

**SECTION 1  
INTRODUCTION**

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**Urban Water Management Plan Update Preparation**

**1.1**

This *Urban Water Management Plan* (UWMP) has been prepared in compliance with the Urban Water Management Planning Act of 1983, as amended.<sup>1</sup> It updates the 1995 UWMP prepared by the City of Huntington Beach under the terms of AB 797 (1983) and subsequent amending legislation.

The 2000 UWMP Update incorporates changes required by recent legislation including AB 1845 (1995) and SB 1011 (1995). The UWMP also incorporates water use efficiency efforts that the City has implemented or is considering implementing pursuant to the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU).<sup>2</sup> The City became signatory and adopted the MOU in August 2000.

***Agency Coordination***

The City Water Department Staff coordinated development of this plan with the City Administrator's Office, Public Works Department, Community Development Department, Economic Development Department, and City Clerk's Office. Development of the Plan was also coordinated with the Municipal Water District of Orange County (MWDOC), which serves as the City's wholesaler of water received from the Metropolitan Water District of Southern California (MWD); the Orange County Water District (OCWD), which manages the Santa Ana River groundwater basin; and the Orange County Sanitation District (OCSA), which manages wastewater. Appendix A lists the numerous references used benefiting development of this plan.

***Plan Adoption***

The 2000 UWMP was adopted by resolution of the Huntington Beach City Council on December 18, 2000, following a public hearing. The Plan was submitted to the California Department of Water Resources within 30 days of Council approval. Copies of the notice of public hearing and the Resolution of Plan Adoption are included in Appendix B. Copies of the Plan were made available to the public within 30 days after adoption. This Plan will be used by City staff to guide the City's water use efficiency efforts through the year 2005.

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<sup>1</sup>California Water Code, Division 6, Part 2.6; §10610, et. seq. Established by Assembly Bill 797 (1983).

<sup>2</sup>The *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU) was adopted in September 1991 by a large number of water suppliers, public advocacy organizations and other interested groups. It created the *California Urban Water Conservation Council* and established 16 Best Management Practices (BMPs) for urban water conservation, recently refined to 14 BMPs. The City of Huntington Beach adopted the MOU on August 21, 2000.

## **Water Service Area**

## **1.2**

### ***Location***

The City of Huntington Beach is located 35 miles southeast of Los Angeles and 90 miles northwest of San Diego along the Southern California coast of Orange County as shown in Figure 1.1. Huntington Beach has a land area of 28 square miles and a water area of 26 square miles. The City is generally flat, with elevations ranging from a low of about 5 feet below to 120 feet above sea level. The City is predominately residential, although it is also has nearly 500 major industrial businesses, 56 parks, and 8 ½ miles of beaches.

### ***Climate Characteristics***

The City of Huntington Beach is located in an area known as the South Coast Air Basin (SCAB). The SCAB climate is characterized by what is known as Southern California's "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall. The climate for Huntington Beach is consistent with coastal Southern California. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

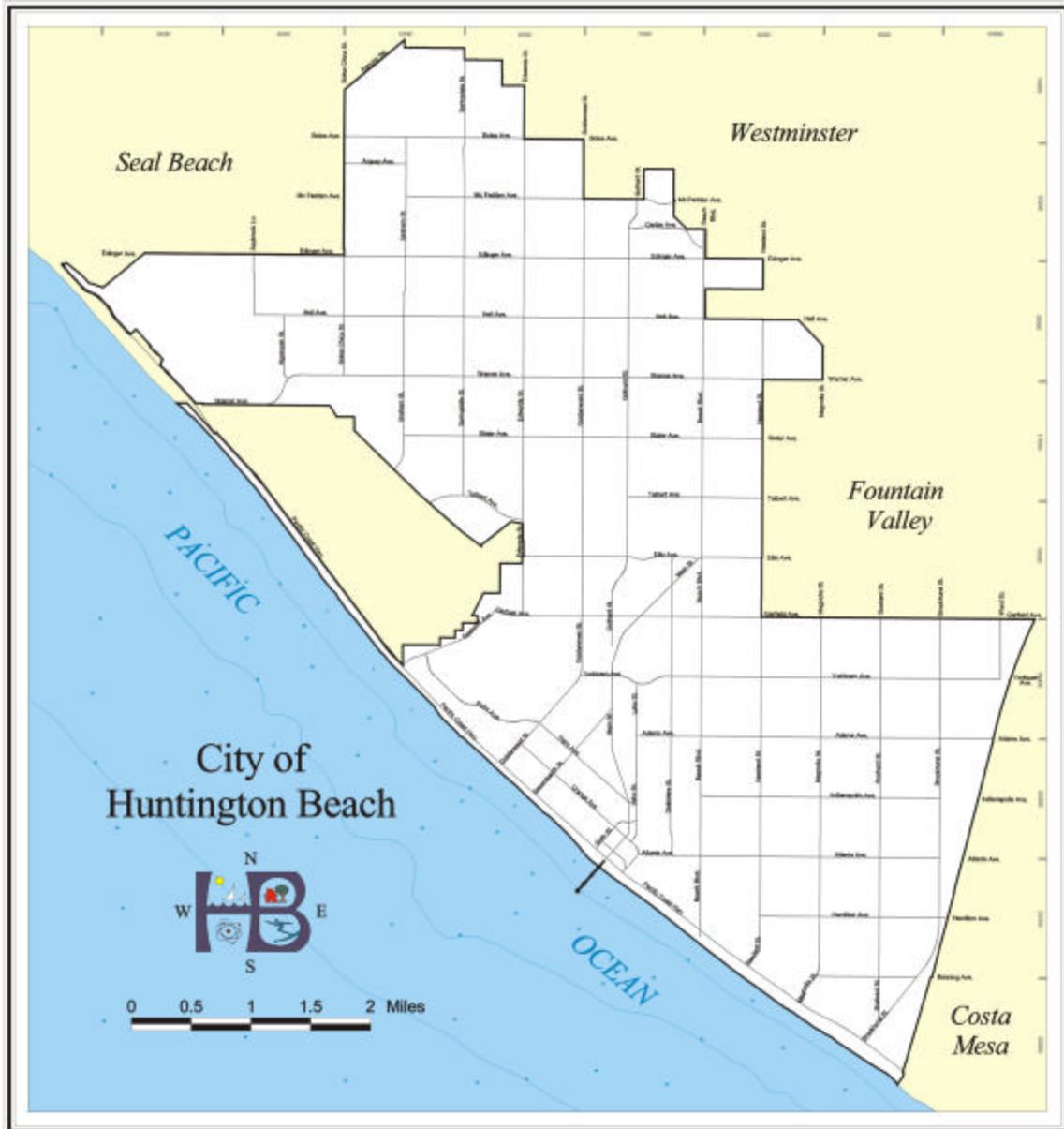
The average annual temperature varies throughout the Basin, averaging 62 degrees Fahrenheit at the coast where Huntington Beach is located. January is usually the coldest month while July and August are usually the hottest months of the year. Annual average relative humidity is 64.7 percent. Precipitation is typically 10 to 12 inches, occurring mostly between November and April.

### ***Demographics***

The population of Huntington Beach is currently estimated at nearly 208,000 people, and is growing slowly, as there is very little remaining vacant land. The Huntington Beach Water Division service area is predominantly residential with over 90 percent of water service connections serving single-family and multi-family residences. Approximately 65 percent of Huntington Beach residents live in single-family homes. The City also serves the Sunset Beach area of unincorporated Orange County.

Data presented by the Center for Demographic Research at California State University Fullerton projects very little change in Huntington Beach's population (2.0%) and dwelling units (3.0%), and minimal change in land use over the next 20 years. Table 1.1 shows the population projections in five-year increments to the year 2020.

**Figure 1.1**  
**City of Huntington Beach Location Area**



**Table 1.1**  
**City of Huntington Beach**  
**Population Projections**

	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Service Area Population</b>	207,642	210,734	212,181	211,558	211,581

Source: The Center for Demographic Research, California State University Fullerton.

## **Huntington Beach Water Division**

**1.3**

### ***Water Division***

Huntington Beach was incorporated as a city in 1909, is one of the oldest cities in Orange County, and is the third largest city in the County. It is a charter city, administered by a council/administrator government. From 1936 to 1964, the water system serving Huntington Beach was owned and operated by the Southern California Water Company. In 1964, the City purchased the private system and the City's Water Division was established as a Division of the Public Works Department. The Water Services Division is the principal water retailer within the City boundaries and the Sunset Beach area of unincorporated Orange County.

The Division is responsible for operating and maintaining wells, reservoirs, imported water connections, distribution pipelines, fire hydrants, water meters and related infrastructure, and for meter reading, billing and accounting services. The Division also conducts comprehensive water quality testing and monitoring programs and develops long range operational and engineering plans designed to prepare for future needs and contingencies.

Huntington Beach is 56.1% owner and acts as General Manager/Engineer for the West Orange County Water Board. The West Orange County Water Board is a joint powers agreement between the cities of Huntington Beach, Garden Grove, Westminster and Seal Beach for the ownership and operation of two large capacity imported water transmission lines (OC-9 and OC-35). The Water Division performs operation and maintenance of the lines.

The Water Division establishes an annual operation budget managed through the Water Fund. Water Fund revenues are received from monthly water use and connection fees billed to water customers. By ordinance, revenues and expenditures for the Water Fund must balance, and the annual Water Fund budget is developed consistent with this premise. The Water Fund annual budget includes programs for Engineering, Administration, Water Quality, Water Production, Water Maintenance and Water Meters. Personnel, operating and capital outlay / equipment replacement costs are determined for

each program. In addition, a capital projects budget is designed to address primarily replacements and upgrades of various water facilities and pipelines.

In 1995, the City Council adopted a Water Master Plan (WMP) and the accompanying Financial Plan. The WMP is designed to develop new water facilities, including new water storage and transmission facilities, to address the growth the City has experienced over the course of the last quarter century. To fund these improvements, a surcharge was established for water customers in December 1995. In addition, a capital facilities charge was instituted on all new residential development. Revenues from these charges are placed into the Water Master Plan Fund and used for capital improvements.

### ***Service Area***

The Water Services Division supplies customers throughout the City of Huntington Beach and the Sunset Beach area of unincorporated Orange County. Figure 1.2 shows the City limits and service areas, as well as the location of key water supply facilities, as described below.

### ***Water System Facilities***

Groundwater is pumped from 7 active wells located throughout the City. The age, depth, design flow and production data for the active wells, wells not in use, and one abandoned well is summarized in Section 2.

MWDOC wholesales imported water to the City from the Metropolitan Water District of Southern California (MWD). MWD treats water supplied to Huntington Beach at the Diemer Filtration Plant in northern Orange County. The Huntington Beach water distribution system is connected to MWD transmission mains at OC-9, OC-35 and OC-44 located respectively along the northeast, northwest and southeast sides of the City.

The City also operates three storage and distribution reservoirs with a combined capacity of 40.5 million gallons. The storage system is supported with three booster stations located at the reservoir sites. The booster pumps have a total capacity of 40,000 gallons per minute, which is adequate to keep the system pressurized under peak flow conditions.

**Figure 1.2**  
**Water Service Area and Supply Facilities**



**SECTION 2  
 WATER SOURCES AND SUPPLIES**

**Water Supplies**

**2.1**

The City of Huntington Beach receives 75 percent of its water supply from groundwater wells accessing the Santa Ana River groundwater basin and 25 percent from the Metropolitan Water District of Southern California (MWD) through the Municipal Water District of Orange County (MWDOC). These percentages reflect adjustments for in-lieu storage programs whereby the City, in cooperation with the Orange County Water District (OCWD) and other regional groundwater producers, receive import water in an effort to allow the groundwater basin to recharge. Actual percentages vary somewhat on an annual basis depending on to what extent these programs are implemented. Current and project water supplies are shown in Table 2.1

**Table 2.1  
 City of Huntington Beach  
 Current and Projected Water Supplies  
 acre-feet**

<b>Water Supply Sources</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
MWDOC – Import	9,365	9,550	10,000	10,000	10,000
Groundwater Production	28,095	28,250	29,675	29,700	29,700
Recycled Water		400	400	400	400
Total Water Supply	37,460	38,200	40,075	40,100	40,100

**Water Sources**

**2.2**

**Groundwater**

The Orange County groundwater basin underlies the north half of Orange County beneath broad lowlands. The basin covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, the Pacific Ocean to the southwest, and terminates at the Orange County line to the northwest, where its aquifer systems continue into the Central Basin of Los Angeles County. The aquifers comprising the Orange County groundwater basin extend over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits. In coastal and central portions of the basin, these deposits are more separated by extensive lower-permeability clay and silt deposits, known as aquitards. Groundwater supply meets approximately 60 percent of the water supply demand for all of Orange County, and 75 percent for north and central Orange County. In 1999, total basin production for all agencies was over 356,000 acre-feet.<sup>3</sup> The groundwater basin generally operates as a

<sup>3</sup>Orange County Water District, 1999-2000 Annual Report

reservoir in which the net amount of water stored is increased in wet years to allow for managed overdrafts in dry years. The basin is recharged primarily from local rainfall (greater in wet years), base flow from the Santa Ana River (much of which is actually recycled wastewater from treatment plants in Riverside and San Bernardino Counties), imported water percolated into the basin, and reclaimed wastewater directly recharged into the basin. The production capability of the basin is being increased as a result of a variety of specific management initiatives including increased wastewater reclamation and the blending of lower quality water with potable water for public distribution. It is anticipated that the aquifer will be cleaned over time by drawing out low quality water and replacing it with high-quality recharge water.<sup>4</sup>

In Huntington Beach, Groundwater is produced from seven operating wells that vary in depth from 250 feet to 1,020 feet, with production varying from 450 gallons per minute (gpm) to 4,000 gpm, with a total capacity of approximately 20,690 gpm. Table 2.2 lists the wells used for the City’s public water supply. Figure 2.1 shows the location of the wells used for the public water supply in Huntington Beach.

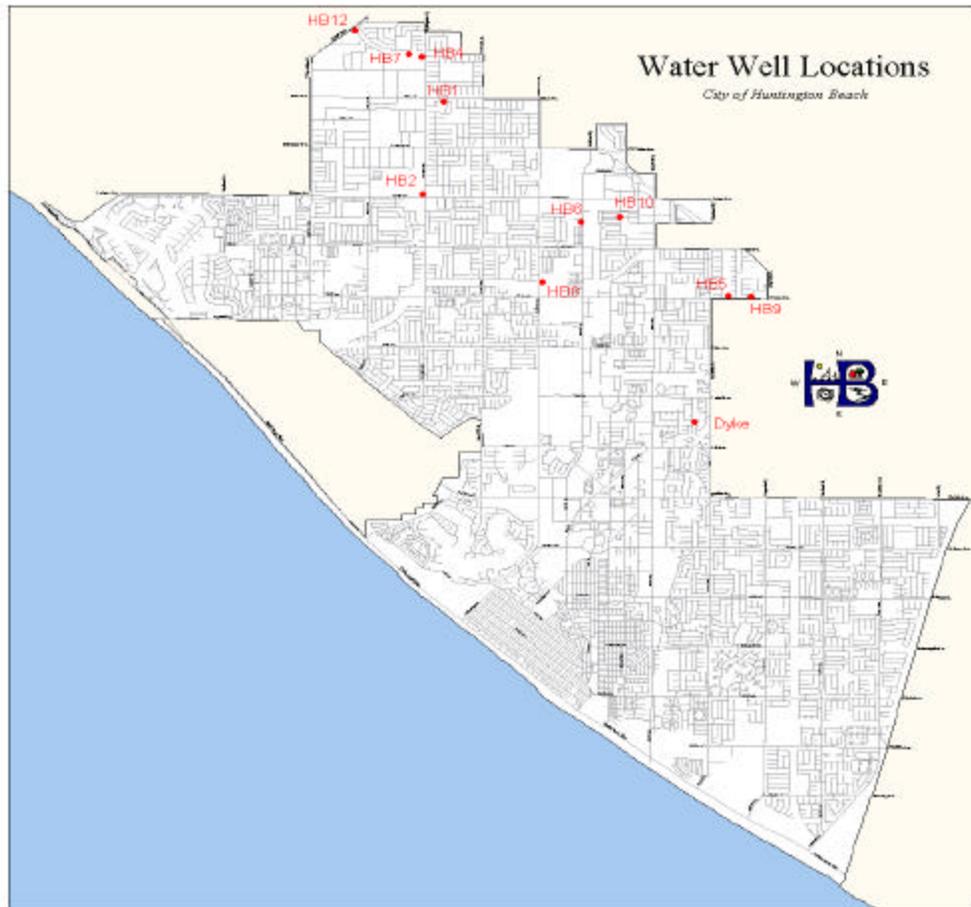
**Table 2.2  
 City of Huntington Beach Wells**

Well	Year Drilled	Well Depth (feet)	Operating Pump Speed (RPM)	Design Flow (GPM)
Dyke	1956	204	Inactive	Inactive
HB1	1962	306	1760	790
HB2	1962	820	1760	1500
HB3	1964	716	Abandoned	Abandoned
HB3A	1994	660	Under construction	
HB4	1967	804	1584	2890
HB5	1969	820	1666	2860
HB6	1973	810	1030	2730
HB7	1975	891	1108	3530
HB8	1978	724	Inactive	Inactive
HB9	1981	996	1648	2990
HB10	1981	960	1636	3400
HB11	1985	775	Abandoned	Abandoned
HB12	1996	807	Under development	

Although the City of Huntington Beach nominally receives 75 percent of its water supply from groundwater, the actual physical amount of groundwater introduced into the City’s water system averages 55 percent on an annual basis, with the difference between 55% and 75% being provided as imported water in lieu of groundwater under a special program by OCWD, MWDOC and MWD.

<sup>4</sup>Municipal Water District of Orange County, 2000 Regional Water Management Plan Update

**Figure 2.1**  
**City of Huntington Beach**  
**Water Well Locations**



OCWD sets a Basin Production Percentage (BPP) each water year. The BPP is based on groundwater conditions, availability of imported water supplies, and basin management objectives. The BPP is also a major factor in determining the cost of groundwater production from the basin for that year. The BPP has been set at 75 percent for the past

five years, including water year 2000/01. Groundwater production that is at or below the BPP pays the current \$107/af replenishment assessment. Producers may pump above the BPP to 100 percent of their needs by paying the Basin Equity Assessment (BEA). The BEA is the additional fee paid on any water above the BPP, making the cost of that water equal to the cost of imported water. Such flexibility guarantees Huntington Beach and other water utilities the ability to provide water to their customers during periods of varying water availability.

### **Imported Water**

Twenty-five percent of the City's water supply comes from import water wholesaled by MWDOC through MWD. Imported water is delivered from northern California via the State Water Project and the Colorado River. The City of Huntington Beach owns and operates

The City maintains three imported water connections to the MWD system. The characteristics of these connections are shown in Table 2.3. OC-9 is located at the intersection of Dale and Katella Streets in the City of STanton, and enters Huntington Beach at the intersection of Newland and Edinger Streets. OC-35 is located at the same intersection and enters Huntington Beach at the intersection of Springdale and Glenwood Streets. OC-9 and OC-35 are under the jurisdiction of the West Orange County Water Board. OC-44 is a meter located at the San Joaquin Reservoir, and flow is delivered to the City's service area through a 24- to 42-inch transmission main jointly owned by the City and Mesa Consolidated Water District. A secondary metering station, owned by the City is located on Adams Avenue at the Santa Ana River.

**Table 2.3**  
**Imported Water Connections**

<b>Designation</b>	<b>Capacity</b>
OC-9	6,300 gpm
OC-35	9,000 gpm
OC-44	6,700 gpm
<b>Total Capacity</b>	<b>22,000 gpm</b>

Source: Huntington Beach Water System Master Plan, 1988

### **Reservoirs**

The City maintains four potable water storage reservoirs with a total capacity of 40.5 million gallons. Overmyer Reservoirs #1, 2 and 3 are located Huntington and Garfield, and Peck Reservoir is located at Springdale and Glenwood. Locations of these facilities are shown in Figure 1.2. Pumps draw water from the reservoirs and pressurize it into the water system during high demand periods.

***Recycled Water***

The City has projected that by 2005, recycled water from OCWD's Green Acres Project will be available for irrigation use. Infrastructure is currently in place in anticipation of the expansion of the project into Huntington Beach. In addition, new development is required to install facilities for recycled water conveyance where appropriate. Section 8, Water Recycling, will discuss recycled water use and opportunities in greater detail.

**SECTION 3  
 WATER RELIABILITY PLANNING**

**Reliability of Water Supplies for Huntington Beach 3.1**

Huntington Beach and all of Orange County are experiencing increasing challenges as stewards of water resources in the region. The region faces a growing gap between its water requirements and its firm water supplies. Increased environmental regulations and the collaborative competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth in Orange County increase water demand within the region, putting an even larger burden on local supplies.

The City of Huntington Beach receives approximately 75 percent of its water supply from local groundwater, managed by the Orange County Water District (OCWD), and 25 percent from import water through the Municipal Water District of Orange County (MWDOC).

MWDOC and OCWD are implementing water supply alternative strategies for the region and on behalf of their member agencies to insure available water in the future. Strategies are identified in the MWDOC 2000 Regional UWMP and the OCWD 2000 Master Plan Report. The optimum water supply strategy should attempt to meet the following objectives:

- Insure that the groundwater basin is protected
- Insure that water is available for Orange County residents and businesses in the future
- Minimize the consumers water supply cost
- Use a variety of sources
- Reverse the adverse salt balance in the groundwater basin
- Provide flexibility to allow both MWDOC and OCWD to quickly take advantage of changing and new markets if and when they develop

**Reliability Comparison 3.2**

Table 3.1 compares current and project water supply and demand in average precipitation years. A sufficient amount of water is available to meet customer needs through 2020.

**Table 3.1  
 Projected Supply and Demand Comparison**  
 acre-feet

	2000	2005	2010	2015	2020
Supply	37,460	38,200	40,075	40,100	40,100
Demand	34,600	35,526	37,270	37,330	37,330
Difference	2,860	2,674	2,805	2,770	2,770

Source: MWDOC and City of Huntington Beach

Table 3.2 shows urban water demand in the Huntington Beach service area for an average or “normal” water year, a single dry water year, and multiple dry water years. Since 2000 was considered a drier than normal year, 1995/96 through 1998/99 were average to used a base normal year. According to MWDOC and MWD, data shows that Orange County’s semi-arid region, during periods of dry weather, would demand approximately 8 percent more urban water than in a “normal” weather year. Demand remains lower than supply reliability shown in Table 3.1.

**Table 3.2**  
**Supply Reliability – Demand Year 2000**  
 acre-feet

Average/Normal Water Year <sup>[1]</sup>	Single Dry Year		Multiple Dry Years	
	Factor	AF	Factor	AF
35,100	1.08	37,900	1.08	37,900

[1] Average year using MWDOC actual demand figures for 1994/95 through 1998/99

The Basin Pumping Percentage (BPP) established by OCWD described in Section 2 allows the flexibility to pump up to 75 percent of the City’s water demand. Thereby, guaranteeing the ability to provide water to the City’s customers during periods of varying water availability. Additional information is discussed in the Water Shortage Contingency Plan in Section 7.

OCWD has the authority to adjust the BPP annually based on groundwater conditions, availability of imported supplies, and basin management objectives. In any one dry year, OCWD would need to carefully manage its groundwater supply. In multiple dry years, OCWD may temporarily increase the BPP to reduce the dependence on MWD supplies. The groundwater basin would be drawn down assuming the seawater barrier was still effective. Following a drought, the BPP may be temporarily decreased for a few years to more rapidly increase basin storage levels. However, a constant BPP is more effective in managing water supply costs. The BPP has been constant for the past five years.

This analysis demonstrates that if imported water supply were to be reduced from a water supply shortage, then groundwater production could be expected to increase combined with water use efficiency measures to offset any reduction in imported water; thereby meeting demand.

**Vulnerability of Supply to Seasonal or Climatic Shortage 3.3**

Huntington Beach’s climate is a semi-arid environment with mild winters, warm summers and moderate rainfall, consistent with coastal Southern California. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The average annual temperature is 62 degrees Fahrenheit. Precipitation is typically 10-12 inches, occurring mostly between November and April.

Climatological data in California has been recorded since the year 1858. During the 20<sup>th</sup> century, California has experienced three periods of severe drought: 1928-34, 1976-77 and 1987-91. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by the Department of Water Resources (DWR). These rivers flow into the San Francisco Bay Delta and are the source of water for the State Water Project.

Southern California and, in particular, Orange County sustained few adverse impacts from the 1976-77 drought, due in large part to the availability of Colorado River water and groundwater stored in the Santa Ana basin. But the 1987-91 drought created considerably more concern for Southern California and Orange County.

As a result, Huntington Beach is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. Response to a future drought would follow the water use efficiency mandates of MWDOC and its support of the MWD WSDM Plan, along with implementation of the City's Water Shortage Contingency Plan.

### **Alternative Water Sources or Demand Management Measures 3.4**

The City of Huntington Beach projects that water demand in the City could increase as much as seven percent by the year 2020. Water use efficiency measures described in Section 5 of this plan have the potential to reduce overall demand.

Theoretically, the City of Huntington Beach could purchase all the water it needs to serve its customers from MWD through MWDOC if additional import capacity were available. New water supply sources will be developed primarily to better manage the Santa Ana Groundwater Basin resource and to replace or upgrade inefficient wells, rather than to support population growth and new development. Nevertheless, some water source alternatives are discussed in the following paragraphs.

#### ***Management of Water System Pressures and Peak Demands***

The City's distribution system pressures are managed to ensure that water pressure is within acceptable ranges for both domestic use and fire flow demands. Peak demands can be met with water from storage tanks.

#### ***Exchange or Transfer Opportunities***

The City of Huntington Beach maintains three connections to the MWD system and four emergency inter-city connections with surrounding communities. In aggregate, these connections have the ability to transfer well over 22,000 gpm into the City distribution system. The MWD connections are typically operating as constant flow sources.

Huntington Beach is 56.1 percent owner and acts as General Manager/Engineer and performs operations and maintenance for the West Orange County Water Board. The WOCWB is a joint powers agreement between the cities of Huntington Beach, Garden Grove, Westminster and Seal Beach for the ownership and operation of two large capacity import water transmission lines (OC-9 and OC-35). Huntington Beach is also

physically connected to a water transmission main operated by the Mesa Consolidated Water District system via OC-44. OCWD has proposed the West Orange County Wellfield Project, which would shift pumping away from the coastal areas where seawater intrusion, colored water and low well levels are ongoing concerns. If developed, the project proposes to use WOCWB lines to transmit groundwater produced in the Cypress/Stanton area of Orange County to coastal cities.

### **Conjunctive Use Programs**

Sufficient water storage programs will help to ensure adequate water supplies in the future and time of drought. With Southern California's and the Orange County region dependence on imported water to serve water demands, the need for local storage intensifies. One of the most effective forms of storage in a highly dry and arid climate, is conjunctive use wherein water is stored under ground during wet periods and pumped out during dry or drought periods. The MWDOC 2000 Regional Urban Water Management Plan discusses a number of conjunctive use opportunities in Orange County, including the Groundwater Replenishment System, the East Orange County Wellfield Project, the West Orange County Wellfield Project, the MWD Conjunctive Use Storage Program, and the Basin Cleaning Vehicle. Although each of the projects will benefit the water reliability of Huntington Beach, one project that provides direct benefits is described below.

**MWD Conjunctive Storage Program** - MWD and the OCWD have proposed a conjunctive use project to fund approximately 7-10 wells strategically sited throughout the OCWD service area to extract approximately 20,000 af of pre-stored water during call periods. The number of wells constructed depends upon the amount of storage, well capacity, and a three-year extraction period. The MWD wells are constructed, maintained and connected to individual groundwater producer systems. Groundwater producers would be able to use the MWD/OCWD wells to provide backup pumping capacity for their water systems, but not to meet the OCWD Basin Pumping Percentage. The agreement is for 25 years, and the program may be cycled additional times depending upon future drought scenarios.

During dry years, the additional wells could reduce Huntington Beach's dependence on imported water and provide greater reliability. The cost of the alternative water supply would be equal to the full-service MWD rate. Additional benefits of the program include greater reliability and flexibility, and managing coastal water levels and water quality in the region to protect the groundwater basin.

### **Recycled Water Projects**

The Southern California region, from Ventura to San Diego, discharges over 1 billion gallons (1.1 million afy) of treated wastewater to the ocean each day. This is considered a reliable and drought-proof water source and could greatly reduce the areas' and City's reliance on imported water. As technological improvements continue to reduce treatment

cost, and as public perception and acceptance continue to improve, numerous reuse opportunities should develop.

It is projected that by 2005, recycled water from OCWD's Green Acres Project, which currently produces 3,000 afy, will be available to Huntington Beach for irrigation use. Infrastructure is currently in place in anticipation of the expansion of the project into Huntington Beach. OCWD's Green Acres Project has been operated since 1992 and typically supplies retail users such as parks, industry, golf courses, etc. These supplies are locally controlled and highly reliable.

In addition, new development in Huntington Beach is required to install facilities for recycled water conveyance where appropriate. Section 7, Water Recycling, will further discuss recycled water use and opportunities.

### ***Ocean Desalting***

At this time, ocean desalting is an expensive water supply source relative to the groundwater and imported water available to Huntington Beach. Communities such as Santa Barbara and Catalina Island have constructed desalting plants due to their inability to obtain other supplies. Desalting generally costs at least \$1,300/af. Technological improvements should lower this cost in the future, and the supply is 100 percent reliable and the product water is of excellent quality. Huntington Beach would consider participation in desalted water use in the future if the cost of water were comparable to that of groundwater or imported water.

OCWD conducted a study, *Seawater Desalination Concept Analysis*, in March 1999, to determine the relative cost-effectiveness of ocean desalting compared to other potential supplies. The study concluded that unit desalted water costs range from \$1,150 to \$1,550 per acre-foot. This continues to remain two to three times higher than the cost of imported water.

**SECTION 4  
WATER USE PROVISIONS**

**Past, Current and Projected Water Use Among Sectors**

**4.1**

Since 1990, new connections are being added at a rate of approximately one percent per year. Due to new plumbing efficiency standards, landscape guidelines, and other water use efficiency programs, water demand is projected to increase at a rate of less than one percent per year. Unaccounted for water losses are currently estimated at about seven percent of total production. Table 4.1 shows past, current and projected water use between 1990 and 2020.

**Table 4.1  
Past, Current and Projected Water Use by Sector  
Acre-feet**

	1990	1995	2000	2005	2010	2015	2020
Single Family Residential	15,685	14,864	16,662	17,109	17,949	18,000	18,000
Multi Family Residential	8,005	7,589	8,485	8,711	9,139	9,140	9,140
Commercial	5,888	5,633	6,096	6,260	6,567	6,570	6,570
Industrial	555	541	695	714	749	750	750
Institutional and Governmental	882	911	1,028	1,055	1,107	1,110	1,110
Landscape	1,155	1,147	1,634	1,677	1,759	1,760	1,760
Unaccounted for System Losses <sup>[1]</sup>	unknown	2,148	2,860	2,674	2,805	2,770	2,770
<b>Total Water Use</b>	32,170	32,833	37,460	38,200	40,075	40,100	40,100

Source: City of Huntington Beach

<sup>[1]</sup> Estimated at approximately 7.0%

Table 4.2 shows the past and projected number of water service customers by sector from 1995 through 2020.

**Table 4.2  
Number of Water Service Connections by Sector**

	1995	2000	2005	2010	2015	2020
Single Family Residential	40,933	42,714	43,100	43,531	43,966	44,000
Multi Family Residential	4,170	4,120	4,160	4,202	4,244	4,244
Commercial	2,471	2,359	2,383	2,406	2,430	2,430
Industrial	143	338	341	346	348	348
Institutional	509	538	541	547	552	552
Landscape/Recreation <sup>[1]</sup>	437	738	745	753	760	760
Agriculture	0	0	0	0	0	0
<b>Total Connections</b>	48,663	50,807	51,270	51,784	52,300	52,334

Source: City of Huntington Beach

<sup>[1]</sup> Includes recycled water

The MWDOC 2000 Regional Urban Water Management Plan, Section 2.3, identifies water use data by sector in Orange County utilizing the MWD-Main forecast modeling. Modeling was used to estimate water use by single family residential, multi-family residential, non-residential and system loss usage. Table 4.3 compares the percent of water use by sector between Huntington Beach and Orange County. The results demonstrate that Huntington Beach is slightly higher in residential water use and lower in non-residential water use than the County average. System water losses are slightly higher than the County average.

**Table 4.3**  
**Urban Water Use by Sector in Huntington Beach/Orange County**  
(percent - %)

	Single-Family		Multi-Family		Non-Residential		System Losses	
	Huntington Beach	Orange County						
1990	49	47	25	19	26	29	unknown	5
1995	45	48	23	18	25	29	7	5
2000	45	48	23	18	25	29	7	5
2005	45	49	23	17	25	30	7	5
2010	45	48	23	17	25	31	7	5
2015	45	47	23	17	25	31	7	5
2020	45	47	23	17	25	31	7	5

Source: Table 4.1 and MWDOC 2000 Regional Urban Water Management Plan, Table 2.4

## Per Capita M&I Water Demand

## 4.2

Average daily per capita municipal and industrial (M&I) water is a useful measure of the mean quantity of urban water use necessary to support urban water demand and an individual's proportionate share of the water consumed by supportive commercial, industrial and municipal land uses. Historically, per capita M&I consumption has tended to increase over time at a low annual rate of growth.

Significant variations in water demand can occur from year to year, season to season and one location to another. Differences in consumption rates are related to a number of causal factors, including weather, irrigation demands, temperatures, person-per-household ratio, industrial land use, implementation of water use efficiency measures, water efficient plumbing, economic growth or recession, and new development.

Uncertainty associated with future changes in these variables makes the prediction of future per capita consumption rates extremely difficult. Table 4.4 lists the annual use of M&I water, estimated population, and annual per capita consumption in Huntington Beach from 1990 to 2000. Rainfall is also shown during the same time period to demonstrate the correlation between dry years and water use consumption.

According to the MWDOC 2000 Regional Urban Water Management Plan, Section 2.2, the overall per capita consumption for Orange County in the late 1970's was approximately 200 gallons per capita per day (gpcd), declined to approximately 196 gpcd in the mid-1990's as a result of drought-related water use efficiency, and finally increased to 209 gpcd in 2000, the second of two dry years. Huntington Beach averaged only 156 gpcd in the mid-1990's and 161 gpcd in 2000; much lower than the Orange County average.

**Table 4.4**  
**M&I Water Use Per Capita and Rainfall**

<b>Fiscal Year Ending June</b>	<b>M&amp;I Water Usage<sup>[1]</sup> (afy)</b>	<b>Estimated Population<sup>[2]</sup> (millions)</b>	<b>Per Capita M&amp;I Water Use (gpcd)</b>	<b>Rainfall<sup>[3]</sup> (inches)</b>
1990	32,170	181,676	158	8.7
1991	35,241	182,884	172	11.3
1992	31,858	184,092	154	15.6
1993	33,595	185,300	162	24.1
1994	33,516	186,508	160	12.1
1995	32,883	187,719	156	24.8
1996	35,099	188,633	166	11.3
1997	36,287	189,755	171	13.5
1998	33,879	190,877	158	30.6
1999	36,155	192,000	168	7.6
2000	37,460	207,639	161	8.1

[1] Source: City of Huntington Beach and MWDOC Historical Data, November 2000

[2] Center for Demographic Research California State University Fullerton, 12/99

[3] MWDOC 2000 Regional Urban Water Management Plan

### **Land Use and Water Use Efficiency Impacts on Consumptive Use 4.3**

The majority of the City of Huntington Beach is zoned for residential use. Commercial uses are generally scattered throughout the City, partially in strip areas and partially in concentrated specific centers. Several hundred industrial uses are located in Huntington Beach, included with some of the largest: Boeing Space and Defense Systems, AES Power Plant and Calarum. An additional significant use category is open space, which primarily consists of public school properties. Currently, vacant area within the City is quite limited. Projected population increases are not related to the redevelopment of any specific area, but is instead indicative of a general density increase.

Housing density data for Huntington Beach, as determined by the Center for Demographics Research California State University Fullerton, is shown in Table 4.5.

**Table 4.5**  
**Existing Water System Service Area Housing Density**

<b>Category</b>	<b>Description</b>	<b>Number</b>	<b>Units per Acre</b>
Low Density Residential	Single family residences	49,074	6.75
High Density Residential	Multi-family units	31,244	11.11

Source: Center for Demographic Research California State University Fullerton

Another factor that is considered in future use patterns is water use efficiency. Based on voluntary conservation and City drought response programs. If a conservative approach is taken for water use efficiency, combined with the effect of population and land-use increase, the combined effect is an estimated increase of seven percent in demand by 2020 as shown in Table 4.1.

**SECTION 5**  
**WATER DEMAND MANAGEMENT MEASURES**

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**Introduction** **5.1**

On August 21, 2000, the City Council of Huntington Beach elected to become Signatory to the Memorandum of Understanding (MOU) Regarding Best Management Practices (BMPs) for Urban Water Conservation with the California Urban Water Conservation Council (CUWCC). The City was officially voted in as a member of the CUWCC at the September 21, 2000 plenary session of CUWCC. The Municipal Water District of Orange County (MWDOC) implements many of the BMPs on behalf of its member agencies, including the City of Huntington Beach. MWDOC's 2000 Regional Urban Water Management Plan should be referred to for a detailed discussion of each regional BMP program.

**Cost/Benefit Analysis** **5.2**

In order for the City to implement a BMP, the practice must be 1) within the City's legal power to do so, 2) within the City's financial power to do so, and 3) deemed cost effective to implement. A benefit to cost ratio can be determined by defining the costs as the direct costs of the program and the benefit as the avoided cost of the quantified water savings. The cost per acre-foot of water is calculated using the following formula:

$$\text{Cost per acre foot} = (RA + \text{pumping costs}) \times BPP + \text{Total MWD Treated Rate} \times (1 - BPP)$$

Where:

RA = Orange County Water District (OCWD) Replenishment Assessment

BPP = Basin Pumping Percentage established by OCWD

Total MWD Treated Rate = MWD Rate + all MWDOC and Readiness-to-Serve (RTS) charges

**Example Cost/Benefit Analysis** – The City initiates a pilot program for residential water audits. The cost per audit, including follow-up, is \$75.00. It is determined that an acre-foot of water is saved for every five audits performed or \$375.00.

The current RA is \$107/af, the City's pumping costs are \$40/af, the MWD Treated Rate is \$461, and the BPP is 75%, therefore:

$$(\$107 + \$40) \times 0.75 + \$461 \times 0.25 = \$215.50 \text{ per acre-foot of water}$$

The program cost (\$375/af) exceeds the benefit (\$215.50/af). In this example, the residential water audit program would be deemed not cost effective, and the City would claim exemption from this practice.

## **Demand Management Measures (BMPs)**

### **5.3**

As Signatory to the MOU, the City may submit a copy of the annual report to the CUWCC identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy requirements of subdivisions (f) and (g) of Section 10631 of the Act. However, since the City became signatory in August 2000, it is not yet required to submit an annual report, and has chosen to discuss each of the BMPs that apply to the City and the status of implementation.

As signatory to the Urban MOU, Huntington Beach has committed to use good-faith efforts to implement the 14 cost-effective BMPs. These 14 BMPs include technologies and methodologies that have been sufficiently documented in multiple demonstration projects that result in more efficient water use and conservation.

Huntington Beach works cooperatively with MWDOC for technical and financial support needed to facilitate meeting the terms of the Urban MOU. MWDOC's current Water Use Efficiency Program includes regional programs implemented on behalf of its member agencies following three basic goals:

1. Provide on-going water use efficiency program support for member agencies.
2. Assume the position of lead agency to implement water use efficiency programs that are more cost-effectively implemented on a regional basis rather than a local basis.
3. Secure outside funding from MWD's Conservation Credits Program, United States Bureau of Reclamation, and other sources.

MWDOC's Water Use Efficiency Programs are discussed in detail within Section 4 of the 2000 Regional Urban Water Management Plan. The following discusses implementation of the 14 BMPs by the City and MWDOC on behalf of the City.

### **BMP 1 – Residential Water Surveys**

Residential surveys in Huntington Beach have been done on an informal basis by customer request following a high water bill complaint or meter reading that indicated higher than normal usage. For fiscal year 2000/2001, a Water Use Efficiency Program has been included in the Water Fund budget. Funds will be used to implement a residential survey pilot program coordinated by MWDOC. If deemed cost-effective, the program would be expanded to meet the criteria of this BMP.

In 1997, MWDOC began participating with MWD in its financial assistance program for residential surveys. The program offers either an in-house managed program completed by City staff, or MWDOC would facilitate the process of hiring a vendor it would manage to implement the program.

## **BMP 2 – Residential Plumbing Retrofits**

MWDOC and MWD are currently conducting a countywide plumbing fixture saturation study. The study will measure, with 95 percent confidence, the actual level of saturation. This will be compared to the BMP requirement of 75 percent saturation (+/- 10%) to determine countywide compliance with the BMP. It has been estimated that the saturation of low-flow showerheads is approaching the BMP requirement of 75 percent. Active implementation by water agencies, natural replacement by customers and the 1992 plumbing codes have contributed to the meeting the BMP requirement.

MWDOC has tracked distribution and installation of low-flow showerheads, in coordination with the ultra-low-flush toilet (ULFT) program, and has determined that between 1995/96 and 1999/00, Huntington Beach has retrofitted approximately 3,600 showerheads. The City will continue to participate in the distribution of water efficient plumbing devices, although actions required by this BMP are included as part of BMP 14, Residential ULFT Replacement Program.

## **BMP 3 – Distribution System Water Audits, Leaks Detection and Repair**

A system leak detection was performed as part of the Water Master Plan in 1996/97. The City also maintains an emergency response program that aggressively repairs main breaks, hydrant leaks or breaks, and meter leaks. A team of water service workers is immediately formed to permanently repair main or hydrant breaks, and restore water service promptly. Both a proactive approach and an “inform and response” approach are utilized for water meter leaks. All meter leaks are investigated and repaired the same day, unless unable to do so, then next day service is performed.

The City’s unaccounted for water percentage is monitored on a monthly basis and has been at approximately 7 percent for the last three years. MWDOC assists its member agencies by tracking and comparing each of its member agency’s percent distribution system unaccounted for water. This is an informational effort designed to show agencies the volume and value of the water that is unaccounted for in the water systems.

The percent loss is compared to the cost effectiveness standard set by the American Water Works Association (AWWA). The current standard suggests that if a system percent unaccounted for exceeds 9 percent, a distribution system audit could be cost effective. Based on information provided to MWDOC by its member agencies, their systems, including Huntington Beach, are generally operating within the current AWWA standard. Since the Huntington Beach unaccounted-for water is approximately 7 percent, regular distribution system water audits may not be cost effective. However, the level of unaccounted-for water will continue to be regularly monitored and a system-wide survey of distribution facilities could be implemented if water losses were to rise appreciably.

BMP 3 may be implemented during the term of this Plan only if the level of unexplained water losses increase and, in the judgement of management, there is a likelihood that the benefits of a system-wide audit would exceed the costs of the survey.

#### **BMP 4 – Metering with Commodity Rates**

Huntington Beach requires meters for all new water connections and bills by volume of use. All water service connections in the City, with the exception of dedicated fire services, are metered.

Meters are read on a sixty-one day schedule. Customers are billed monthly on the basis of a commodity charge, a fixed customer charge and a capital surcharge. The most recent water rates set the commodity charge at \$1.0451 per ccf (1 ccf = 748 gallons). The customer charge is based on meter size (\$6.06 for a standard residential meter) and the capital surcharge is \$5.50 per month for each equivalent dwelling unit based on meter capacity. The customer charge and the capital surcharge increase by meter size.

#### **BMP 5 – Large Landscape Conservation Programs**

Huntington Beach participates in MWDOC's regional programs targeting landscape irrigation efficiency. MWDOC and MWD provide sponsorship and performance based funding for these programs to offset the cost to the customer. These programs include the Landscape Contractor Certification Program, the Computer Controlled Irrigation System Retrofit Projects, and the Protector Del Agua Irrigation Management Training.

These programs directly benefit Huntington Beach through landscape contractor activities in the City. Such activities include landscape irrigation budgets, green material management, computer controlled irrigation systems, and bilingual irrigation management training, including advanced irrigation schedule programming and plant identification to promote use of arid climate plantings. The MWDOC 2000 Regional UWMP details each of the ongoing programs.

The City has also instituted and enforces Water Efficient Landscape Requirements through Municipal Code Chapter 14.52, which establishes the following:

- 1) a structure of designing, installing, and maintaining water efficient landscapes in new projects,
- 2) provisions for water management practices and water waste prevention,
- 3) a long-range goal of water efficiency through proper planning and design and the use of technologically current equipment,
- 4) tools to provide an individualized landscape improvement to suit the needs of the owner and requirements of the City, and
- 5) standards for a finished landscape that is physically attractive, conserves water and is easy to maintain.

A copy of the Water Efficient Landscape Requirements ordinance is included as Appendix C. The City also participates with large landscape customers by providing billing history information on request.

### **BMP 6 – High-Efficiency Washing Machine Rebate Programs**

High-efficiency clothes washers (HECWs) are relatively new to the list of BMPs. In September 1997, the California Urban Water Conservation Council adopted BMP 6 for HEWCs. If a regional or municipal energy provider is offering a rebate program to promote the purchase of energy-efficient HECWs by its customers, then the water agencies serving those same customers are asked to join the energy program and offer a rebate based on the water savings.

MWDOC recently joined the HECW rebate program on behalf of its member agencies, with numerous Orange County customers participating, including Huntington Beach. The program joins Southern California Edison (SCE) and MWD to offer rebates for water savings. MWD has reported that as of June 2000, the number of rebates issued by all HECW rebated programs in MWD's service area totaled 15,500, with a contribution of \$640,000. MWD is working to provide an individual report on rebates for the MWDOC service area, which will include a report of Huntington Beach program participants.

The City will continue to support the program and include information on availability of the program to its customers as appropriate. MWDOC will work with MWD to provide program effectiveness and conservation savings information.

### **BMP 7 – Public Information Programs**

MWDOC provides a comprehensive public information program built around communication, coordination and partnerships with its member agencies and cities, MWD, and other local, state, and federal legislative and regulatory bodies. MWDOC's programs are carried out on behalf of and in coordination with its member agencies, including the City of Huntington Beach. The City participates in the monthly Public Affairs Workgroup meetings conducted by MWDOC with its member agencies to coordinate public outreach efforts and share information and ideas on a countywide basis.

Other activities the City participates in include those during Water Awareness Month and National Drinking Water Week. Most recently, City water staff participated in the Children's 2000 Water Education Festival in May where nearly 6,100 students attended. Other MWDOC activities conducted on behalf of Huntington Beach include a poster/slogan contest, a speakers bureau, facility inspection tours, regional press releases and feature story ideas, and water quality reports.

MWDOC's publications and other public information efforts supplement those of the City to reach the public with accurate information regarding present and future water

supplies, the demands for a reliable supply of high quality water, and the importance of implementing water efficient techniques and behaviors.

Information on availability of water use efficiency programs and technology, including toilet give-aways, water awareness month activities, regional programs and water rates are routinely included as water bill inserts, placed at public counters, discussed on local cable channels, and provided on request. The City's Water Division also provides literature and demonstrations at the annual Public Works Open House held each year in May. Additional water-related information, including the annual Consumer Confidence Report, can be found on the City's web site at [www.scag.org/homepages/huntington\\_beach/govt.htm](http://www.scag.org/homepages/huntington_beach/govt.htm). The MWDOC 2000 Regional UWMP details additional public information activities conducted on behalf of the City of Huntington Beach.

Effectiveness of the public information programs can be tracked through commentaries, overall water savings in the city, installation of water efficient devices, selection of arid climate plantings, and level of participation in various water use efficiency programs.

### **BMP 8 – School Education Programs**

Through MWDOC, Huntington Beach and all Orange County public and private schools receive water education programs as a free public service. Grade-specific programs with State-approved curriculum are offered for students from kindergarten through high school. Programs include classroom presentations by MWDOC staff teachers, audio-visual programs, hands-on activities, take-home materials for students, and workbooks and supplies for teachers.

During the 1999/00 school year nearly 120,000 students were educated in Orange County through MWDOC's program, and over 500,000 since the 1995 UWMP as detailed in the 2000 Regional UWMP. The number of students educated annually has doubled since 1979/80. Table 5.1 shows the number of students reached in the City of Huntington Beach through the MWDOC Water Education Program. Details of the MWDOC program can be found in the 2000 Regional UWMP

**Table 5.1**  
**MWDOC Water Education Program**  
**Number of Students Reached in Huntington Beach**

	<b>1995/96</b>	<b>1996/97</b>	<b>1997/98</b>	<b>1998/99</b>	<b>1999/00</b>	<b>Total</b>
Huntington Beach	7,423	3,715	4,989	4,954	3,920	25,001

Effectiveness of the school education programs can be tracked through observations and interviews with schools, institutions, and educators on the number of programs, level of student participation, and materials distributed and attendance in the water education

programs. The Water Education Program is funded through the MWDOC budget, which Huntington Beach supports through the cost of imported water.

### **BMP 9 – Commercial, Industrial and Institutional Programs**

In 1995/96, MWDOC designed and implemented a Commercial, Industrial and Institutional (CII) Water Use Survey Program on behalf of its member agencies with funding from MWD and the U.S. Bureau of Reclamation (USBR). The CII Program was implemented during fiscal years 1995/96 and 1996/97, and was successful in auditing 90 commercial and institutional sites and 15 industrial facilities throughout Orange County, including several sites in Huntington Beach.

A trained auditor visited each location to survey all water using devices at each site. Participants received a report detailing potential water saving areas, both through behavioral modifications and the retrofitting of specific low-flow devices. A telephone survey followed the report to gauge the level of recommended changes that were implemented. It was determined that nearly 25 percent of the suggested devices were retrofitted and all of the behavioral changes were made.

During fiscal years 1997/98 and 1998/99, MWDOC developed an in-house CII rebate program utilizing funding provided by MWD and the Orange County Sanitation District (OCSD). MWDOC's CII rebate program signified the first time MWDOC was able to acquire funds from the local waste water agency (OCSD) to assist in the installation of retrofit devices aimed at reductions in waste water flows. Participants from the CII Program were solicited to participate with rebate funds targeting specific devices identified through the survey process. Huntington Beach was successful in securing two service area participants in the rebate program

During fiscal year 1999/00, MWDOC phased out its own rebate program and began arrangements to participate in MWD's regional rebate program. While MWD utilizes a top down approach targeting corporate centers to affect major chains to retrofit multiple sites, MWDOC will work with its member agencies, including Huntington Beach, and the cities of Fullerton and Anaheim to target smaller commercial and institutional sites to retrofit high water using devices. In order to provide the highest possible funding incentive, MWDOC is looking to OCSD, the Orange County Water District (OCWD) and highly motivated member agencies to augment the funding provided by MWD and the USBR for the retrofitting of high-flow devices with low-flow devices.

The City will continue to promote and support the regional CII Program through ongoing program endorsement and distribution of informational brochures. MWDOC will provide program effectiveness and conservation savings information, and will fund the program through their budget.

## **BMP 10 – Wholesale Agency Assistance Programs**

As a member agency of MWDOC, the regional wholesaler of imported water to Orange County, Huntington Beach receives assistance to implement water use efficiency programs. MWDOC has provided assistance in 1) acquisition of more than \$6.0 million to annual grant funding from a variety of sources, 2) implementation of regional programs on behalf of Huntington Beach and all Orange County water agencies, and 3) technical assistance regarding local program design and implementation, benefit/cost analysis, conservation based rate structures, and program marketing.

The City will continue to work cooperatively with MWDOC to participate in regional BMP programs, informational groups and projects, determination of the most cost-effective BMPs, and tailoring programs specific to Huntington Beach.

## **BMP 11 – Conservation Pricing**

A definition of conservation pricing is “rates designed to recover the cost of providing service.” The City’s rates are designed in this manner.

The commodity component of the monthly water service charges is structure to recover the actual cost of water, including the groundwater replenishment assessment (RA), imported water charges, and energy and maintenance on the City’s water production facilities. The fixed portion of the monthly charges are designed to cover the cost of water distribution, meter reading and maintenance of the water distribution system. Distribution and production are distinct programs in the annual Water Division budget. Applicable portions of Administration, Engineering and Water Quality were assigned to each program when the current water rates were designed.

The City has adopted its water rate structure by ordinance. It will continue to promote water use efficiency measures and conservation, along with distribution of rate information to all new service connections.

## **BMP 12 – Conservation Coordinator**

The City has designated the Senior Administrative Analyst of the Water Division as its Conservation Coordinator. The current Conservation Coordinator has received certification from the California-Nevada Section of the American Water Works Association (AWWA) as a Level 1 Water Conservation Practitioner. Further education and training for the Coordinator and other staff will be scheduled as courses become available.

The City’s Conservation Coordinator works closely with the Water Use Efficiency staff at MWDOC to provide successful execution of regional programs, and those conducted on behalf of the City of Huntington Beach. The Conservation Coordinator may either directly participate in or be represented by MWDOC in regional workgroups including

the Water Use Efficiency Workgroup, Public Affairs Workgroup, County of Orange Supervisor's Water Task Force, and the Orange County Water Use Efficiency Steering Committee.

### **BMP 13 – Water Waste Prohibition**

The City's established "Water Use Regulations" ordinance includes provisions for waste from improper fixtures. The ordinance prohibits waste of water or water to be wasted by imperfect or leaking stops, valves, pipes, closet, faucets or other fixtures, or use water closets without self-closing valves. It also prohibits the use of water for purposes other than those named in the application upon which rates for water are based, or use it in violation of any of the provisions in any ordinance of the City. The ordinance prohibits persons from draining or permitting water to drain upon any public street or alley (also known as "gutter flooding"), or over any private property not owned by that person.

The City has permanently incorporated this BMP into its ordinances and actively enforces it. Water waste prohibition is also included in the City's Water Efficient Landscape Requirements ordinance and Water Management Program ordinance. A copy of the City's Water Use Regulations ordinance is included as Appendix D.

### **BMP 14 – Residential Ultra-Low-Flush Toilet (ULFT) Programs**

MWDOC administers a regional rebate program available to citizens of Huntington Beach and jointly funds (with MWD, OCWD and the OCSD) free ULFT distribution events throughout Orange County. A ULFT give-away was held at the City's Water Operations Yard on December 11, 1999. Nearly 1,700 toilets were distributed at this event. A second event was held on August 19, 2000 at the Huntington Beach High School. Since the onset of the regional program, nearly 17,000 ULFTs have been distributed in the City of Huntington Beach. Estimated water savings from these retrofits in Huntington Beach totals more than 600 acre feet per year. Table 5.2 shows the number of ULFT replacements in Huntington Beach for the past 10 years.

The MWDOC ULFT Replacement Program is the centerpiece of their water use efficiency effort over the last five years. MWDOC has distributed over 170,000 ULFTs throughout Orange County through several types of distribution programs over the last 10 years. Distribution formats include rebates, free distributions, co-pay distributions, and member agency distributions. All water agencies in Orange County benefit from this ongoing regional program. Estimated water savings from these retrofits total more than 6,200 acre feet per year countywide.

**Table 5.2**  
**ULFT Replacements in Huntington Beach**

	1990-1995	1995/96	1996/97	1997/98	1998/99	1999/00	Total
Huntington Beach	3,963	1,779	2,600	2,522	2,319	3,492	16,675

Source: MWDOC

**Implementation Schedule and Water Use Efficiency Program Effectiveness**

**5.4**

The ultimate goal of any water use efficiency program is to save water. The ability to quantify the volume of water saved from a program is dependent on the type of program. To advance the water industry's knowledge of savings potential of various programs, the California Urban Water Conservation Council is charged with the responsibility to identify and adopt savings estimates for the BMPs.

Additionally, the Orange County Water Plan, *Focus on Orange County's Water Future*, as discussed in the 2000 Regional UWMP, adapts and applies the MWD-MAIN Model, which forecasts water demands on both a regional basis and at the retail level to produce a refined estimate of future water demand, and the identification of potential benefits and costs associated with implementation of the BMPs. The conservation potential by retail water agency is used to develop BMP implementation plans using a "least cost approach" to develop a "most cost effective" package of BMP programs customized for each retail agency. A Conservation Savings Model estimates the potential water conservation from implementation of the BMPs. Once the potential water savings are quantified, programs can be developed to target potential savings. Implementation plans will be developed for each retail agency, detailing the most cost-effective BMPs, including wholesale-level wastewater.

Quantifiable BMP programs include ULF toilet and low-flush showerhead retrofits, water audits and conservation pricing. Programs and activities that are not quantifiable, but known to save water, include public information, school education, conservation coordinator, water waste prohibitions, and metering with commodity rates.

Water use efficiency is an integral part of water supply planning and operations. The City's Conservation Coordinator works to improve the understanding of costs and benefits of conservation so that investment decisions are efficient and effective at meeting program goals. As a cooperative member of California's conservation community, the City of Huntington Beach supports MWDOC's significant contributions to the development and coordination of water use efficiency activities for its member agencies and throughout Orange County.

Many of the BMPs have been implemented based upon the MOU schedule, others are being implemented, and all BMPs will continue on an ongoing basis. Huntington Beach

will continue to work cooperatively with MWDOC to implement cost-effective BMPs for the City. The methods to evaluate effectiveness are shown in Table 5.3 as determined by MWDOC .

**Table 5.3  
Water Use Efficiency Best Management Practices  
Implementation Schedule and Methods to Evaluate Effectiveness**

<b>Best Management Practice</b>	<b>Implementation Schedule</b>	<b>Methods to Evaluate Effectiveness</b>
1. Residential Surveys	On-going	Econometric Savings Analysis
2. Plumbing Fixture Retrofits	On-going	Plumbing Fixture Saturation Study
3. Distribution System	On-going	Monitor Pre-Screening Survey Results
4. Metering	On-going	Water agency policy for all new connections
5. Landscape	On-going	Econometric Savings Analysis
6. Clothes Washers	On-going	
7. Public Information	On-going	Not measurable, maintain minimum level of implementation
8. School Education	On-going	Not measurable, maintain minimum level of implementation
9. Commercial, Industrial and Institutional	On-going	Econometric Savings Analysis
10. Wholesaler Assistance	On-going	Not measurable, maintain minimum level of assistance
11. Conservation Pricing	On-going	Econometric Savings Analysis
12. Conservation Coordinator	On-going	Program effectiveness
13. Waste Water Prohibitions	On-going	
14. Ultra-Low-Flush Toilets	On-going	Econometric Savings Analysis

Source: MWDOC

**SECTION 6**  
**WATER SHORTAGE CONTINGENCY PLAN**

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**Introduction**

**6.1**

One dry year does not constitute a drought in California, but does serve as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure, its reservoirs, groundwater basins, and inter-regional conveyance facilities, mitigates the effect of short-term dry periods. Defining when a drought begins is a function of drought impacts to water users. Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Droughts occur slowly, over a multiyear period. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

In order to meet short-term water demand deficiencies, and short-or long-term drought requirements, Huntington Beach will implement its own water shortage policy based upon the policy of MWDOC and OCWD's water shortage/drought activities. MWDOC's policy will be based MWD's adopted Water Surplus and Drought Management Plan (WSDM Plan). The WSDM Plan is designed to guide management of regional water supplies to achieve reliability goals for southern California.

**Three Year Minimum Water Supply**

**6.2**

According to MWDOC, MWD projects 100 percent reliability for full-service demands through the year 2010. Additionally, through a variety of groundwater reliability programs conducted by OCWD and participated in by the City, local supplies are projected to be maintained at demand levels. Huntington Beach anticipates the ability to meet water demand through the next three years based on the driest historic three-years as shown in Table 6.1.

**Table 6.1**  
**Minimum Water Supply/Demand Based on Driest 3-Year History**  
Acre-feet

	<b>2001</b>	<b>2002</b>	<b>2003</b>
Supply	37,900	37,900	37,900
Demand	34,600	34,600	34,600
Difference	3,300	3,300	3,300

Source: Table 3.1, Projected Supply and Demand Comparison, and Table 3.2, Supply Reliability

### **Supplemental Water Supplies**

**6.3**

Since Huntington Beach receives 75 percent of its water supply from groundwater wells accessing the Santa Ana River groundwater basin managed by OCWD and 25 percent from MWD imported water through MWDOC, both sources are vitally important. MWDOC and OCWD are implementing water supply alternative strategies for the region and on behalf of its member agencies to insure available water in the future and during shortages.

Supplemental water supplies are discussed in Section 3, Water Reliability Planning. Supplies discussed include management of water system pressures and peak demands, water exchanges or transfers, conjunctive use programs, recycled water projects and desalination. These options include programs for expanded local supplies. Additional actions to manage limited supplies would include both operational and demand management measures, encompassing alternative rate structures, distribution of water use efficiency devices, and enhanced school education and public information.

The MWDOC 2000 Regional UWMP further discusses programs by MWDOC, OCWD and MWD for the benefit of the region and its member agencies, including Huntington Beach.

### **Water Shortage Contingency Ordinance/Resolution**

**6.4**

In 1991, the City of Huntington Beach adopted by ordinance a comprehensive Water Management Program based upon the need to conserve water supplies and to avoid or minimize the effects of future shortage. A copy of the City's Water Management Program ordinance is included as Appendix E.

### **City of Huntington Beach Water Shortage Response**

**6.5**

The City's Director of Public Works and the City Administrator, or their designated representative, are authorized and directed by City Council to implement provisions of the Water Management Program. All actions taken will be confirmed at the earliest practicable time by the City Council.

### ***Stages of Action***

The Director of Public Works determines the extent of conservation or water use efficiency required through the implementation and/or termination of particular conservation stages in order for the City to prudently plan for and supply water to its customers. The City Council directs the City Administrator to order the appropriate stage of water conservation. However, in case of local emergencies, the City Administrator has the authority to order the implementation of the appropriate stage of water conservation subject to ratification by the City Council within seven days thereafter.

The City Council has determined 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 supplies.
- b) A major failure of the supply, storage and distribution facilities of the Metropolitan Water District of Southern California or of the City occurs.
- c) A local or regional disaster, which limits the water, supply.

### ***Rationing Stages and Reduction Goals***

As introduced, Huntington Beach will implement its own water shortage policy based upon the policy of MWDOC, which will likely be based on MWD's adopted Water Surplus and Drought Management Plan (WSDM Plan). Huntington Beach will also follow the water shortage activities of OCWD based upon drought conditions.

The WSDM Plan guiding principle is to minimize adverse impacts of water shortage and ensure regional reliability. From this guiding principle come the following supporting principles:

- 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 transfers and banking programs to secure more imported water for use in dry years.
- Increase public awareness about water supply issues.

The WSDM Plan defines the expected sequence of resource management actions MWD will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands. The MWDOC 2000 Regional UWMP details each of the surplus and shortage stages, actions by stage, and allocation of supply for M&I demand. Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage, an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

Under a drought scenario, OCWD may have MWD replenishment water temporarily unavailable to them for replenishment of the groundwater basin. OCWD would first attempt to purchase other water supplies at a similar cost to replace the MWD source. If no alternative water supply sources were economically available, OCWD may temporarily mine the basin by increasing the Basin Production Percentage (BPP) to meet local demand and refill it in the future. OCWD used this strategy during the later years of the 1986-92 drought period. If this option was not available, then OCWD may lower the current 75 percent BPP to match the basin's Dependable Yield. Under this last scenario, Huntington Beach may request increased import water along with conservation and water use efficiency measures by customers to meet demand. The OCWD Master Plan Report, Chapter 14 – Basin Management Issues, further describes OCWD activities that may affect Huntington Beach during a declared drought.

**Health and Safety Requirements**

The City’s water system’s primary goal is to preserve the health and safety of its personnel and the public. Meeting this goal is a continuous function of the system – before, during and after a disaster or water shortage. Fire suppression capabilities will continue to be maintained during any water shortage contingency stage. Some water needs are more immediate than others are. The following list of public health needs and the allowable time without potable water is a guideline and will depend on the magnitude of the water shortage:

- Hospitals – continuous need
- Emergency shelters – immediate need
- Kidney dialysis – 24 hours
- Drinking water – 72 hours
- Personal hygiene, waste disposal – 72 hours

Based on commonly accepted estimates of interior residential water use in the United States, Table 6.2 indicates per capita health and safety water requirements. During the initial stage of a shortage, customers may adjust either interior and/or outdoor water use in order to meet the voluntary water reduction goal.

**Table 6.2  
Per Capita Health and Safety Water Quantity Calculations**

	Non-Conserving Fixtures		Habit Changes <sup>[1]</sup>		Conserving Fixtures <sup>[2]</sup>	
Toilet	5 flushes x 5.5 gpf	27.5	3 flushes x 5.5 gpf	16.5	5 flushes x 1.6 gpf	8.0
Shower	5 min. x 4.0 gpm	20.0	4 min. x 3.0 gpm	12.0	4 min. x 2.5 gpm	10.0
Washer	12.5 gpcd	12.5	11.5 gpcd	11.5	11.5 gpcd	11.5
Kitchen	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Other	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Total		68.0		48.0		37.5
CCF per capita per year		33.0		23.0		18.0

gpcd = gallons per capita per day  
gpf = gallons per flush  
gpm = gallons per minute  
ccf = hundred cubic feet

<sup>[1]</sup> Reduced shower use results from shorter and reduced flow. Reduced washer use results from fuller loads.

<sup>[2]</sup> Fixtures include ULF 1.6 gpf toilets, 2.5 gpm showerheads, and efficient clothes washers.

### **Priority by Use**

Conditions prevailing in the Huntington Beach area require that the water resources available be put to maximum beneficial use to the extent to which they are capable. The waste or unreasonable use, or unreasonable method of use, of water should be prevented and that water conservation and water use efficiency is encouraged with a view to the maximum reasonable and beneficial use thereof in the interests of the people of the City and for the public welfare. Preservation of health and safety will be a top priority for the City.

### **Prohibitions, Consumption Reduction Methods and Penalties 6.6**

Any violation of the City's Water Management Program, including waste of water and excessive use, is a misdemeanor. In addition to any other remedies that the City may have for enforcement, service of water would be discontinued or appropriately limited to any customer who willfully uses water in violation of any provision of the ordinance.

Huntington Beach will follow the allocation plan guidelines of MWDOC as adopted by MWD once an extreme shortage is declared. This allocation plan will be enforced by MWD using rate surcharges. MWDOC will follow the guidelines of the allocation plan and impose the surcharge that MWD applies to its member agencies that exceed their water allocation. Huntington Beach would correspondingly impose surcharges or penalties in accordance with its ordinance on excessive use of water.

### **Revenue and Expenditure Impacts and Measures to Overcome Those Impacts 6.7**

The City receives water revenue from a commodity charge, a fixed customer charge and a capital surcharge. The rates have been designed to recover the full cost of water service in the commodity charge. Therefore, the cost of purchasing water and producing groundwater would decrease as the usage or sale of water decreases. Should an extreme shortage be declared and a large reduction in water sales occurs for an extended period of time, the Water Division would reexamine its water rate structure and monitor projected expenditures.

### **Mechanisms to Determine Reductions in Water Use 6.8**

Under normal conditions, potable water production figures are recorded daily. Weekly and monthly reports are prepared and monitored. This data will be used to measure the effectiveness of any water shortage contingency stage that may be implemented.

As stages of water shortage are declared by MWDOC, Huntington Beach will follow implementation of those stages and continue to monitor water demand levels. It is not until Shortage Stage 5 that MWD may call for extraordinary conservation. During this stage, MWD's Drought Program Officer will coordinate public information activities

with MWDOC and monitor the effectiveness of ongoing conservation programs. Monthly reporting on estimated conservation water savings will be provided.

Huntington Beach will participate in monthly member agency manager meetings with MWDOC to monitor and discuss monthly water allocation charts. This will enable Huntington Beach to be aware of import water use on a timely basis as a result of specific actions taken responding to the water shortage contingency plan.

## **Preparation for Catastrophic Water Supply Interruption**

**6.9**

### ***Water Shortage Emergency Response***

A water shortage emergency could be the result of a catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions. The City maintains and exercises a comprehensive Emergency Management Program for such emergencies including Water Shortage Emergency Response. The Water Division of the Public Works Department is responsible for water operations and the maintenance of the Water & Utilities section of the City of Huntington Beach Emergency Management Plan.

The plan describes the organizational and operational policies and procedures required to meet the needs of sufficient water for firefighting operations and safe drinking water and provides a system for organizing and prioritizing water repairs. It also cites authorities and specifies the public and private organizations responsible for providing water service.

The Water Division will operate under normal operating procedures until a situation is beyond its control. This includes implementation of any allocation plan passed through by MWDOC for MWD, and water shortage contingency plans of OCWD.

If the situation is beyond Water Division's control, the Water Operations Center (WOC) may be activated to better manage the situation. If the situation warrants, the City Emergency Operations Center (EOC) may be activated at which time a water representative will be sent to the EOC to coordinate water emergency response with all other City department's emergency response. The representative sent to the EOC is called the *Water Tactical Officer*.

In the event the EOC is activated, the City management Policy Group will set priorities. When the EOC is activated, the WOC will take its direction from the EOC. An EOC *Action Plan* will be developed in the EOC that will carry out the policies dictated by the *Policy Group*. The WOC will use the EOC *Action Plan* in determining its course of action. Coordination between the WOC and the EOC will be done by the Water Operations Manager (located in the WOC) and the *Water Tactical Officer* (located in the EOC) under the direction of the *Public Works Chief* (located in the EOC).

If the situation is beyond the Water Division's and the City's control, additional assistance will be sought through coordination with the Water Emergency Response Organization of Orange County.

### ***Water Emergency Response Organization of Orange County (WEROC)***

The City of Huntington Beach Water Department actively participates in the Water Emergency Response Organization of Orange County (WEROC). WEROC performs coordination of information and mutual-aid requests among water agencies, and conducts disaster training exercises for the Orange County water community and with MWD.

In 1983, the Orange County water community developed a *Water Supply Emergency Preparedness Plan* to respond effectively to disasters impacting the regional water distribution system. This plan was jointly funded by three regional water agencies: Coastal Municipal Water District, Municipal Water District of Orange County (MWDOC), and Orange County Water District (OCWD), with the support and guidance from the Orange County Water Association (OCWA). The collective efforts of these agencies resulted in the formation of the countywide WEROC, which is unique in its ability to provide a single point of contact for representation of water agencies in Orange County during a disaster. The MWDOC 2000 Regional Urban Water Management Plan, Section 7, presents the details of WEROC.

Additional emergency services available to Huntington Beach in the State of California include the Master Mutual Aid Agreement, WARN and Plan Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement and is planned out of the California Office of Emergency Services. The California Water Agencies Response Network (WARN) includes all public agencies that have signed the agreement to WARN and provides mutual aid assistance. It is managed by a State Steering Committee. Plan Bulldozer provides mutual aid for construction equipment to any public agency for the initial time of disaster when danger to life and property exists.

## SECTION 7 WATER RECYCLING

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### **Recycled Water**

7.1

The Southern California region, from Ventura to San Diego, discharges over 1 billion gallons (1.1 million afy) of treated wastewater to the ocean each day. This is considered a reliable and drought-proof water source and could greatly reduce the area and City's reliance on imported water. As technological improvements continue to reduce treatment cost, and as public perception and acceptance continue to improve, numerous reuse opportunities should develop.

It is projected that by 2005, recycled water from OCWD's Green Acres Project, which currently produces 3,000 afy, will be available to Huntington Beach for irrigation use. Huntington Beach has projected 400 afy of recycled water through the year 2020. Infrastructure is currently in place in anticipation of the expansion of the project into Huntington Beach. OCWD's Green Acres Project has been operated since 1992 and typically supplies retail users such as parks, industry, golf courses, etc. These supplies are locally controlled and highly reliable. In addition, new development in Huntington Beach is required to install facilities for recycled water conveyance where appropriate.

### **Wastewater Collection and Treatment in Huntington Beach**

7.2

The Orange County Sanitation District (OCSD) provides wastewater services for more than 2.2 million residents in 23 cities, including Huntington Beach, within a 450-square mile portion of northern Orange County. Huntington Beach operates and maintains the localized sewer branches that feed into OCSD's trunk system from the City.

OCSD operates the third largest wastewater system on the west coast, consisting of over 500 miles of trunk sewers and 200 miles of subtrunk sewers, two regional treatment plants, and an ocean disposal system.

### **Sewer Systems**

The Huntington Beach sewer system includes 575 miles of sewer lines, 10,000 manholes and 28 lift stations. The OCSD sewerage system collects wastewater through an extensive system of gravity flow sewers, pump stations, and pressurized sewers (force mains). The sewer system consists of 12 trunk sewer systems ranging in size from 12 to 96 inches in diameter and collectively over 500 miles long. Additionally, there are 39 sewer interconnections and 87 diversions to maximize conveyance of flows through the system. Twenty pump stations are used to pump sewage from lower lying areas to the treatment plants.

### **OCS D Treatment Plants**

OCS D's Reclamation Plant No. 1 is located in Fountain Valley about 4 miles northeast of the ocean and adjacent to the Santa Ana River. The plant provides advanced primary and secondary treatment and supplies secondary treatment water to OCWD which further treats and distributes the water for various uses, including irrigation, groundwater recharge, and operation of coastal seawater barrier system.

Huntington Beach wastewater flows are directed to OCS D's Treatment Plant No. 2 located in Huntington Beach adjacent to the Santa Ana River and about 1,500 feet from the ocean. This plant receives raw wastewater from five major sewers. Plant capacity is 174 million gallons per day (mgd) of wastewater, with a historical flow of 90 mgd. Average daily flow from Huntington Beach is estimated at 29 mgd.

The treatment process at Reclamation Plant No. 2 is similar to Reclamation Plant No. 1. Approximately 33 percent of the influent receives secondary treatment through an activated sludge system. All of the effluent from this plant is discharged to the ocean disposal system.

### **Regional Recycled Water Planning**

### **7.3**

Huntington Beach supports efforts of the regional water management agencies to utilize recycled water as a primary resource for groundwater recharge in Orange County. Since Huntington Beach receives 75 percent of its water supply from groundwater, it would benefit from the use of recycled water for groundwater recharge.

Recycled water in the County is also used to irrigate crops, golf courses, parks, schools, business landscapes, residential lawns, and some industrial uses. In 1999/00, over 30,000 acre-feet of recycled water was applied by water retailers in Orange County. In addition, recycled water has played a significant part in the Orange County groundwater basin through its use as a barrier to saltwater intrusion.

OCS D produces recycled water year round for OCWD's Green Acres Project (GAP), providing recycled water for industrial customers and landscape irrigation in Fountain Valley, Santa Ana, Costa Mesa, Newport Beach and Huntington Beach. It also produces recycled water for OCWD's Groundwater Injection System. OCWD and OCS D's proposed Groundwater Replenishment System (GWRS) would increase the use of recycled water for groundwater recharge over the next 20 years by 119 percent.

Recycled water use and projections in Orange County can be found in the MWDOC 2000 Regional Urban Water Management Plan. The projections for expanded development of water recycling are based upon several "institutional assumptions" that vary depending on the end use of the recycled water. Development of recycled water projects generally requires creative solutions to funding, regulatory requirements, institutional arrangements and public acceptance.

Determining the technical and economic feasibility of a recycled water project requires a relative comparison to alternative water supply options. This comparison entails a detailed analysis of the costs and benefits of each alternative supply. A detailed discussion of the methods and issues in determining the relative cost effectiveness of recycled water projects is described in the draft "Urban Water Recycling Feasibility Assessment Guidebook," Section 3 (California Urban Water Agencies, September 1998).

In 1993, the Department of Water Resources, in cooperation with the U.S. Bureau of Reclamation (USBR) and seven southern California water agencies, including MWD, undertook a study to evaluate the feasibility of a regional water reclamation plan. The Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS) is a six-year effort to identify regional reclamation systems, and promote efficient use of total water resources by increasing the use of recycled water and identifying opportunities for and constraints to maximizing water reuse in Southern California.

Based upon draft findings of the SCCWRRS, a regional water recycling system that spans the entire study area is not practical or feasible; however, subregional systems warrant further evaluation. Orange County and the Lower Santa Ana River Watershed has been identified as one of the four geographical regions, and is being examined for a regional water recycling system for short-term (2010) and long-term (2040) applications. Additional information on this study has been reference in both MWDOC's and MWD's 2000 Regional Urban Water Management Plans. The DWR, Division of Planning and Local Assistance, web site also presents information on the SCCWRRS.

OCWD is planning large increases in indirect recycling. The amount of treated wastewater in the Santa Ana River is projected to increase due to population growth in Riverside and San Bernardino Counties. OCWD and OCSD's proposed Groundwater Replenishment System (GWRS) program is a single recharge project that could ultimately supply 120,000 AF/yr that is currently lost to the ocean.

### ***OCWD/OCSD Groundwater Replenishment System (GWRS)***

The GWRS is being developed jointly by OCWD and OCSD. The objective of the project is to develop a new source of reliable, high quality, low salinity water that will be used to replenish the basin and expand the existing seawater intrusion barrier. The GWRS would supplement existing water supplies, and provide a new, cost-effective and reliable source of water to recharge the Orange County Groundwater Basin, protect the basin from further degradation due to seawater intrusion, and augment the supply of recycled water for irrigation and industrial use.

The GWRS would take secondary, treated municipal wastewater from the OCSD Reclamation Plant No. 2 in Fountain Valley and further clean this water to levels that exceed current drinking water standards. This will allow it to be used for groundwater recharge, injection into the seawater barrier, and for landscape irrigation and industrial process water, rather than having to discharge it into the Pacific Ocean.

A portion of the treated product water would be pumped upstream via the major conveyance pipeline generally paralleling the Santa Ana River to a spreading basin and allowed to percolate into the Orange County Groundwater Basin. However, most of the treated water would also be injected into the ground to create an expanded Seawater Intrusion Barrier. A small portion of the treated water will be made available to supplement the irrigation demands of OCWD's existing Green Acres Project. Some of the treated water may also be made available for use as industrial process water, irrigation water or for other approved uses via connections to the major conveyance pipeline in industrial areas, business parks, golf courses, and parks located near the Santa Ana River alignment.

Some of the benefits of the proposed GWRS to Huntington Beach, MWDOC's service area, all of Orange County and California include:

- Supply a significant amount of recycled water required by OCWD to maintain a high basin production percentage by the year 2020.
- Provide a reliable replenishment water supply in times of drought.
- Expand the seawater intrusion barrier to sustain additional groundwater production in the coastal zone.

Detailed discussion on the proposed GWRS can be found in the MWDOC 2000 Regional UWMP and the OCWD Master Plan Report.

## **Encouraging Recycled Water Use**

## **7.4**

Recent studies of water recycling opportunities within southern California provide a context for promoting the development of water recycling plans. It is recognized that broad public acceptance of recycled water requires education and public involvement.

### ***Public Education***

Huntington Beach participates in the MWDOC public education and school education programs, which include extensive sections on water recycling. MWDOC's water use efficiency public information programs are a partnership with Huntington Beach and other agencies.

Through a variety of public information programs, MWDOC assists Huntington Beach in reaching the public with accurate information regarding present and future water supplies, the demands for a suitable quantity and quality of water, including recycled water, and the importance of implementing water efficient techniques and behaviors. Through MWDOC, water education programs have reached thousands of Huntington Beach students with grade-specific programs that include information on recycled water.

### **Financial Incentives**

The implementation of recycled water projects involve a substantial upfront capital investment for planning studies, environmental impact reports, engineering design and construction before there is any recycled water to market. For some water agencies, these capital costs exceed the short-term expense of purchasing additional imported water supplies from MWD even though a regional analysis in the SCCCWRRS shows that net benefits are far greater than direct costs

The establishment of new supplemental funding sources through federal, state and regional programs now provide significant financial incentives for local agencies to develop and make use of recycled water. Potential sources of funding include federal, state and local funding opportunities. These funding sources include the USBR, California Proposition 13 Water Bond, and MWD Local Resources Program. These funding opportunities may be sought by the City of Huntington Beach or possibly more appropriately by regional agencies. The City will continue to support seeking funding for regional water recycling projects and programs. More detail on these funding programs can be found in the MWDOC 2000 Regional UWMP.

### **Optimizing Recycled Water Use**

### **7.5**

As the recycled water system in Huntington Beach is expanded, most of the water will be used for irrigation. In Orange County, the majority of recycled water is used for irrigating golf courses, parks, schools, business and communal landscaping. However, recycled water use can increase by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pumping stations and transmission mains to reach areas far from the treatment plants. Gains in implementing some of these projects have been made throughout the county; however, the additional costs, large energy requirements and facilities create such projects very expensive to pursue.

To optimize the use of recycled water, a cost/benefit analysis must be conducted for each potential project. Once again, this brings about the discussion on technical and economic feasibility of a recycled water project requiring a relative comparison to alternative water supply options. For Huntington Beach, analysis has shown capital costs exceed the short-term expense of purchasing additional imported water supplies from MWD through MWDOC.

Huntington Beach will continue to conduct cost/benefit analysis for recycled water projects, and seek creative solutions and a balance to recycled water use, in coordination with MWDOC, OCWD, MWD and other cooperative agencies. These include solutions to funding, regulatory requirements, institutional arrangements and public acceptance.