residential.

Reported as of 10/

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Public Education Central to the overall water conservation goal is an enhanced public education program. Public education promotes new plans as well as the existing foundation of conservation programs. The public can't cooperate without being informed, but they also must be convinced. The campaign is structured to reach schoolchildren as well as adults. Elementary students design the aforementioned posters promoting water conservation. Top entries receive prizes as well as extensive public recognition. Water Conservation staff members actively participate in community fairs, providing informational brochures on the various programs and promoting both simple and highly technical conservation measures. Additional components of this program include: updating and maintaining the Department*s and Water Conservation web-site, providing more and better quality brochures and fact sheets that have a centralized theme for water conservation, advertising, working with local television and radio news stations, and coordinating with the CWA, MWD and other local agencies on regional water conservation efforts. In FY2003, the Section's focused on placing articles in community newsletters, participation in television news, and developing "month-to-month" water conservation tips, that can be given to all media formats.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	1
b. Public Service Announcement	yes	8
c. Bill Inserts / Newsletters / Brochures	yes	260000
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	5
f. Special Events, Media Events	yes	26
g. Speaker's Bureau	yes	4
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	320307	320307
2. Actual Expenditures	379010	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	46	10211	36
Grades 4th-6th	yes	284	17032	48
Grades 7th-8th	yes	0	0	0
High School	yes	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 09/09/1990

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

This BMP is provided region-wide by the San Diego County Water Authority (SDCWA). The data is provided by the SDCWA and is approximate. The City also promotes an Annual Water Conservation Poster Contest.

Reported as of 10/

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	189	7	23
b. Number of New Surveys Completed	50	20	6
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	7	2	1
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	3	2	1

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	yes	yes	yes
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	yes	yes

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	50000	417	37575

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	no
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	.79
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	2.26

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	113778	122002
2. Actual Expenditures	233226	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

- Consumption ranking
- Potential savings
- CII Sector or subsector
- CII ULFT Study subsector targeting

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

The City particpates in the SDCWA's voucher program. SDCWA's response will answer this question in detail, however the City also has SDMC 147.04, the City's "Plumbing Retrofit Upon Change of Ownership"(Retrofit Upon Resale Ordinance). Potential savings appears to be the most effective. Numerous referrals received from our CII survey program.

2. How does your agency advertise this program? Check all that apply.

- Bill insert
- Bill message
- Newsletter
- Telephone
- Web page
- Newspapers
- Trade publications
- Other print media
- Trade shows and events

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

SDCWA could answer this question more effectively. Bill inserts, brochures, community events and trade shows.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes

3. What is the total number of customer accounts participating in the program during the last year ? — 136

CII Subsector	Number of Toilets Replaced			
4.	**Standard Gravity Tank**	**Air Assisted**	**Valve Floor Mount**	**Valve Wall Mount**
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	0	0	0	0

d. Health	0	0	0	0
e. Industrial	0	0	0	0
f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design.

Rebate or voucher
Retrofit on resale

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up.

Telephone
Site Visit

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	4
b. Inadequate payback	5
c. Inadequate ULFT performance	3
d. Lack of funding	5
e. American's with Disabilities Act	2
f. Permitting	2

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Many businesses will not change out toilets unless the payback period is less than 1 year.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

See previouse year's response.

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0

d. Administration & Overhead	41399.69	49952.5
e. Outside Services	0	0
f. Total	41399.69	49952.5

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	92220
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	41399.69
e. Total	133619.69

D. Comments

Section C.2 This total represents the amount of funds available in our CII Voucher Incentive Program which besides ULFT's includes; CTCC's, Urinals, and HEW's. The contributing wholesale agencies are MWD and the SDCWA.

Reported as of 10/

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Increasing Block
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

2. Commercial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

3. Industrial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

4. Institutional / Government

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

5. Irrigation

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

6. Other

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

There is no separate budget for this BMP.

D. Comments

Annual report still under review by City Auditor. Audited amounts not available at the time of the BMP submittal.

Reported as of 10/

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	yes
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	100%
b. Coordinator's Name	Luis Generoso
c. Coordinator's Title	Recycling Program Manager
d. Coordinator's Experience and Number of Years	12.5 in Water Conservation
e. Date Coordinator's position was created (mm/dd/yyyy)	06/01/1991
6. Number of conservation staff, including Conservation Coordinator.	22

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	1128995	1426671
2. Actual Expenditures	1287657	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Expenditures include salary and fringe.

Reported as of 10/

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

See SDMC in previous year's submittal.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

San Diego.	Per SDMC.

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no

2. Describe measures that prohibit water uses listed above:

Water Waste Investigations Water Conservation Program staff respond to water waste complaints generated by citizens throughout the Department*s service area. Staff contact the property owner or manager and work to resolve all kinds of water waste concerns and their associated hazards. Water waste complaints can range drastically, yet a typical example would be a broken sprinkler head which is wasting 10 to 15 gallons per minute and flooding adjacent properties

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	no
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	no
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	no
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to	

ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	no
4. Does your agency include water softener checks in home water audit programs?	no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	205867	225382
2. Actual Expenditures	63248	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 10/

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2003**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	9365	6064
Total	**9365**	**6064**

6. Describe your agency's ULFT program for single-family residences.

The ULFT Toilet Voucher Program promotes the incentive-based upgrade of existing fixtures to water-efficient models. Customers receive vouchers that reduce the cost of water efficient toilets that replace existing ones using at least 3.5 gallons per flush. The voucher program is estimated to provide over 8 million gallons of water savings each day.

7. Describe your agency's ULFT program for multi-family residences.

As previous.

8. Is a toilet retrofit on resale ordinance in effect for your service area? yes

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

San Diego	No citations.

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	636401	691521
2. Actual Expenditures	405379	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

ULFT programs for Residential and Commercial are combined budgetarily.

Reported as of 10/

Water Supply & Reuse

Reporting Unit: **City of San Diego**

Year: **2004**

Report Not Filed

Accounts & Water Use

Reporting Unit Name:	Submitted to	Year:
City of San Diego	CUWCC **12/01/2004**	**2004**

A. Service Area Population Information:

1. Total service area population 1294032

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	216958	0	0	0
2. Multi-Family	29936	0	0	0
3. Commercial	20406	0	0	0
4. Industrial	554	0	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	6364	0	0	0
7. Recycled Water	318	0	0	0
8. Other	8538	0	0	0
9. Unaccounted	NA	0	NA	0
Total	283074	0	0	0
	Metered		**Unmetered**	

Reported as of 10/

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Based on your signed MOU date, 09/23/1991, your Agency STRATEGY DUE DATE is:	09/22/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1992
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1992

B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	213619	29847
2. Number of surveys completed:	1217	32
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	yes	yes
7. Review or develop customer irrigation schedule	yes	yes
8. Measure landscaped area (Recommended but not required for surveys)	yes	yes
9. Measure total irrigable area (Recommended but not required for surveys)	yes	yes
10. Which measurement method is typically used (Recommended but not required for surveys)		Other
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	yes	yes
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	yes
a. If yes, in what form are surveys tracked?		database

b. Describe how your agency tracks this information.

Oracle database. Totals for SF and MF are combined but can be broken out by classification for each type.

C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	325098	325098
2. Actual Expenditures	207743	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 10/

BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

   a. If YES, list local jurisdictions in your service area and code or ordinance in each:

   City of San Diego SDMC 147.04

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? yes
3. Estimated percent of single-family households with low-flow showerheads: 85%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? yes
5. Estimated percent of multi-family households with low-flow showerheads: 82%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

   a. On March 26, 1991, City Council approved Ordinance 17626, which requires installation of ULFT's in all new construction effective May 1, 1991. b. The City supported this legislation that was effective January 1, 1994. c. All 150,000 pre-1981 single-family households retrofitted in FY 91-93. Multi-family and Mobile Home retrofit program implemented in FY 93. In 1991, in association with CWA, showerheads were distributed to public facilities including the Navy and several universities.

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

   a. If YES, when did your agency begin implementing this strategy? 03/01/1991

   b. Describe your targeting/ marketing strategy.

   Many of the initial water conservation programs implemented by the City focused on reducing residential interior water usage. Residential customers were targeted because they account for 57 percent of annual water consumption in the City. In 1991-92 the majority of single-family households, multi-family units, and mobile homes in the City received retrofit kits. The City also promotes the installation of ultra-low flush toilets for permanent water savings, as well as water-efficient landscape and irrigation design to new homeowners. Residential Interior Plumbing Retrofit Program The Residential Interior Plumbing Retrofit Program (Residential Retrofit Program) retrofitted 147,000 pre-1981 single-family households within the City with water saving retrofit kits (low-flow showerheads, toilet tank displacement devices, and leak detection tablets). Using the deliver and canvass method, kit distribution was completed in three phases, from Spring of 1991 through the Fall of 1992. The Residential Retrofit Program's estimated water savings is 1.9 million gallons of water per day or 2,173 acre-feet per year. The City's cost per acre-foot saved to implement this program was $75. City staff continue to issue retrofit equipment upon request to single-family households who did not participate in the program. Multi-Family Interior Plumbing Retrofit

Program The Multi-Family Interior Plumbing Retrofit Program (Multi-Family Retrofit Program) offered similar retrofit kits to the City's multi-family residential customers between July-November 1992. When the Program Office closed its doors, more than 100,000 pre-1981 multi-family residential units had been issued water saving retrofit kits using the depot style of distribution. The Multi-Family Retrofit Program's estimated water savings is 1.6 million gallons of water per day or 1,792 acre-feet* per year. The City's cost per acre-foot saved to implement this program was $25. City staff continue to issue retrofit equipment to multi-family complexes that did not participate in the program when operational, but are now seeking the associated water savings. Mobile Home Showerhead Retrofit The Mobile Home Showerhead Retrofit Program utilized a direct installation approach when it distributed water-saving retrofit kits to approximately 1,250 mobile homes city-wide in June 1992. Along with the retrofit kits, field crews installed energy efficient compact fluorescent lightbulbs, courtesy of the San Diego Gas and Electric Company (SDG&E). The Mobile Home Showerhead Retrofit Program's estimated water savings is 19,649 gallons of water per day or 22 acre-feet* per year. The City's cost per acre-foot saved to implement this program was $25. If requested, City staff will provide low-flow showerheads to mobile homes that have not participated in the program. School Showerhead Program The School Showerhead Program was implemented during the 1993-94 school year, targeting children from Kindergarten through 6th Grade. The goal of this program was to increase children's awareness and understanding of residential water use through a simple self audit conducted in their home with the assistance of their parents. Using a cartoon map that acted as a guide through all water using appliances and fixtures found in a typical home, students and parents were given information on appropriate water conservation measures. The program taught school children to identify potential water conservation measures, and distributed low-flow showerheads and toilet displacement devices where needed. Participating students were given incentives including a colorful wristwatch, refrigerator magnets, pencils, and coupons from corporate sponsors such as El Pollo Loco and KidSoft. This program was implemented in conjunction with the MWD. The School Showerhead Program's estimated water savings is 48,500 gallons per day or 54 acre-feet* per year. The City's cost per acre-foot saved to implement this program is $29.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	351	35
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	3672	97

6. Does your agency track the distribution and cost of low-flow devices? yes

a. If YES, in what format are low-flow devices tracked? Database

b. If yes, describe your tracking and distribution system :

The city-wide implementation of water conservation programs designed to promote permanent water savings began in 1991. As each new program began, data was collected and tracked on five separate, stand-alone personal computers (PC's). Each PC constituted a distinct system containing unique program data. After two years of collecting and

entering program data, Water Conservation Program staff recognized the need to centralize and consolidate all information into an integrated and relational database linking all program and participant data. The Consolidated Water Conservation Database (CWCD) project began in 1993. The project team consisted of Water Conservation Program staff, and technical staff from the SDDPC. Project objectives included: (1) centralizing all water conservation program information and simplifying program participation validation; (2) identifying program effectiveness and water savings on both detail and program summary levels; (3) developing a means to identify target groups of customers for future current program participation; and, (4) maintaining the most current/accurate customer information. SDDPC developed a software application in a Windows environment to administer and report on the CWCD. The Windows application is used for program data maintenance, editing, participation validation, and program evaluation. The system runs on a Local Area Network (LAN) allowing staff members to access the CWCD from their personal computer. The CWCD has proven to be a positive business improvement for the Water Conservation Program through the consolidation of program and customer information. Improved practices include: validation of program participation, standardization of program data, integration of customer consumption information, actual water savings since program participation, automation of program participation requests, and an increase in staff efficiency and productivity.

C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	147192	147192
2. Actual Expenditures	128260	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 10/

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year?	yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	220178
b. Determine other system verifiable uses (AF)	4106
c. Determine total supply into the system (AF)	224424
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	1.00
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production?	yes
4. Did your agency complete a full-scale audit during this report year?	no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit?	yes
6. Does your agency operate a system leak detection program?	yes

a. If yes, describe the leak detection program:

Leak detection program is housed within Emergency Services Section.

B. Survey Data

1. Total number of miles of distribution system line.	3138
2. Number of miles of distribution system line surveyed.	0

C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	1833472	1835742
2. Actual Expenditures	1850117	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

B.2 Statistics not compiled by operations staff.

Reported as of 10/

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Does your agency require meters for all new connections and bill by volume-of-use?	yes
2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use?	no
a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?	
b. Describe the program:	
All new accounts require meters.	
3. Number of previously unmetered accounts fitted with meters during report year.	0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	
b. Describe the feasibility study:	
Staffing unavailable for this. See below.	
2. Number of CII accounts with mixed-use meters.	0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.	24

C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	
No budget for this.	

E. Comments

Number of mixed use meters is unknown. Mixed use commercial meters are retrofitted to dedicated irrigation meters when reclaimed water is provided. City Council Resolution R-296437 restricts staffing levels through FY2007, which hampers the Water Conservation Section's ability to perform and/or implement the switch of mixed use meters to dedicated potable water irrigation meters.

Reported as of 10/

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	7911
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	199
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	1508
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	2461
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	07/01/2002

b. Description of marketing / targeting strategy:

Bill messages, direct mailers, phone solicitation.

2. Number of Surveys Offered.	47
3. Number of Surveys Completed.	37
4. Indicate which of the following Landscape Elements are part of your survey:	
a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes
5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Customers are eligible for annual follow-up surveys and on-going customer support.

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	yes
2. Number of CII mixed-use accounts with landscape budgets.	137
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	no

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services? yes

a. If YES, describe below:

Bill messages are used to advertise our programs.

6. Do you have irrigated landscaping at your facilities? yes

a. If yes, is it water-efficient? yes

b. If yes, does it have dedicated irrigation metering? yes

7. Do you provide customer notices at the start of the irrigation season? yes

8. Do you provide customer notices at the end of the irrigation season? yes

D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	555021	555021
2. Actual Expenditures	329636	

E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

F. Comments

Reported as of 10/

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? yes

   a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

   SDG&E at times offers $75 rebates.

2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate? 125
4. Number of rebates awarded. 5268

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	205934	205934
2. Actual Expenditures	35705	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

   a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Budget for HEWs is for both Commercial and Residential.

Reported as of 10/

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.

Public Education Central to the overall water conservation goal is an enhanced public education program. Public education promotes new plans as well as the existing foundation of conservation programs. The public can't cooperate without being informed, but they also must be convinced. The campaign is structured to reach schoolchildren as well as adults. Elementary students design the aforementioned posters promoting water conservation. Top entries receive prizes as well as extensive public recognition. Water Conservation staff members actively participate in community fairs, providing informational brochures on the various programs and promoting both simple and highly technical conservation measures. Additional components of this program include: updating and maintaining the Department*s and Water Conservation web-site, providing more and better quality brochures and fact sheets that have a centralized theme for water conservation, advertising, working with local television and radio news stations, and coordinating with the CWA, MWD and other local agencies on regional water conservation efforts. In FY2003, the Section's focused on placing articles in community newsletters, participation in television news, and developing "month-to-month" water conservation tips, that can be given to all media formats.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	yes	1
b. Public Service Announcement	yes	7
c. Bill Inserts / Newsletters / Brochures	yes	260000
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	yes	5
f. Special Events, Media Events	yes	20
g. Speaker's Bureau	yes	23
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	320307	320307
2. Actual Expenditures	379010	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Reported as of 10/

BMP 08: School Education Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1.Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	47	10117	33
Grades 4th-6th	yes	285	17037	15
Grades 7th-8th	yes	0	0	0
High School	yes	0	0	0

3. Did your Agency's materials meet state education framework requirements? yes

4. When did your Agency begin implementing this program? 09/09/1990

B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

This BMP is provided region-wide by the San Diego County Water Authority (SDCWA). The data is provided by the SDCWA and is approximate. The City also promotes an Annual Water Conservation Poster Contest.

Reported as of 10/

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option?	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	172	25	19
b. Number of New Surveys Completed	39	15	11
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	5	2	2
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	3	2	1

CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	yes	yes	yes
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	yes	yes

Agency CII Customer Incentives	Budget ($/Year)	No. Awarded to Customers	Total $ Amount Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	50000	843	148693

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	no
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	1.03
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	2.44

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	122002	122002
2. Actual Expenditures	281242	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Budget for CII vouchers is contained in the activity group as well.

Reported as of 10/

BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

1. Did your agency implement a CII ULFT replacement program in the reporting year? If No, please explain why on Line B. 10. — Yes

A. Targeting and Marketing

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

- Consumption ranking
- Potential savings
- CII Sector or subsector
- CII ULFT Study subsector targeting

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

The City particpates in the SDCWA's voucher program. SDCWA's response will answer this question in detail, however the City also has SDMC 147.04, the City's "Plumbing Retrofit Upon Change of Ownership"(Retrofit Upon Resale Ordinance). Potential savings appears to be the most effective. Numerous referrals received from our CII survey program.

2. How does your agency advertise this program? Check all that apply.

- Bill insert
- Bill message
- Newsletter
- Telephone
- Web page
- Newspapers
- Trade publications
- Other print media
- Trade shows and events

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

SDCWA could answer this question more effectively. Bill inserts, brochures, community events and trade shows.

B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) — Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? — Yes

3. What is the total number of customer accounts participating in the program during the last year ?

CII Subsector	Number of Toilets Replaced			
4.	**Standard Gravity Tank**	**Air Assisted**	**Valve Floor Mount**	**Valve Wall Mount**
a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	0	0	0	0

d. Health	0	0	0	0
e. Industrial	0	0	0	0
f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Government	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design.

Rebate or voucher

6. Does your agency use outside services to implement this program? Yes

a. If yes, check all that apply.

Consultant

7. Participant tracking and follow-up.

Letter
Telephone
Site Visit

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business	4
b. Inadequate payback	5
c. Inadequate ULFT performance	3
d. Lack of funding	5
e. American's with Disabilities Act	2
f. Permitting	2

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other isues affecting program implementation or effectiveness.

Many businesses will not change out toilets unless the payback period is less than 1 year.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

See previous year's responses.

C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	Budgeted	Actual Expenditure
a. Labor	0	0
b. Materials	0	0
c. Marketing & Advertising	0	0

d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	0
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	0

D. Comments

See San Diego County Water Authority's response.

Reported as of 10/

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

Rate Structure Data Volumetric Rates for Water Service by Customer Class

1. Residential

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Increasing Block
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

2. Commercial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

3. Industrial

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

4. Institutional / Government

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

5. Irrigation

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

6. Other

a. Water Rate Structure	Uniform
b. Sewer Rate Structure	Uniform
c. Total Revenue from Volumetric Rates	$0

d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	$0

B. Conservation Pricing Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

There is no separate budget for this BMP.

D. Comments

Annual report with revenue still under review by City Auditor due to investigations. Audited amounts not available at the time of the BMP submittal.

Reported as of 10/

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is this a full-time position?	yes
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?	no
4. Partner agency's name:	
5. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	100%
b. Coordinator's Name	Luis Generoso
c. Coordinator's Title	Recycling Program Manager
d. Coordinator's Experience and Number of Years	13.5 in Water Conservation
e. Date Coordinator's position was created (mm/dd/yyyy)	06/01/1991
6. Number of conservation staff, including Conservation Coordinator.	22

B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	1426671	1426671
2. Actual Expenditures	1475425	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

Expenditures include salary and fringe.

Reported as of 10/

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area? yes

a. If YES, describe the ordinance:

See SDMC in previous year's submittal.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

San Diego.	Per SDMC.

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no

2. Describe measures that prohibit water uses listed above:

Water Waste Investigations Water Conservation Program staff respond to water waste complaints generated by citizens throughout the Department*s service area. Staff contact the property owner or manager and work to resolve all kinds of water waste concerns and their associated hazards. Water waste complaints can range drastically, yet a typical example would be a broken sprinkler head which is wasting 10 to 15 gallons per minute and flooding adjacent properties

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	no
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	no
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	no
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to	

ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	no
4. Does your agency include water softener checks in home water audit programs?	no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	225382	225382
2. Actual Expenditures	67457	

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

E. Comments

Reported as of 10/

BMP 14: Residential ULFT Replacement Programs

Reporting Unit:	BMP Form Status:	Year:
City of San Diego	**100% Complete**	**2004**

A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes

Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	7454	4663
Total	**7454**	**4663**

6. Describe your agency's ULFT program for single-family residences.

The ULFT Toilet Voucher Program promotes the incentive-based upgrade of existing fixtures to water-efficient models. Customers receive vouchers that reduce the cost of water efficient toilets that replace existing ones using at least 3.5 gallons per flush. The voucher program is estimated to provide over 9 million gallons of water savings each day.

7. Describe your agency's ULFT program for multi-family residences.

As previous.

8. Is a toilet retrofit on resale ordinance in effect for your service area? yes

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

San Diego	No citations.

B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	691521	691521
2. Actual Expenditures	524902	

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

D. Comments

ULFT programs for Residential and Commercial are combined budgetarily.

Reported as of 10/

APPENDIX H

DROUGHT RESPONSE MATRIX – FIRM DEMANDS

STAGES:	Voluntary	SDCWA Supply Augmentation	Mandatory Cutbacks (includes 50% cutback)
POTENTIAL SDCWA DROUGHT ACTIONS:	* Ongoing BMP implementation * Monthly monitoring of supply conditions and storage levels * Call for voluntary conservation * Draw from planned SDCWA carryover storage	* Secure transfer option contracts * Buy phase 1 spot transfers (cost at or below Tier 2 rate) * Call transfer options contracts * Draw from planned SDCWA carryover storage * Buy phase 2 spot transfers (cost at or above Tier 2 rate)	* Implement allocation plan * Utilize ESP supplies

APPENDIX I

15.2 Assessment of Performance Goals – PE

Table 15-3 presents the matrix of SDWD service goals for the Probable Earthquake (Rose Canyon M 6.5) and identifies the SIP packages which provide adequate upgrades to meet each of the service goals. With the cost-benefit analysis, Table 15-3 can be used to determine which SIP package will provide adequate coverage of the service goals, or whether the service goals are reasonable, with respect to the upgrades which may be effectively made within the proposed SIP packages.

Service Goal	Description	SIP-1	SIP-2	SIP-3	SIP-4
1	Minimal secondary damage and risk to public	No	Yes	Yes	Yes
2	Limit to extensive damage to system facilities	No	No	No	Yes
3	All water introduced into the Distribution system minimally disinfected	No	No	Yes	Yes
4	Provide limited fire service at fire hydrants for first 24 hours after earthquake	No	No	Yes	Yes
5	Normal fire service to all hydrants within 10 days	No	No	Yes	Yes
6	Hospitals, Critical Care, Emergency Relief Facilities: Impaired service within 1 days	Yes	Yes	Yes	Yes
7	Hospitals, Critical Care, Emergency Relief Facilities: Impaired service within 2 days	Yes	Yes	Yes	Yes
8	Hospitals, Critical Care, Emergency Relief Facilities: Normal Service within 5 days	No	Yes	Yes	Yes
9	All Users: Impaired service within 7 days	No	No	Yes	Yes
10	All Users: Normal service within 10 days	No	No	Yes	Yes
	Goals Met	2	4	9	10

Table 15-3. SIP Packages Meeting SDWD Water System Service Goals – Probable Earthquake

APPENDIX J

Non-Firm or Interruptible Load - Customers on a special reduced rate that agree to curtail electrical use upon request.

Off-peak - The period during a day with the lowest demand/usage of electricity by customers. Off-peak hours are determined by the billing rate (tariff) applied to different customers and the time of year (Winter or Summer). Off-peak hours are generally considered to be late evening and early morning hours, plus weekends and holidays. Billing rates are lowest for off-peak use.

On-peak - The period during a day with the highest demand/usage of electricity by customers. On-peak hours are determined by the billing rate (tariff) applied to different customers and the time of year (Winter or Summer). On-peak hours are generally considered mid-day during the summer months (usually May 1 - September 30) and early evening hours during winter months (October 1 - April 30). Billing rates are usually highest for on-peak use.

Peak demand - The highest average electrical load over an 15 minute period during a billing period.

Public good - The portion of electric bills the CPUC uses to fund state mandated assistance programs for low-income customers and energy efficiency, renewable energy and energy development programs.

Semi-peak - The period during a day or night with an average demand/usage of electricity by customers. Semi-peak hours are determined by the billing rate (tariff) applied to different customers and the time of year (Winter or Summer). Semi-peak rates are generally lower than on-peak rates, but higher than off-peak rates.

Service Interruptions (rolling blackouts) - Curtailment of firm load (residential and business customers) with one hour rotating circuit outages.

Stage 1 Emergency - Declared at any time it is clear that an Operating Reserve shortfall (i.e. less than 7%) is unavoidable, or is forecast to occur within the next two hours. Requests for voluntary conservation.

Stage 2 Emergency - Declared at any time it is clear that an Operating Reserve shortfall (i.e. less than **5%)** is unavoidable, or is forecast to occur within the next two hours. Requests for Non-firm or interruptible load curtailments.

Stage 3 Emergency - Declared at any time it is clear that a severe Operating Reserve shortfall (i.e. less than **1½ %**) is unavoidable, or is forecast to occur within the next two hours. Requests for firm load curtailments (service interruptions/rolling blackouts).

Standby power - A backup source of power (i.e. a second utility feed or on-site engine driven generator) used to power critical loads when primary source of electrical energy is disrupted.

Wheeling - the use of transmission facilities of one system to transmit energy from a generator to customers on another system by agreement which includes a wheeling charge..

City of San Diego
Electrical Load Curtailment Notification Protocol

Background

ATTACHMENT 2

Due to the energy supply crisis in the State of California, the City of San Diego needs to establish a clearly defined method to obtain and disseminate timely accurate information to staff responsible for the services delivered by the City's Public Health and Safety Departments. The Emergency Management Section of the Central Operations Division of Fire and Life Safety Services (F&LSS) is the designated point of contact in the City for the distribution of information associated with major emergencies or disasters. In order to facilitate the accurate transfer of information and ensure timely distribution, the F&LSS Communications Center (858-974-9891) has been established as the Emergency Management's 7/24 point of contact for outside agencies.

The procedure below was developed to be consistent with the State mandated Standardized Emergency Management System (SEMS), City of San Diego Emergency Operations Plans (EOP) and departmental operations procedures.

Procedure

2. San Diego Gas & Electric notifies the San Diego County Operation Area/Office of Disaster Preparedness (ODP) Duty Staff Officer with critical information, such as immanent planned power outages.

3. ODP contacts F&LSS Communications Center and requests that the information be passed on to the Duty Emergency Management representative.

4. Duty F&LSS Dispatch Captain or Dispatch Supervisor pages the Emergency Management Director or Coordinator to call dispatch for important information from ODP.

5. Emergency Management representative contacts the Duty Dispatch Captain and discusses appropriate action to be initiated based on the information provided and past practice.

6. Emergency Management will immediately make contact with the City personnel and Dispatch Center listed below, when warranted:

    - P. Lamont Ewell, Assistant City Manager
    - George Loveland, Senior Deputy City Manager
    - Fire Communications Dispatch Captain
    - Metropolitan Wastewater...COMC
    - SDPD Communications Supervisor
    - Water Department
    - Station 38
    - Information Technology and Communications

7. Dispatch Centers/Departments will make notifications and initiate actions based on internal policy and direction from departmental management.

8. Notify mayor and Council Member Offices

D.P. Lee
Revised: January 18, 2001

APPENDIX K

Article 7: Water System

Division 38: Emergency Water Regulations

("Emergency Water Regulations"
added 10-19-1998 by O-18596 N.S.)

§67.3801 Declaration of Emergency

That the City Manager be, and he is hereby authorized to determine and declare that a water shortage emergency exists in any and/or all parts of The City of San Diego, and upon such determination, to promulgate such regulations, rules and conditions relative to the time of using water, the purpose or purposes for which it may be used, and such other necessary limitations as will, in his opinion, relieve the water shortage in any such section or sections of The City.
(Renumbered from Sec. 67.38 and retitled to "Declaration of Emergency" on 10-19-1998 by O-18596 N.S.)

§67.3802 Comprehensive Water Conservation Plan

There is hereby established a City of San Diego Comprehensive Water Conservation Plan.
(Renumbered from Sec. 67.38.1 and retitled to "Comprehensive Water Conservation Plan" on 10-19-1998 by O-18596 N.S.)

§67.3803 Declaration of Policy

The City Council, by and through its Water Department, finds and determines that a water shortage could exist based upon the occurrence of one or more of the following conditions:

(a) A general water supply shortage due to increased demand or limited supply.

(b) Distribution or storage facilities of the Metropolitan Water District of Southern California, the San Diego County Water Authority, or the City of San Diego become inadequate.

(c) A disruption of the supply, storage and distribution facilities of the Metropolitan Water District of Southern California, the San Diego County Water Authority, or the City of San Diego occurs.

It is hereby declared that, because of the conditions prevailing in the City of San Diego, the general welfare requires that the City maximize the beneficial use of its available water resources to the extent to which they are capable, and that the waste or unreasonable use, or unreasonable method of use of water be prevented and the conservation of such water is to be extended with a view to the reasonable and beneficial use thereof in the interests of the people of the City of San Diego and for the public welfare.
(Renumbered from Sec. 67.38.2 and amended 10-19-1998 by O-18596 N.S.)

§67.3804 Authority to Implement Water Conservation Stages

The City Manager, or his designee, upon the recommendation of the Director of the Water Department, and following public notice, is authorized and directed to implement the applicable provisions of sections 67.3801 through 67.38.11, upon his determination that such implementation is necessary to protect the public welfare and safety under the following conditions:

(a) In the event of an unforeseeable disaster or water emergency such as an earthquake, aqueduct break, or other major disruption in the water supply, the City Manager, or his designee, is authorized to implement the emergency provisions of sections 67.3801 through 67.38.11. Public notice will follow enactment of said provision.

(b) In the event of a foreseeable water emergency such as extended drought conditions, the City Manager, or his designee, is authorized to implement the applicable provisions of sections 67.3801 through 67.38.11 as provided herein, after holding a public hearing before the City Council.

(Renumbered from Sec. 67.38.3, retitled to "Authority to Implement Water Conservation Stages" and amended 10-19-1998 by O-18596 N.S.)

§67.3805 Application

(a) The provisions of Sections 67.3801 through 67.38.11 shall apply to all persons, customers and property served by the Water Department wherever situated; except as provided in section 67.3805(b).

(b) The use of potable water for industrial manufacturing, processing, or research and development is exempt from the provisions of section 67.3806(d), if all of the following conditions are met: 1) the business is one of the types of businesses described in categories 2000 through 3999, 7390, and 8730 of the Standard Industrial Classification Code, a copy of which is on file with the

Office of the City Clerk as Document No. 00-18596-1; 2) the business is located in an area where reclaimed water is available; 3) the business uses reclaimed water on its premises to the full extent possible; and 4) the business participates in all applicable City water conservation programs that are considered Best Management Practices by the California Urban Water Conservation Council. A list of the City's water conservation programs that are Best Management Practices is on file with the Office of the City Clerk as Document No. 00-18596-2.

(Renumbered from Sec. 67.38.4 and amended 10-19-1998 by O-18596 N.S.)

§67.3806 Water Conservation Stages

It is unlawful for any customer of The City of San Diego Water Department to make, cause, use or permit the use of water from the City for residential, commercial, industrial, agricultural, governmental or any other purpose in a manner contrary to any provision of Sections 67.3801 through 67.38.11, or in an amount in excess of that use permitted by the following conservation stages which are in effect pursuant to action taken by the City Manager, or his designee, in accordance with the provisions of sections 67.3801 through 67.38.11. It is unlawful for any person to waste water or to use it unreasonably.

(a) Unreasonable uses of water shall include, but are not limited to, the following practices:

(1) A customer shall not let water leave the customer's property by drainage onto adjacent properties or public or private roadways or streets due to excessive irrigation and/or uncorrected leaks.

(2) A customer will not fail to repair a water leak.

(3) A customer will not use water to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate safety or sanitation hazards.

The following stages shall take effect upon declaration as herein provided.

(b) Stage 1. Voluntary Compliance - Water Watch.

Stage 1 applies during periods when the possibility exists that the City of San Diego Water Department will not be able to meet all of the water demands of

its customers. All elements of Stage 2 shall during Stage 1 apply on a voluntary basis only.

(c) Stage 2. Mandatory Compliance - Water Alert.

Stage 2 applies during periods when the probability exists that the City of San Diego Water Utilities Department will not be able to meet all of the water demands of its customers.

Upon implementation by the City Manager and publication of notice, the following water conservation measures shall apply to except when reclaimed water is used:

(1) Lawn watering and landscape irrigation, including construction meter irrigation, is permitted only during designated hours on designated days. Watering is permitted at any time if:

(A) a hand-held hose equipped with a positive shut-off nozzle is used, or

(B) a hand-held container is used, or

(C) a drip irrigation system is used.

Commercial nurseries, commercial sod farms and similarly situated establishments are exempt from Stage 2 irrigation restrictions but will be required to curtail all nonessential water use.

(2) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment, is permitted at any time with a hand-held bucket or a hand-held hose equipped with a positive shut-off nozzle for quick rinses.

Washing may be done at any time on the immediate premises of a commercial car wash or commercial service station, or by a mobile car wash or on-site car wash using high pressure washing equipment. Further, such washings are exempted from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles to transport food and perishables.

(3) The overfilling of swimming pools, spas, ponds and artificial lakes is prohibited.

(4) Irrigation of golf courses, parks, school grounds and recreation fields is permitted only during designated hours on designated days.

(5) Use of water from fire hydrants shall be limited to fire fighting, related activities or other activities necessary to maintain the health, safety and welfare of the citizens of San Diego.

(6) All restaurants are prohibited from serving water to their customers except when specifically requested by the customers.

(7) Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate fire or sanitation hazards.

(8) Ornamental fountains may operate if they recirculate water. Ornamental fountains that do not recycle water are prohibited.

(9) Construction operations receiving water from a construction meter or water truck shall not use water unnecessarily for any purposes other than those required by regulatory agencies. Construction projects requiring watering for new landscaping materials should adhere to the designated irrigation hours associated with subsection (1) of State 2.

(d) Stage 3. Mandatory Compliance - Water Warning.

Stage 3 applies during periods when the City of San Diego Water Utilities Department will not be able to meet all of the water demands of its customers. Upon implementation by the City Manager and publication of notice, the following water conservation measures shall apply except when reclaimed water is used:

(1) Lawn watering and landscape irrigation, including with a hand-held hose equipped with a positive shut-off nozzle, is permitted only during designated hours on designated days. Watering is permitted at any hour, on any day, if a hand-held container or drip irrigation system is used.

(2) Commercial nurseries shall reduce water use by an amount determined by the City Council.

(3) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment is permitted only during designated hours on designated days with a hand-held bucket or a hand-held hose equipped with a positive shut-off nozzle for quick rinses. Washing is permitted at any time on the immediate premises of a commercial car wash. The use of water by all types of commercial car washes not using partially reclaimed or recycled water shall be reduced in volume by an amount determined by the City Council. Further, such washings are exempt from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles to transport food and perishables.

(4) The overfilling of swimming pools and spas is prohibited. The filling or refilling of ponds and artificial lakes is prohibited.

(5) Watering golf courses, parks, school grounds and recreation fields is permitted only during designated hours on designated days, except golf course greens.

(6) Use of water from fire hydrants shall be limited to fire fighting or other activities immediately necessary to maintaining the health, safety and welfare of the citizens of San Diego.

(7) All restaurants are prohibited from serving water to their customers except when specifically requested by the customers.

(8) Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate fire or sanitation hazards.

(9) The operation of any ornamental fountain or similar structure is prohibited except for short periods of time to prevent damage.

(10) The number of new construction meters shall not exceed the existing number of currently authorized meters. A new meter shall be issued only when an old meter is returned. Construction projects requiring water from a construction meter or a water truck shall not use water unnecessarily for any purposes other than those required by regulatory

agencies. Construction projects requiring water for new landscapes shall adhere to the designated days and times as set forth in subsection (1) of Stage 2. Further, construction projects necessary to maintaining the health, safety and welfare of the public are exempt from these regulations.

(11) The use of water for commercial manufacturing or processing purposes shall be reduced in volume by an amount determined by the City Council. This provision does not apply to businesses which are exempt from water use restrictions pursuant to section 67.3805(b).

(e) Stage 4. Mandatory Compliance - Water Emergency

Stage 4 applies when a major failure of any supply or distribution facility, whether temporary or permanent, occurs in the water distribution system of the State Water Project, Metropolitan Water District, San Diego County Water Authority, or City of San Diego water facilities.

Upon implementation by the City Manager and publication of notice, the following measures shall apply except when reclaimed water is used:

(1) All outdoor irrigation of turf and ground covers is prohibited with the exception of plant materials classified to be rare, exceptionally valuable or essential to the well being of the public at large or rare animals. Irrigation of trees and shrubs is permitted only by hand-held hose equipped with a positive shut-off nozzle, hand-held container, or drip irrigation system. Greywater may be used in accordance with Health Department regulations to irrigate fruit trees, ground covers and ornamental trees and shrubs. Greywater is defined as household wastewater other than toilet waste.

(2) The use of water at commercial nurseries, commercial sod farmers and similarly situated establishments shall be reduced in volume by an amount determined by the City Council. Greywater may be used in accordance with Health Department regulations to irrigate fruit trees, ground covers and ornamental trees and shrubs.

(3) The washing of automobiles, trucks, trailers, boats, airplanes and other types of mobile equipment is prohibited. The use of water by all types of commercial car washes or commercial vehicle service stations and not in the immediate interest of the public health, safety and welfare

shall be reduced in volume by an amount determined by the City Council. Further, such washings are exempt from these regulations where the health, safety and welfare of the public is contingent upon frequent vehicle cleanings such as garbage trucks and vehicles used to transport food and perishables.

(4) The filling, refilling or adding of water to swimming pools, spas, ponds and artificial lakes is prohibited.

(5) The watering of all golf course areas, except greens, is prohibited.

(6) Use of water from fire hydrants shall be limited to fire fighting or other activities immediately necessary to maintain the health, safety and welfare of the citizens of San Diego.

(7) All Restaurants are prohibited from serving water to their customers except when specifically requested by the customers.

(8) Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios or other paved areas, except to alleviate immediate fire or sanitation hazards.

(9) The operation of any ornamental fountain or similar structure is prohibited except for short periods of time to prevent damage.

(10) The use of water for commercial, manufacturing or processing purposes shall be reduced in volume by an amount determined by the City Council.

(11) All sales of non-reclaimed water outside of the City limits shall be discontinued, with the exception of sales previously approved by the City Council.

(12) No new construction meters will be issued. Construction water shall not be used for earth work or road construction purposes. Construction projects necessary to maintaining the health, safety and welfare of the public are exempt from these regulations.

(13) Except as to property for which a building permit has been heretofore issued, no new building permit(s) shall be provided, except in the following circumstances:

(A) For projects necessary to protect the public's health, safety, and welfare;

(B) When using reclaimed water;

(C) When the recipient of the building permit can demonstrate that no net increase in water use will occur; or

(D) Where the recipient of the building permit provides a conservation offset. For purposes of the section, "conservation offset" shall mean the implementation of proven conservation techniques which, when installed, will result in a reduction equal to demand of the proposed use. A conservation offset may be effected by paying a fee established by the City Manager or his designee to the City Treasurer in an amount necessary to cover the cost of implementing such conservation techniques. The fee will be based on the conservation offset required for an equivalent dwelling unit. Such fee shall apply to residential as well as commercial and industrial buildings, and may be adjusted from time to time as determined by the City Manager or his designee.

(14) Stage 4 unless sooner terminated by the City Council, shall terminate September 30, 1991, unless prior to said date the Council acts to extend it.

(Renumbered from Sec. 67.38.5 and amended 10-19-1998 by O-18596 N.S.)

§67.3807 Mandatory Conservation Phase Implementation

The Water Department shall monitor the projected supply and demand for water, by its customers, on a daily basis during periods of emergency or drought and shall recommend to the City Manager the extent of the conservation required through the implementation and/or termination of particular conservation stages to prudently plan and supply water to its customers. Thereafter, the City Manager may order the implementation or termination of the appropriate phase of water conservation in accordance with the applicable provisions of sections 67.3801 through 67.38.11. The declaration of any stage beyond Stage 1 shall be made by public announcement and shall be published a minimum of one (1) time for three (3) consecutive days in a daily newspaper of general circulation. The stage designated shall become effective immediately upon announcement.

(Renumbered from Sec. 67.38.6 and amended 10-19-1998 by O-18596 N.S.)

§67.3808 Penalty

It shall be unlawful for any person, corporation or association to violate the provisions of Sections 67.3801 through 67.38.11. Violations of these provisions shall be a misdemeanor subject to penalties provided in San Diego Municipal Code section 12.0201. The Water Department can alternatively seek injunctive relief in the Superior Court pursuant to San Diego Municipal Code section 12.0202 or pursue any administrative remedy provided in Chapter 1. In addition to any other remedies which the Water Department may have for the enforcement of this Division, service of water shall be discontinued or appropriately limited to any customer who willfully uses water in violation of any provision of this Division.
(Renumbered from Sec. 67.38.7 and amended 10-19-1998 by O-18596 N.S.)

§67.3809 Severability

If any provision, section, subsection, sentence, clause or phrase of sections 67.3801 through 67.38.11, or the application of same to any person or set of circumstances, is for any reason held to be unconstitutional, void or invalid, the invalidity of the remaining portions of sections 67.3801 through 67.38.11 shall not be affected, it being the intent of the City Council in adopting Sections 67.3801 through 67.38.11 that no portions, provisions, or regulations contained herein shall become inoperative, or fail by reason of the unconstitutionality of any other provision hereof, and all provisions of sections 67.3801 through 67.38.11 are declared to be severable for that purpose.
(Renumbered from Sec. 67.38.8 and amended 10-19-1998 by O-18596 N.S.)

§67.3810 Citations

Code compliance officers/code compliance supervisors of The City of San Diego are hereby authorized, empowered and given the duty to enforce provisions of the San Diego Municipal Code and misdemeanors designated in the State Codes to issue citations for violations of said Codes under the provisions of Sections 836.5 and 853.6 of the Penal Code of the State of California when violations occur in the City of San Diego.
(Renumbered from Sec. 67.38.9 on 10-19-1998 by O-18596 N.S.)

§67.3811 Publication of Terms of Water Use

That upon such emergency declaration by the City Manager, it shall be his duty to have public notice given by publishing a notice giving the extent, terms and conditions respecting the use and consumption of water, at least once in the official newspaper of said City; that upon such declaration and publication of such notice due and proper

notice shall be deemed to have been given each and every consumer supplied with water by The City of San Diego.
(Renumbered from Sec. 67.39 and retitled to "Publication of Terms of Water Use" on 10-19-1998 by O-18596 N.S.)

APPENDIX L

Article 2: Code Enforcement
Judicial and Administrative Remedies

Division 2: Judicial Remedies
("Judicial Remedies"
added 8–10–1993 by O–17956 N.S.)

§12.0201 Criminal Violations— Misdemeanors and Infractions

It shall be unlawful for any person to violate any provision or to fail to comply with any of the requirements of this Code. A violation of any of the provisions or failing to comply with any of the mandatory requirements of this Code shall constitute a misdemeanor; except that notwithstanding any other provision of this Code, any such violation constituting a misdemeanor under this Code may, in the discretion of the City Attorney, be charged and prosecuted as an infraction; and, with the further exception that any violation of the provisions relating to parking, operation of bicycles, operation of motor vehicles, and use of freeways, highways and streets by animals, bicycles, motor vehicles or pedestrians shall constitute an infraction. Any person convicted of a misdemeanor under the provisions of this Code, unless provision is otherwise herein made, shall be punishable by a fine of not more than one thousand dollars ($1000) or by imprisonment in the County Jail for a period of not more than six months or by both fine and imprisonment. Any person convicted of an infraction under the provisions of this Code, unless provision is otherwise herein made, shall be punishable by fine only as follows: Upon a first conviction, by a fine of not exceeding two hundred fifty dollars ($250) and for a second conviction or any subsequent conviction within a period of one year, by a fine of not exceeding five hundred dollars ($500).

Each such person shall be charged with a separate offense for each and every day during any portion of which any violation of any provision of this Code is committed, continued or permitted by such person and shall, upon conviction, be punished accordingly.
(Renumbered from Sec. 13.0201 and retitled to "Criminal Violations— Misdemeanors and Infractions" on 8–10–1993 by O–17956 N.S.)

§12.0202 Civil Violations—Injunctions and Civil Penalties

(a) In addition to any other remedy provided by this Code, any provision of this Code may be enforced by injunction issued by the Superior Court upon a suit brought by The City of San Diego.

APPENDIX M

(R-2004-440)

RESOLUTION NUMBER R- 298781

ADOPTED ON JAN 13 2004

RESOLUTION OF THE CITY COUNCIL REGARDING THE STUDY OF INCREASED ASPECTS OF WATER REUSE

WHEREAS, the Council of the City of San Diego adopted Resolution No. R-291210 on January 19, 1999, directing the City Manager not to spend any monies on water repurification until options for such reuse of water are evaluated and further direction is given by the Council; and

WHEREAS, the State of California in June 2003 issued a report entitled "Water Recycling 2030: Recommendations of California's Recycled Water Task Force," which called for a community-based process to evaluate a wide range of potential uses of recycled water; and

WHEREAS, on October 10, 2003, the City Manager issued City Manager's Report No. 03-203 entitled "Status Report on City of San Diego Long-Range Water Resources Plan (2002-2030)," which identified reclaimed water as an important source of a locally produced water supply and identified the City's two water reclamation plants: the North City Water Reclamation Plant and the South Bay Water Reclamation Plant, as important sources of reclaimed water to reduce the City's imported potable water demand; and

WHEREAS, the City's Natural Resources and Culture Committee on November 19, 2003 heard a full presentation on Alternative Water Sources, including testimony on the recently issued "Water Recycling 2030: Recommendations of California's Recycled Water Task Force" and unanimously recommended that the City Manager conduct a study of all aspects of increased water reuse; NOW, THEREFORE,

BE IT RESOLVED, by the Council of the City of San Diego, that the City Manager is directed to conduct a study of one year duration evaluating all aspects of a viable increased water reuse program, including but not limited to groundwater storage, expansion of the distribution system, reservoirs for reclaimed water, livestream discharge, wetlands development, and reservoir augmentation. The study and report of same shall include a general assessment of costs and benefits of such projects including, but not limited to, consideration of public health, public acceptance, water costs, water supply reliability issues, compilation of research/studies concerning reservoir augmentation, and information concerning potential impacts of pharmaceuticals, endocrine disruptors, personal care products, and additional constituents of the wastewater stream on water quality and health. The study and report, when completed, shall be calendared before the Natural Resources and Culture Committee for such action as it deems appropriate.

APPROVED: CASEY GWINN, City Attorney

By Ted Bromfield

Ted Bromfield
Senior Deputy City Attorney

TB:mb
11/20/03
Or.Dept:NRC
R-2004-440

APPENDIX N

(O-89-241)
ORDINANCE NUMBER O-17327 (NEW SERIES)
ADOPTED ON JULY 24, 1989

AN ORDINANCE AMENDING CHAPTER VI, ARTICLE 4, OF THE SAN DIEGO MUNICIPAL CODE BY ADDING DIVISION 8, SECTIONS 64.01801-64.0810, RELATING TO THE ESTABLISHMENT OF A WATER RECLAMATION MASTER PLAN AND IMPLEMENTING PROCEDURES FOR THE CITY OF SAN DIEGO.

BE IT ORDAINED, by the Council of The City of San Diego, as follows:

Section 1. That Chapter VI, Article 4, of the San Diego Municipal Code be and the same is hereby amended by adding Division 8, Sections 64.0801 through 64.0810, to read as follows:

DIVISION 8

SEC. 64.0801. FINDINGS, PURPOSE AND INTENT

The Council of The City of San Diego finds that:

a) the people of the State of California have a primary interest in the development of facilities to reclaim water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state; (California Water Code section 13510); and

b) conservation of all available water resources requires the maximum reuse of wastewater for beneficial uses of water (Water Code section 461); and

c) continued use of potable water for irrigation of greenbelt areas and for other uses where the use of reclaimed water is suitable may be an unreasonable use of such water where reclaimed water is available; and

d) the state policies described above are in the best interest of the City. The majority of jurisdictions in San Diego County have adopted measures to promote water reclamation. This ordinance is necessary to protect the common water supply of the region which is vital to public health and safety, and to prevent endangerment of public and private property. San Diego County is highly dependent on limited imported water for domestic, agricultural and industrial uses. The reliability of the supply of imported water is

uncertain. By developing and utilizing reclaimed water, the need for additional imported water can be reduced. In light of these circumstances, certain uses of potable water may be considered unreasonable or to constitute a nuisance where reclaimed water is available or production of reclaimed water is unduly impaired.

SEC. 64.0802 WATER RECLAMATION POLICY

It is the policy of the City that reclaimed water shall be used within its jurisdiction wherever feasible, and consistent with legal requirements, preservation of public health, safety and welfare, and the environment.

SEC. 64.0803 DEFINITIONS

The following terms are defined for purposes of this ordinance:

(a) AGRICULTURAL PURPOSES: Agricultural purposes include the growing of field and nursery crops, row crops, trees, and vines and the feeding of fowl and livestock.

(b) ARTIFICIAL LAKE: A human-made lake, pond, lagoon, or other body of water that is used wholly or partly for a landscape impoundment, a restricted recreational impoundment or a non-restricted recreational impoundment.

(c) COMMERCIAL OFFICE BUILDING: Any building for office or commercial uses with water requirements which include, but are not limited to, landscape irrigation, toilets, urinals and decorative fountains.

(d) GREENBELT AREAS: A greenbelt area includes, but is not limited to, golf courses, cemeteries, parks and landscaping.

(e) INDUSTRIAL PROCESS WATER: Water used by any industrial facility with process water requirements which include, but are not limited to, rinsing, washing, cooling and circulation, or construction, including any facility regulated by the industrial waste water discharge ordinance of the City. (Municipal Code, Chapter VI, Article 4).

(f) OFF-SITE FACILITIES: Water (or reclaimed water) facilities from the source of supply to the point of connection with the on-site facilities, normally up to and including the water meter.

(g) ON-SITE FACILITIES: Water (or reclaimed water) facilities under the control of the owner, normally downstream from the water meter.

(h) POTABLE WATER: Water which conforms to the

federal, state and local standards for human consumption.

(i) RECLAIMED WATER: Water which, as a result of treatment of wastewater, is suitable for a direct beneficial use or controlled use that would not otherwise occur. (See Water Code section 13050(n).)

(j) RECLAIMED WATER DISTRIBUTION: A piping system intended for the delivery of reclaimed water separate from any potable water distribution system.

(k) WASTE DISCHARGE: Waste discharge means water deposited, released or discharged into a sewer system from any commercial, industrial or residential source which contains levels of any substance which may cause substantial harm to any water treatment or reclamation facility or which may prevent any use of reclaimed water authorized by law, provided levels exceed those found in water actually delivered to the source of the waste discharge by the water purveyor.

SEC. 64.0804 ADMINISTRATION

(a) GENERAL. The City Manager shall administer, implement and enforce the provisions of this ordinance. Any powers granted to or duties imposed upon the City Manager may be delegated by the City Manager to persons in the employ of the City.

(b) REGULATIONS. The City Manager shall make and enforce regulations necessary to the administration of this ordinance. The Manager may amend such regulations from time to time as conditions require. These regulations shall be consistent with the general policy established herein by the City Council.

SEC. 64.0805 PENALTY FOR VIOLATION

(a) PUBLIC NUISANCE: Discharge of wastes or the use of reclaimed water in any manner in violation of this ordinance or of any permit issued hereunder is hereby declared a public nuisance and shall be corrected or abated as directed by City. Any person creating such a public nuisance is guilty of a misdemeanor.

(b) INJUNCTION: Whenever a use of reclaimed water is in violation of this ordinance or otherwise causes or threatens to cause a condition or nuisance, the City may seek injunctive relief as may be appropriate to enjoin such discharge or use.

(c) PERMIT REVOCATION: In addition to any other statute or rule authorizing termination of reclaimed water service, the City Manager may revoke a permit

issued hereunder if a violation of any provision of this ordinance is found to exist or if use of reclaimed water causes or threatens to cause a nuisance.

(d) PENALTY: Any owner and/or operator who violates any penal provision of this ordinance shall, for each day of violation, or portion thereof, be subject to a fine not exceeding $1,000. In addition, water service to the property may be discontinued.

SEC. 64.0806 WATER RECLAMATION MASTER PLAN

(a) GENERAL: Upon adoption of this ordinance, the City shall prepare and adopt a Water Reclamation Master Plan to define, encourage, and develop the use of reclaimed water within its boundaries. The Master Plan shall be updated every five years. The Master Plan may be one or more documents covering specific portions of the planning area.

(b) CONTENTS OF THE RECLAMATION MASTER PLAN: The Master Plan shall include, but not be limited to, the following:

(1) PLANTS AND FACILITIES. Evaluation of the location and size of present and future reclamation treatment plants, distribution pipelines, pump stations, reservoirs, and other related facilities, including cost estimates and potential financing methods.

(2) RECLAIMED WATER SERVICE AREAS. A designation, based on the criteria set forth in Section 64.0802 and the information derived from Sections 64.0806(b)(1) and (b)(2) of the areas within the City that can or may in the future use reclaimed water in lieu of potable water. Reclaimed water uses can include, but are not limited to, the irrigation of greenbelt and agricultural areas, filling of artificial lakes, and appropriate industrial and commercial uses.

(3) TRIBUTARY AREAS. A designation of proposed tributary areas for each water reclamation facility identified in the Master Plan, providing maps showing locations of major sewers tributary to an existing or proposed plant site, and the tributary area served by the facility.

(4) QUALITY OF WATER TO BE RECLAIMED. An evaluation of water quality with respect to the effect on anticipated uses of reclaimed water to be served by each treatment facility. An evaluation of sources of waste discharge and sewer inflow that may, directly or cumulatively, substantially contribute to adverse water

quality conditions in reclaimed water. In the event that sufficient data is not available, recommendations on an enhanced sampling and monitoring program to provide additional data for further development of reuse options or necessary discharge regulation.

(5) TRIBUTARY PROTECTION MEASURES. Recommendations of control measures and management practices for each designated tributary area to maintain or improve the quality of reclaimed water. Such control measures may include capital improvements to the sewer collection system and waste discharge restrictions for industrial, commercial and residential discharges.

(6) SCHEDULE. A schedule for implementation, including additional planning and pre-design steps, institutional arrangements, permits, land acquisition, design, construction, startup, and facility phasing for each reclaimed water service area.

SEC. 64.0807 MANDATORY RECLAIMED WATER USE

(a) GENERAL. No person or public agency, as used in California Water Code section 13551, shall use water from any source or of quality suitable for potable domestic use for the irrigation of greenbelt areas, or other uses where the use of reclaimed water is suitable, when reclaimed water is available.

(b) IDENTIFICATION OF USERS. Persons or agencies who are mandated to use reclaimed water are to be identified and permitted as described in this section.

(c) EXISTING POTABLE WATER SERVICE:

(1) PRELIMINARY DETERMINATION. Based upon the Master Plan, upon the designation of each reclaimed water service area or the commencement of the design of new reclaimed water facilities, the City shall make preliminary determinations as to which existing potable water customers shall be converted to the use of reclaimed water. Each water customer shall be notified of the basis for a determination that conversion to reclaimed water service will be required, as well as the proposed conditions and schedule for conversion.

(2) NOTICE. The notice of the preliminary determination, including the proposed conditions and time schedule for compliance, and a reclaimed water permit application shall be sent to the water customer by certified mail.

(3) OBJECTIONS. The water customer may file a notice of objection with the City Manager within thirty

(30) days after any notice of determination to comply is delivered or mailed to the customer, and may request reconsideration of the determination or modification of the proposed conditions or schedule for conversion. The objection must be in writing and specify the reasons for the objection. The preliminary determination shall be final if the customer does not file a timely objection. The City Manager shall appoint a panel of three (3) staff members who shall review the objection and shall confirm, modify or abandon the preliminary determination. The panel shall make a final determination within thirty (30) days of the filing of the notice of objection.

(d) DEVELOPMENT AND WATER SERVICE APPROVALS:

(1) CONDITIONS. Upon application by a developer, owner or water customer (herein referred to as "applicant") for a tentative map, subdivision map, land use permit, or other development project as defined by Government Code section 65928, the City Manager shall review the Master Plan and make a preliminary determination whether the current or proposed use of the subject property requires it to be served with reclaimed water or to include facilities designed to accommodate the use of reclaimed water in the future, due to its location within an existing or proposed reclaimed water service area. Based upon such determination, a permit for such use may be required as a condition of approval of any such application, in addition to any other conditions of approval or service.

(2) ALTERATIONS AND REMODELING. On a case by case basis, upon application for a permit for the alteration or remodeling of multi-family, commercial or industrial structures, the City Manager shall review the Master Plan and make a preliminary determination whether the subject property is within a reclaimed water service area (existing or proposed) and shall be served with reclaimed water or include facilities designed to accommodate the use of reclaimed water in the future. Based upon such determination that use of reclaimed water and provision of reclaimed water distribution systems or other facilities for the use of reclaimed water is appropriate, a permit for such use may be required as a condition of approval of the application.

(3) REQUESTED SERVICE. On a case by case basis, upon application for a permit to use reclaimed

water on a property not covered by Sections 64.0807 (d)(1) and (d)(2) above, the City Manager shall review the Master Plan and make a determination whether the subject property shall be served with reclaimed water. Based upon such determination, the application for the permit shall be accepted and processed subject to Section 64.0807(e).

(4) NOTICE OF DETERMINATION. A notice of the basis for the preliminary determination, proposed conditions of approval and schedule for compliance shall be provided to the applicant prior to approval of the development application, or application for water service.

(e) RECLAIMED WATER PERMIT PROCESS: Upon a final determination by the City that a property shall be served with reclaimed water or adoption of a condition of development approval or water service requiring use or accommodation of the use of reclaimed water, the water customer, owner or applicant shall obtain a reclaimed water permit.

(1) PERMIT CONDITIONS. The permit shall specify the design and operational requirements for the applicant's water distribution facilities and schedule for compliance, based on the rules and regulations adopted pursuant to Section 64.0808(a) and shall require compliance with both the California Department of Health Services Wastewater Reclamation Criteria (see California Code of Administrative Regulations, Title 22), and requirements of the Regional Water Quality Control Board.

(2) PLAN APPROVAL. Plans for the reclaimed and non-reclaimed water distribution systems for the parcel shall be reviewed by the City and a field inspection conducted before the permit is granted.

(3) PERMIT ISSUANCE. Upon approval of plans the permit shall be issued. Reclaimed water shall not be supplied to a property until inspection by the City determines that the applicant is in compliance with the permit conditions.

(f) TEMPORARY USE OF POTABLE WATER. At the discretion of the City, potable water may be made available on a temporary basis, until reclaimed water is available. Before the applicant receives temporary potable water, a reclaimed water permit, as described in Section 64.0807(c), must be obtained for new on-site

distribution facilities. Prior to commencement of reclaimed water service, an inspection of the on-site facilities will be conducted to verify that the facilities have been maintained and are in compliance with the reclaimed water permit and current requirements for service. Upon verification of compliance, reclaimed water shall be served to the parcel for the intended use. If the facilities are not in compliance, the applicant shall be notified of the corrective actions necessary and shall have at least thirty (30) days to take such actions prior to initiation of enforcement proceedings.

(g) RECLAIMED WATER RATE: The rate charged for reclaimed water shall be established by resolution of the City.

SEC. 64.0808 IMPLEMENTATION PROGRAM

(a) RULES AND REGULATIONS. The City Manager shall establish general rules and regulations governing the use and distribution of reclaimed water.

(b) PUBLIC AWARENESS PROGRAM. The City Manager shall establish a comprehensive water reclamation public awareness program.

(c) COORDINATION AMONG AGENCIES. The City Manager shall coordinate efforts between the City and other regional agencies to share in the production and utilization of reclaimed water, where the potential exist.

(d) FINANCING PROGRAMS. The City Manager may, through the Master Plan, or other program, identify resources, and adopt measures to assist water users in the financing of necessary conversions mandated by this ordinance.

SEC. 64.0809 REGULATIONS OF WASTE DISCHARGE TO SEWAGE SYSTEMS

(a) INTENT: The City recognizes that to maintain adequate wastewater quality for water reclamation treatment processes, and to protect public and private property, restrictions may be required on certain industrial, commercial and residential waste discharges to a sewerage system that is located within a designated tributary area of an existing or planned reclamation facility.

(b) ADOPTED TRIBUTARY PROTECTION MEASURES: Waste discharges to the sewage system from any industrial, commercial or residential source may be restricted or

prohibited by ordinance upon a finding, following a noticed public hearing, that the type or class of discharge involved is capable of causing or may cause substantial damage or harm to any sewage treatment or reclamation facility or to any significant user or users or potential user or users of reclaimed water within an area which has been planned for reclaimed water service. (Municipal Code section 64.0514)

SEC. 64.0810 VALIDITY

If any provision of this ordinance or the application thereof to any person or circumstance is held invalid, the remainder of the ordinance and the application of such provisions to other persons or circumstances shall not be affected thereby.

Section 2. This ordinance shall take effect and be in force on the thirtieth day from and after its passage.

APPROVED: JOHN W. WITT, City Attorney
By
Rudolf Hradecky
Deputy City Attorney
RH:mb
06/16/89
06/26/89 COR.COPY
Or.Dept:W.Util
O-89-241
Form=o.none

APPENDIX O

(R-2003-527) Cor. Copy 2
12-9-02

RESOLUTION NUMBER R-297487

ADOPTED ON DEC 0 9 2002

WHEREAS, The City of San Diego's strategic reclaimed water objective is to increase the number of customers using reclaimed rather than potable water; and

WHEREAS, on July 24, 1989, the City Council adopted Ordinance O-17327 (N.S.) known as the Mandatory Reuse Ordinance, San Diego Municipal Code section 64.0801 et. seq., which authorized the City Manager to make preliminary determinations on the conversion of potable water customers to reclaimed water, condition development projects to use reclaimed water, and require reclaimed water facilities as a condition for approval of building permits; and

WHEREAS, San Diego Municipal Code section 112.0201 provides that the City Council shall establish by resolution a schedule of fees and deposits for processing applications for development in the City; and

WHEREAS, it is necessary to establish a plan check fee to recover the cost of City staff plan review; and

WHEREAS, notice of the intention to establish the plan check fee has been given in accordance with Government Code section 66018;

NOW, THEREFORE, BE IT RESOLVED,

1. The City Manager is hereby authorized, in conjunction with the Public Utilities Advisory Commission, to develop criteria and procedures to enforce the Reclaimed Water Mandatory Reuse Ordinance, San Diego Municipal Code section 64.0801 et. seq., of Division 8: Water Reclamation and Ocean Monitoring, of Article 4: Sewers;

2. The City Manager is hereby authorized to proceed with recommendations to modify the Land Development Code process to allow the reclaimed water to become part of the Land Development Code; and

3. City Council hereby approves a Commercial Tenant Improvement Plan Review Fee of $400 for over-the-counter reclaimed water plan checks and a Fee for Service deposit of $2,400 for projects requiring the plan submittal for review, both effective February 15, 2003.

APPROVED: CASEY GWINN, City Attorney

By _____
Catherine Bradley
Deputy City Attorney

CB:cbs
10/08/02
10/29/02 Cor. Copy
12/9/02 Cor. Copy 2
Or. Dept: Water
R-2003-527

CIP-14-03-006

REQUEST FOR COUNCIL ACTION
CITY OF SAN DIEGO

1. CERTIFICATE NUMBER: N/A

CITY ATTORNEY	2. FROM: (ORIGINATING DEPARTMENT) Water Department/Water Policy, CIP Finance & Planning	3. DATE August 15, 2002

CT: laimed Water Business Plan

DCN: 2002-400111 X

FORMATION, CONTACT: (NAME & MAIL STA.)	6. Telephone No.	7. CHECK HERE IF BOX 1472A, "DOCKET SUPPORTING INFORMATION," HAS
si Steirer, MS 907/Surraya Rashid	533-4112/533-5306	X

COMPLETE FOR ACCOUNTING PURPOSES

	41500			
ATION				
ACCOUNT				
ER				

FINAL APPROVED COPY with Resolution or Document # R-297487

9. ADDITIONAL INFORMATION / ESTIMATED COST:

See accompanying City Manager's Report

CIVIL DIVISION 02 OCT -7 PM 3:1 CITY ATTORNEY

ROUTING AND APPROVALS

APPROVING AUTHORITY	APPROVAL SIGNATURE	DATE SIGNED	ROUTE (#)	APPROVING AUTHORITY	APPROVAL SIGNATURE	DATE SIGNED
DEPARTMENT DIRECTOR		9/11/02	6	CITY MANAGER		10/04/02
DSD		9/19/02	7	AUDITOR		10/7/02
EAS		9/19/02	8	CITY ATTORNEY		10/8/02
FM		9/25/02	9	ORIGINATING DEPARTMENT	Richard W Cadin	10/8/02
EOC		9/30/02	✓	MGR. DOCKET COORD.	10/8/02	COUNCIL REP.
				RULES COMMITTEE	☐ CONSENT ☐ ADOPTION ☐ Refer to ____ Date ____	

ARATION OF: ☒ RESOLUTION(S) ☐ ORDINANCE(S) ☐ AGREEMENT(S) ☐ DEED(S)

horizing the City Manager, in conjunction with the Public Utilities Advisory Commission, to develop criteria and lures to enforce the Reclaimed Water Mandatory Reuse Ordinance, San Diego Municipal Code Section 64.0801 . Of Division 8: Water Reclamation and Ocean Monitoring, of Article 4: Sewers;

(Continued on the other side)

AGER'S RECOMMENDATIONS: Adopt the proposed resolutions.

AL CONDITIONS (REFER TO A.R. 3.20 FOR INFORMATION ON COMPLETING THIS SECTION.)

CIL DISTRICT(S): All

IUNITY AREA(S): All

CLERK INSTRUCTIONS: Send two copies of Resolutions and one copy of the adopted 1472 to Water Department, Irma Holt, 533-5198, MS 910.

ONMENTAL IMPACT: This activity is not a "project" and therefore is exempt from CEQA pursuant to State CEQA Guidelines Section 15060(c)(3).

DOCKET SUPPORTING INFORMATION

CITY OF SAN DIEGO

DATE: August 15, 2002

SUBJECT: Reclaimed Water Business Plan

BACKGROUND:

City's strategic reclaimed water objective is to increase the number of customers using reclaimed rather than potable water. This will enable the City to beneficially utilize reclaimed water plant production capacity to the greatest extent possible and provide a reliable alternative water source to non-potable customers. The Reclaimed Water Business Plan builds on previous City Council actions to further this objective.

On July 24, 1989, the City Council adopted Ordinance 0-17327N.S., known as the Mandatory Reuse Ordinance. This Ordinance authorized the City Manager to make preliminary determinations on the conversion of potable water customers to reclaimed water, condition development projects to use reclaimed water, and require reclaimed water facilities as a condition for approval of building permits. The Mandatory Reuse Ordinance establishes the policy that reclaimed water shall be used within its jurisdiction wherever feasible, and consistent with legal requirements, preservation of the public health, safety and welfare, and the environment.

Other actions to further the beneficial use of reclaimed water included: preparation of a the Beneficial Reuse Study (BRS) which identified the most cost-effective use of reclaimed water; development of a long-term capital program based on the findings of the Reclaimed Water Master Plan (an update to the Beneficial Reuse Study); and reduction of reclaimed water rates from $580/Acre-Foot (AF) or $1.34/Hundred Cubic Feet (HCF) to $350/AF or $0.80/HCF.

The attached Manager's Report details an on-going strategy, as well as identifies an internal City process to implement the Reclaimed Water Business Plan in a customer friendly and efficient manner. The reclaimed water strategy that the Water Department is pursuing, as detailed in the BRS, is to connect large, single-meter customers to the system in order to develop the most cost effective non-potable reclaimed water distribution system.

.ee actions are requested. The first is for the Water Department to work with the Public Utilities Advisory Commission to develop procedures to enforce a provision in the Mandatory Reuse Ordinance requiring existing potable water customers to convert to use reclaimed water. The second action is to modify the Land Development Code (LDC) to include reclaimed water. The LDC has established rules and regulations regarding the use of the land development process to extend water and wastewater facilities within the City of San Diego but does not currently include reclaimed water facilities. The third action will establish plan check fees to recover the cost of City staff plan review. Staff recommends a Commercial Tenant Improvement Plan Review Fee of $400 for over-the-counter reclaimed water plan checks and a Fee for Service deposit of $2,400 for projects requiring plan submittal for review. Similar fees are currently being used for cost recovery on water and wastewater plan reviews. These fees would become effective January 27, 2003.

On July 17, 2002, the Natural Resources and Culture Committee reviewed and gave tentative approval to the Reclaimed Water Business Plan.

A more detailed description of the Reclaimed Water Business Plan can be found in the attached Manager's Report.

FISCAL IMPACT: None. Additional costs to implement this action will be reimbursed through building permit plan check fees.

BY LINE: (CITY MANAGER/DEPT. HEAD/ AUTHOR INITIALS)

(MENDES/GARDNER/MS)

SIGNATURES:

ORIGINATING DEPT. HEAD

CITY MANAGER
(FOR MANAGERIAL DEPARTMENTS ONLY)

APPENDIX P

THE CITY OF SAN DIEGO

MANAGER'S REPORT

DATE ISSUED: July 28, 2004 REPORT NO. 04-172

ATTENTION: Natural Resources and Culture Committee
Agenda of August 4, 2004

SUBJECT: Recycled Water Mandatory Reuse Ordinance Criteria

REFERENCE: City Council Ordinance O-17327 – Mandatory Reuse Ordinance
City Council Resolution R-297487
City Manager's Report 04-084

SUMMARY

Issues –

1. Should the Natural Resources and Culture (NRC) Committee approve the recommended criteria specifying under what conditions new and existing properties shall be required to use recycled water for landscape irrigation, sanitary plumbing, HVAC cooling tower, and manufacturing uses?

2. Should the NRC Committee support the recommendation to implement a focused Customer Development Program aimed at increasing public awareness of recycled water issues, increasing the conversion of existing potable water customers to recycled water use, and providing new recycled water customers improved customer care coordination for the plan review and approval process?

Manager's Recommendations –

1. Approve the recommended criteria specifying under what conditions new and existing properties shall be required to use recycled water for landscape irrigation, sanitary plumbing, HVAC cooling tower, and manufacturing uses.

2. Approve the recommendation to implement a focused Customer Development Program aimed at increasing public awareness of recycled water issues,

increasing the conversion of existing potable water customers to recycled water use, and providing new recycled water customers improved customer care coordination for the plan review and approval process.

Fiscal Impact –

Implementing the Customer Development Program will require the expenditure of up to $80,000 in FY 2005. These expenditures will be absorbed through the reallocation within the Water Department of FY 2005 budgeted amounts for professional contractual services.

BACKGROUND

On July 24, 1989 the San Diego City Council approved Ordinance 0-17327 ("Mandatory Reuse Ordinance") which specified that "recycled water shall be used within the City where feasible and consistent with the legal requirements, preservation of public health, safety and welfare, and the environment." On December 9, 2002 San Diego City Council passed Resolution R-297487 authorizing City staff to work in conjunction with the Public Utilities Advisory Commission (PUAC) to develop specific criteria to be applied in determining which particular properties would be required to use recycled water for suitable and approved purposes.

In order to develop specific reuse criteria for both new development and "retrofit" situations, City staff met with the PUAC Subcommittee on Water & Wastewater Service Delivery in early 2003. As a result, an initial draft of proposed criteria was developed which balanced the following elements in determining specific properties and facilities that would be required to use recycled water:

1. type of approved use (e.g. landscape irrigation, sanitary purpose, etc.)
2. proximity of the property to existing recycled water pipelines
3. construction costs; and
4. the amount of potable water savings anticipated as a result of conversion to recycled water use.

In general, the draft criteria mandated customers whose existing developed property was immediately adjacent to a recycled water pipeline, and which used 5 acre feet per year (AFY) or more of potable water for landscape irrigation purposes, be required to retrofit their property to use recycled water for this purpose. For all "new" property in development adjacent to an existing pipeline, the draft criteria required recycled water use for irrigation purposes regardless of amount of projected consumption. In addition, the draft criteria recommended that all new buildings and facilities be required to use recycled water for cooling tower and sanitary uses if the property was immediately adjacent to the pipeline and if specific building size or water consumption thresholds were met.

Subsequently, staff made presentations to community groups and other interested parties to collect input and feedback on the initial draft criteria, as well as to identify preliminary concerns regarding their application. (See Attachment 1: Community Presentations.) Based upon input

obtained during these presentations throughout 2003, the initial draft criteria was revised and presented to the PUAC for approval on November 17, 2003.

The primary change to the criteria resulting from stakeholder feedback was the increase in the usage threshold for retrofit properties. Based upon concerns expressed from the business community, including building managers, regarding the impact of significant upfront retrofit construction cost (estimated at $2000 per acre foot of consumption), the usage threshold was raised from 5 AFY to 20 AFY to provide for a 4-5 year payback more consistent with the business planning cycle; based upon the current price difference between potable and recycled water, the average retrofit customer using 20 AFY could expect a payback of their construction costs within 4 - 5 years.

DISCUSSION

Since the November 2003 PUAC approval of the revised criteria, staff has continued to make additional follow-up presentations to targeted stakeholders in response to their continuing concerns regarding the impact of the criteria on specific businesses and operations, and to identify any further mitigation for these concerns. Staff again met with representatives of Building Owners and Managers Association (BOMA), the San Diego Regional Chamber of Commerce, the Industrial Environmental Association (IEA) as well as the San Diego Regional Economic Development Corporation (SDREDC). In addition, staff met with recycled water program staff of Irvine Ranch Water District in order to evaluate alternative approaches and experiences regarding the implementation of reuse requirements.

Representatives from BOMA, SDREDC, and SD Regional Chamber of Commerce expressed a concern regarding the economic impact of the proposed requirement that new buildings over 55 feet in height be dual plumbed to accept recycled water for sanitary uses (toilet and urinal flushing). Key among their concerns has been the incremental additional construction costs which would be expended to plumb a building of this size for both potable water and recycled water. Representatives estimated the additional costs at approximately $650 per fixture. A building of this size would have on average 46 fixtures, resulting in total additional construction costs of $29,900.

In response to these concerns, staff met with members of Irvine Ranch to more fully explore the cost impact of dual plumbing requirements. Based upon data obtained from this agency, which has successfully implemented dual plumbing in 13 office buildings to date based upon the same criteria being proposed by the City, expected incremental construction costs would be 9% of total plumbing costs. For construction costs typically experienced in a building of the size falling within the criteria, ($8 million), incremental costs would be less than 1% of total construction costs. As a result, staff continues to recommend that new buildings over 55 feet in height or having an occupancy of 800 people or more be required to dual plumb for recycled water as a condition of development. In addition, in response to the practical experience of Irvine Ranch regarding the application of these criteria and to further clarify building size, staff is recommending that criteria also include buildings over 80,000 square feet. A minimum potable water savings of 1-3 AFY per building is expected as a result of this requirement.

BOMA, SDREDC, and SD Regional Chamber of Commerce have also suggested modification of the department's proposed criteria regarding the use of recycled water for manufacturing purposes. Staff initially proposed that all manufacturing process which utilized 5 AFY in potable water be mandated to use recycled water if such usage level would result in a business payback of 5 years or less. Concerns of the above stakeholders centered on the technical expertise that would be required of staff in order to effectively evaluate the cost differentials and payback associated with potentially detailed and complex manufacturing processes. In order to effectively implement the proposed criteria, these stakeholders observed that the level of technical review required could be very significant. While firmly agreeing that all manufacturing should actively evaluate the suitability of recycled water use, these stakeholders have proposed that such evaluation be done in partnership with the City's Recycled Water Program, rather than through a mandated conversion process. Given the limited number of potential customers which would likely fall into this usage category, and given the concerns expressed, staff altered its initial recommendation to specify that manufacturing facilities be required, as a condition of development, to submit a recycled water use study to the City detailing the degree of feasibility associated with recycled water use. Staff within the Recycled Water Program will review such use study and work in partnership with manufacturing facilities to maximize recycled water use.

In meeting with additional stakeholders, the Industrial Environmental Association (IEA) expressed to staff concerns regarding the feasibility of using recycled water for cooling tower purposes. In response, staff contracted with *Earth Tech,* a private firm specializing in this area, to complete an in-depth analysis which addressed both the health and safety concerns of recycled water usage for cooling towers, as well as identified the impact of its use on the overall maintenance costs of these units. The report found that there were no health impacts to the use of recycled water for cooling towers. In addition the study concluded that while operational and maintenance procedures would have to change, the resultant incremental additional costs associated with any changes would be offset by the lower cost of recycled water vis-à-vis potable water. The conclusions of this report were shared with members of the IEA at a special recycled water workshop held at the North City Water Reclamation Plant on May 27, 2004. As a result, staff continues to recommend the previous criteria requiring all new buildings utilizing 300 tons of cooling or greater be required to use recycled water for such purposes. It is expected that 5 AFY in potable water savings per facility would result from implementing this criteria.

In response to concerns expressed by the San Diego Chamber of Commerce regarding the impact of irrigation retrofit costs on individual customers, the department continued research into potential financial mechanisms that could be made available to private property owners who were required to retrofit. In addition to previous examinations into private loan financing, potential revolving funds, potential financial support from both the Metropolitan Water District and County Water Authority, and submissions for Proposition 13 and Proposition 50 funds, this research effort also included discussions with *Johnson Controls*, a private engineering firm, regarding the feasibility of utilizing a "performance contracting" model as means by which retrofits installations could be accomplished without the burden of up-front capital costs on the customer.

Unfortunately, despite these efforts, the Department has not been successful in the identification of a viable funding source in support of property owner retrofit costs. Prop 13 and 50 efforts

requesting support of a revolving loan program have been unsuccessful. Both MWD and CWA have been unable to provide incentives in support of private property construction. A review of third party lending options revealed that the potential loan pool would be too small for lenders to independently create incentives for retrofit customers. And the potential performance contracting model proposed by *Johnson Controls* was not feasible as that company was not in a position to assume the financial risk of loaning money directly to retrofit customers. The Water Department itself could not assume this risk as the City Charter prohibits the extension of credit to property owners in this manner.

However, staff is recommending the establishment of a 20 AFY usage threshold which would trigger mandatory retrofit notwithstanding the inability to identify financial incentives for property owners. This threshold was previously approved by the PUAC (and recently reaffirmed at its July 19, 2004, meeting) in recognition of the feedback obtained from stakeholders regarding the need to establish a reasonable payback period of retrofit costs; recognition that this consumption level represents a significant amount of potable water use (6.5 million gallons annually) for landscaping purposes; and represents the best balance between business constraints and the need to maximize the use of recycled water where available and feasible.

Finally, while developing criteria for mandatory reuse, program staff also undertook a customer development analysis to identify how the Recycled Water Program can effectively coordinate the customer contact associated with any mandated program as well as increase the level of outreach to potential customers who do not fall within the mandatory criteria. The result of this analysis is a series of recommendations regarding improved public education and communication, as well as targeted customer management. While the analysis identify many potential initiatives, staff review of these in the context of overall Recycled Water Program goals resulting in a recommendation to implement the following for Fiscal Year 2005:

1. Create an informational program targeted to customers who will be mandated to use recycled water.
2. Implement a prospect nurturing program to boost prospect-to-customer conversion rate.
3. Develop a public awareness program for the area served by the North City Water Reclamation Plant that is integrated with the County Water Authority's region-wide approach.

RECOMMENDATION

As a result of the above research and outreach efforts, staff is recommending the NRC approve the criteria outlined in Attachment 2 for enforcing the mandatory use requirements on properties immediately adjacent to an existing recycled water distribution pipeline.

Staff is also requesting NRC approval of no more than $80,000 in Fiscal Year 2005 for the acquisition of contractual resources necessary to implement the primary recommendations resulting from the customer development plan completed.

These recommendations were reviewed and approved by the PUAC at its June 21, 2004, and July 19, 2004, meetings.

ALTERNATIVES

1. Approve criteria which mandates the use of recycled water for new development only.
2. Approve alternate criteria.
3. Do not approve the acquistion of resouces in support of the Customer Development Plan.

Respectifully submitted,

Frank Belock, Jr.
Water Department Director

Approved: Richard Mendes
Deputy City Manager

BELOCK/AR

Attachment: 1. Community Presentations
2. Proposed Criteria

ATTACHMENT 1

COMMUNITY PRESENTATIONS

During the period between March and July 2003, presentations regarding the initially proposed criteria for recycled water mandatory use were made to the following groups:

- Associated General Contractors (AGC)
- BIOCOM
- Building Industry Association (BIA)
- Building Owners and Managers Association (BOMA)
- California Landscape Contractors Association (CLCA)
- Community Planning Groups:
  - Rancho Bernardo
  - University
  - Miramar Ranch North
  - Mira Mesa
  - Otay Mesa
  - Scripps Ranch

- Industrial Environmental Association (IEA)
- Metro TAC
- Metro Commission
- Public Utilities Advisory Commission
- San Diego City Schools Landscape and Maintenance
- San Diego Greater Area Chamber of Commerce
- San Diego Regional Economic Development Corporation
- Sierra Club
- Technical Advisory Committee to City of San Diego DSD
- WaterReuse Association – San Diego Regional Chapter

Recycled Water Mandatory Use in San Diego
Retrofit Market

Title 22 Uses of 2.2 Disinfected Tertiary Recycled Water	Retrofit Market (Where property line is contiguous to RW line [1])				
	Residential		Schools, Commercial, Industrial, Governmental	Parks and Cemeteries	Golf Courses
	Single Family Dwelling	Multi-Family/HOA			
Irrigation	Not Required	**Required if = or > 20 AFY usage for irrigation**	**Required if = or > 20 AFY usage for irrigation**	**Required**	**Required**
Dual Plumbing – Sanitary Uses	Not allowed per Title 22	Not allowed per Title 22	Not required. Voluntary	Not Required	Not Required
HVAC – Cooling Tower	Not Applicable	Not Required	Not required. Voluntary	Not Applicable	Not Applicable
Manufacturing Processes [2]	Not Applicable	Not Applicable	Not required. Voluntary	Not Applicable	Not Applicable
Other Uses [3]	**May be required, on a case-by-case basis.**				

[1] Proposed retrofit criteria are in effect when a pipeline capable of serving recycled water is contiguous to the customer's property or will be contiguous within one year.

[2] For manufacturing that uses potable water as part of manufacturing process.

[3] Refer to Title 22 Water Recycling Criteria in California (cost recovery of < or = 5 years will be used).

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ATTACHMENT 2

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Recycled Water Mandatory Use in San Diego
New Development Market

Title 22 Uses of 2.2 Disinfected Tertiary Recycled Water	New Development Market [3]				
	Residential		Schools, Commercial, Industrial, Governmental	Parks and Cemeteries	Golf Courses
	Single Family Dwelling	Multi-Family/HOA			
Irrigation	Not Required	**Required**	**Required**	**Required**	**Required** [1]
Dual Plumbing – Sanitary Uses	Not allowed per Title 22	Not allowed per Title 22	**Required, if recycled water is available or will be available based on City of San Diego current Master Plan and building is 55 ft in height, projected to have at least 800 occupants, or encompasses 80k sq.ft.**	Not Required	Not Required
HVAC – Cooling Tower	Not Applicable	Not Required	**Required if > or = 300 Tons capacity or 5 AFY recycled water usage.**	Not Applicable	Not Applicable
Manufacturing Processes [1]	Not Applicable	Not Applicable	Recycled Water Use Study submitted as a condition of development.	Not Applicable	Not Applicable
Other Uses [2]	**May be required, on a case-by-case basis.**				

[1] For manufacturing that proposes to use potable water as part of manufacturing process

[2] Refer to Title 22 Water Recycling Criteria in California.

[3] New development projects are required to install recycled water facilities for approved uses within an existing or proposed reclaimed water service area in accordance with Subdivision Map Act and the City of San Diego Municipal Code.