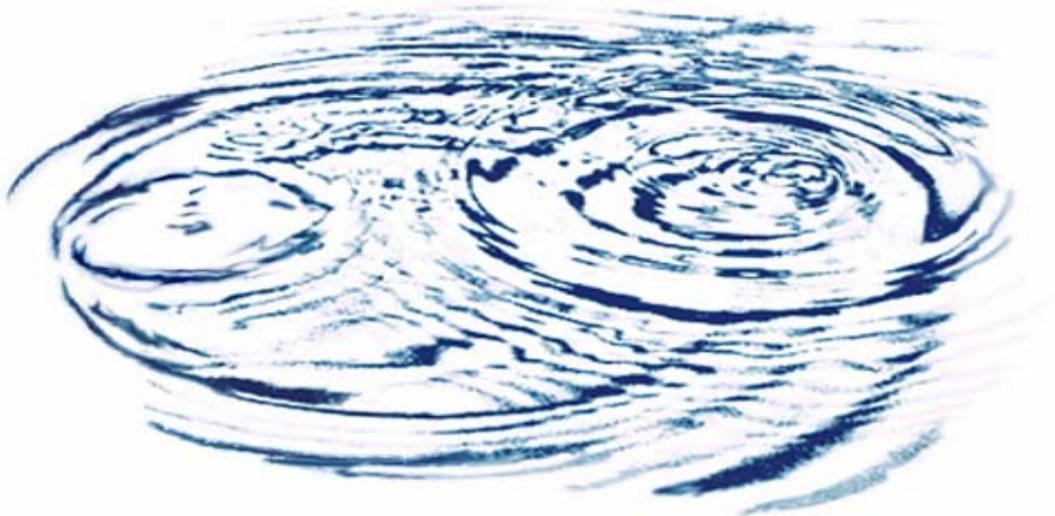




CITY OF MANHATTAN BEACH

2010 Urban Water Management Plan



December 2011



861 Village Oaks Drive, Suite 100 • Covina, California 91724
Phone: (626) 967-6202 • FAX: (626) 331-7065 • Web site: www.stetsonengineers.com

Northern California • Southern California • New Mexico • Arizona • Nevada • Colorado

<This Page Intentionally Left Blank>

TABLE OF CONTENTS

	<u>Page</u>
Section 1	1-1
Plan Preparation	1-1
1.1 Background	1-1
1.2 Coordination	1-3
1.2.1 Coordination with Appropriate Agencies.....	1-3
1.2.2 Notification to Cities and Counties.....	1-4
1.2.3 Plan Distribution	1-5
1.2.4 Public Participation	1-5
1.3 Plan Adoption, Submittal, and Implementation.....	1-6
1.3.1 Submittal of Amended Plan	1-6
1.3.2 Plan Adoption	1-6
1.3.3 Plan Implementation.....	1-7
1.3.4 Plan Submittal	1-7
1.3.5 Public Review	1-8
Section 2	2-1
System Description	2-1
2.1 Background	2-1
2.1.1 City of Manhattan Beach	2-1
2.2 Service Area Physical Description.....	2-4
2.2.1 Service Area	2-4
2.2.2 Climate	2-4
2.3 Service Area Population	2-6
2.3.1 Population	2-6
2.3.2 Other Demographic Factors	2-7

<This Page Intentionally Left Blank>

**TABLE OF CONTENTS
(Continued)**

	<u>Page</u>
Section 3	3-1
System Demands	3-1
3.1 Water Demands.....	3-1
3.1.1 Past, Current, and Projected Water Demand	3-1
3.2 Baselines And Targets	3-3
3.2.1 Baseline Daily Per Capita Water Use	3-3
3.2.2 Urban Water Use Target	3-9
3.2.3 Compliance Daily Per Capita Water Use	3-11
3.2.4 Minimum Water Use Reduction Requirement.....	3-12
3.2.5 Progress Report	3-13
3.3 Water Demand Projections.....	3-14
3.3.1 Projected Water Demand for Lower Income Households	3-18
3.4 Water Use Reduction Plan	3-18
Section 4	4-1
System Supplies	4-1
4.1 Water Sources.....	4-1
4.2 Groundwater.....	4-4
4.2.1 Groundwater Management.....	4-4
4.2.2 Description of Groundwater Basin	4-6
4.2.3 Location, Amount and Sufficiency of Groundwater Pumped For The Past Five Years	4-8
4.2.4 Location and Amount of Groundwater Projected and be Pumped.....	4-9
4.3 Transfer Opportunities.....	4-10
4.3.1 Short-Term	4-10

<This Page Intentionally Left Blank>

**TABLE OF CONTENTS
(Continued)**

	<u>Page</u>
4.3.2 Long-Term.....	4-11
4.4 Desalinated Water Opportunities.....	4-11
4.5 Recycled Water Opportunities.....	4-13
4.5.1 Recycled Water and Potential For Use.....	4-13
4.5.2 Wastewater Collection, Treatment, and Disposal.....	4-13
4.5.3 Current Recycled Water Use.....	4-16
4.5.4 Potential Uses of Recycled Water.....	4-19
4.5.5 Projected Recycled Water Use.....	4-20
4.5.6 Encouraging Use of Recycled Water.....	4-21
4.5.7 Plan For Optimizing Use of Recycled Water.....	4-22
4.6 Future Water Projects.....	4-23
Section 5.....	5-1
Water Supply Reliability and Water Shortage Contingency Planning.....	5-1
5.1 Water Supply Reliability.....	5-1
5.1.1 Water Management Tools.....	5-1
5.1.2 Supply Inconsistency.....	5-1
5.2 Water Shortage Contingency Planning.....	5-3
5.2.1 Catastrophic Interruption of Water Supplies.....	5-3
5.2.2 Mandatory Prohibitions.....	5-5
5.2.3 Consumption Reduction Methods.....	5-9
5.2.4 Penalties Or Charges for Excessive Use.....	5-14
5.2.5 Revenue and Expenditure Impacts.....	5-15
5.2.6 Draft Water Shortage Contingency Resolution or Ordinance.....	5-16
5.3 Water Quality.....	5-18

<This Page Intentionally Left Blank>

TABLE OF CONTENTS
(Continued)

	<u>Page</u>
5.3.1 Groundwater.....	5-18
5.3.2 Imported Water.....	5-19
5.4 Drought Planning.....	5-19
5.4.1 Reliability of Supply and Vulnerability to Seasonal or Climatic Shortage.....	5-19
5.4.2 Stages of Action in Response to Water Supply Shortages.....	5-21
5.4.3 Three Year Minimum Water Supply.....	5-25
5.4.4 Water Use Reduction Measuring Mechanism.....	5-26
5.4.5 Assessment of the Reliability of Water Service	5-27
Section 6	6-1
Demand Management Measures	6-1
6.1 Demand Management Measures Being Implemented.....	6-2
6.1.1 Water Survey Programs for Single-Family Residential and Multifamily Residential Customers [10631(F)(1)(A)]	6-2
6.1.2 Residential Plumbing Retrofit [10631(F)(1)(B)].....	6-3
6.1.3 System Water Audits, Leak Detection, and Repair [10631(F)(1)(C)].....	6-4
6.1.4 Metering With Commodity Rates for All New Connections and Retrofit of Existing Connections [10631(F)(1)(D)]	6-4
6.1.5 Large Landscape Conservation Programs and Incentives [10631(F)(1)(E)].....	6-5
6.1.6 High-Efficiency Washing Machine Rebate Programs [10631(F)(1)(F)].....	6-6
6.1.7 Public Information Programs [10631(F)(1)(G)]	6-7
6.1.8 School Education Programs [10631(F)(1)(H)]	6-7
6.1.9 Conservation Programs for Commercial, Industrial and Institutional Accounts [10631(F)(1)(I)].....	6-8
6.1.10 Conservation Pricing [10631(F)(1)(K)].....	6-8
6.1.11 Water Conservation Coordinator [10631(F)(1)(L)].....	6-9

<This Page Intentionally Left Blank>

TABLE OF CONTENTS
(Continued)

	<u>Page</u>
6.1.12 Water Waste Prohibition [10631(F)(1)(M)].....	6-9
6.1.13 Residential Ultra-Low Flush Toilet Replacement Programs [10631(F)(1)(N)]..	6-10
6.2 Demand Management Measures Not Implemented	6-11
6.2.1 Wholesale Agency Programs [10631(F)(1)(J)]	6-11
Section 7	7-1
Completed Urban Water Management Checklist	7-1

<This Page Intentionally Left Blank>

**TABLE OF CONTENTS
(Continued)**

LIST OF TABLES

Table 1-1	Coordination with Appropriate Agencies	1-4
Table 2-1	Climate.....	2-5
Table 2-2	Population – Current and Projected	2-6
Table 3-1	Water Deliveries – Actual, 2005.....	3-2
Table 3-2	Water Deliveries – Actual, 2010.....	3-2
Table 3-3	Base Period Ranges	3-4
Table 3-4	Historical Potable Water Demands	3-6
Table 3-5	Base Daily Per Capita Water Use – 10 to 15Year Range	3-7
Table 3-6	Base Daily Per Capita Water Use – 5Year Range	3-12
Table 3-7	Calculation of Projected Water Demand	3-14
Table 3-8	Water Deliveries – Projected, 2015	3-15
Table 3-9	Water Deliveries – Projected, 2020	3-15
Table 3-10	Water Deliveries – Projected, 2025 and 2030.....	3-15
Table 3-11	Sales to Other Water Agencies.....	3-16
Table 3-12	Additional Water Uses and Losses	3-16
Table 3-13	Total Water Use	3-17
Table 3-14	Retail Agency Demand Projections Provided to Wholesale Suppliers..	3-17
Table 3-15	Low-Income Projected Water Demands	3-18
Table 4-1	Water Supplies – Current and Projected.....	4-1
Table 4-2	Wholesale Supplies – Existing and Planned Sources of Water	4-2
Table 4-3	Groundwater – Volume Pumped	4-9
Table 4-4	Groundwater – Volume Projected to be Pumped.....	4-10
Table 4-5	Transfer and Exchange Opportunities	4-10
Table 4-6	Recycled Water – Wastewater Collection and Treatment.....	4-15
Table 4-7	Non-Recycled Wastewater Disposal.....	4-16
Table 4-8	Capacities of Recycled Water Users	4-17
Table 4-9	2005 UWMP Use Projection Compared to 2010 Actual.....	4-18

<This Page Intentionally Left Blank>

**TABLE OF CONTENTS
(Continued)**

Table 4-10	Recycled Water – Potential Future Use	4-20
Table 4-11	Methods to Encourage Recycled Water Use	4-22
Table 4-12	Future Water Supply Projects	4-24
Table 5-1	Factors Resulting in Inconsistency of Supply.....	5-2
Table 5-2	Water Quality – Current and Projected Water Supply Impacts	5-2
Table 5-3	Water Shortage Contingency – Mandatory Prohibitions	5-9
Table 5-4	Water Shortage Contingency – Consumption Reduction Methods	5-13
Table 5-5	Water Shortage Contingency – Penalties and Charges.....	5-14
Table 5-6	Basis of Water Year Data	5-20
Table 5-7	Water Shortage Contingency – Rationing Stages to Address Water Supply Shortages	5-24
Table 5-8	Supply Reliability — Historic Conditions	5-25
Table 5-9	Supply Reliability – Current Water Sources	5-25
Table 5-10	Supply and Demand Comparison – Normal Year	5-28
Table 5-11	Supply and Demand Comparison – Single Dry Year	5-28
Table 5-12	Supply and Demand Comparison – Multiple Dry Year Events.....	5-29

LIST OF FIGURES

Figure 2-1	City of Manhattan Beach Regional Map.....	2-2
Figure 2-2	City of Manhattan Beach Location Map	2-2

<This Page Intentionally Left Blank>

**TABLE OF CONTENTS
(Continued)**

LIST OF APPENDICES

- Appendix A Urban Water Management Planning Act
- Appendix B Water Conservation Bill of 2009
- Appendix C Coordination Letters
- Appendix D Notice of Public Hearing
- Appendix E Resolution Adopting Plan
- Appendix F West Coast Basin Judgment
- Appendix G West Coast Basin Groundwater Levels
- Appendix H DWR Bulletin 118 West Coast Subbasin
- Appendix I WBMWD 2010 Plan
- Appendix J Recycled Water System
- Appendix K Manhattan Beach, California, Code of Ordinances, Chapter 7,44, Water Conservation
- Appendix L Revised Water Shortage Contingency Plan
- Appendix M 2010 Annual Water Quality Report
- Appendix N Ordinance No. 2138 (Toilet Retrofit Requirements)
- Appendix O Completed Urban Water Management Plan Checklist

<This Page Intentionally Left Blank>

**SECTION 1
PLAN PREPARATION**

1.1 BACKGROUND

Section 10617. “Urban Water Supplier” means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers.

Section 10620.

- (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).*
- (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*
- (c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.*
- (d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.
(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*
- (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.*

This Urban Water Management Plan (Plan) was prepared in accordance with the California Urban Water Management Planning Act (Act)¹ which became effective on January 1, 1985. The Act requires every “urban water supplier” to prepare and adopt a Plan, to periodically review its Plan at least once every five years and make any amendments or changes which are indicated by the review. An “Urban Water Supplier” is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more

¹ Water Code Sections 10610 through 10656

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

than 3,000 acre-feet of water annually. The City of Manhattan Beach (City) is an urban water supplier and is required to prepare a Plan in accordance with the Act. The primary objective of the Act is to direct urban water suppliers to evaluate their existing water conservation efforts and, to the extent practicable, review and implement alternative and supplemental water conservation measures. Sections 10610 through 10656 of the California Water Code, Urban Water Management Planning Act, were enacted in 1983. The Act, originally known as Assembly Bill (AB) 797, is included in Appendix A.

There have been new amendments added to the Plan and some reorganization of the California Water Code sections since 2005. Some significant additions and changes are noted below:

- Senate Bill (SB) 1087 – Requires reporting of water use projections for lower income households.
- AB 1376 – Requires the City to provide at least a 60 day notice prior to a public hearing to any city or county within which the City provides water supplies notifying that the City is reviewing the Plan and is considering changes.
- AB 1420 – Requires the City to verify compliance of Demand Management Measures (See Chapter 6) in order to qualify for water management grants or loans.
- SBX7-7 – Requires 20 percent reduction in urban per capita water use by the year 2020 (See Appendix B).

Section 10621(a) of the California Water Code states, “Each water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.” SBX7-7 extended the adoption date of the 2010 Plan to July 1, 2011 to accommodate the inclusion of water conservation requirements. The City’s 2010 Plan is an update to the City’s 2005 Plan.

1.2 COORDINATION

1.2.1 COORDINATION WITH APPROPRIATE AGENCIES

Section 10620.

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

Section 10621

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

The City is required to coordinate the preparation of the Plan with appropriate agencies in the area, including appropriate water suppliers that share a common source. Therefore, the City coordinated the preparation of the Plan with the County of Los Angeles, California Water Service Company, West Basin Municipal Water District (WBMWD), Water Replenishment District of Southern California (WRD), and the City of El Segundo (see Table 1-1). The City notified these agencies of the preparation of the 2010 Plan and invited them to participate in the development of the 2010 Plan. A copy of the notification letters sent to these agencies is located in Appendix C. Table 1-1 indicates whether comments were provided to the City regarding the preparation of the 2010 Plan.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

**Table 1-1 Coordination with Appropriate Agencies
(DWR Guidebook ² Table 1)**

Table 1 Coordination with appropriate agencies							
Coordinating Agencies ^{1,2}	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved / No information
City of El Segundo					X	X	
Water Replenishment District					X	X	
West Basin Municipal Water District					X	X	
California Water Service Company					X	X	
County of Los Angeles					X	X	
Other							

¹ Indicate the specific name of the agency with which coordination or outreach occurred.
² Check at least one box in each row.

1.2.2 NOTIFICATION TO CITIES AND COUNTIES

Section 10642

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

The City encourages the active involvement of the population within its service area prior to and during the preparation of the Plan. Pursuant to Section 6066 of the Government Code, the City published a Notice of Public Hearing in the newspaper on December 1, 2011, December 8, 2011, and December 15, 2011. A Notice of Public Hearing was provided to the City Clerk’s office and was posted on the City’s website. Additionally, a Notice of Public Hearing was sent to the County of Los Angeles, California Water Service Company, WBMWD, WRD, and the City of El Segundo. To ensure that the plan was available for review, the City placed a copy of the draft Plan at

² State of California, Department of Water Resources (DWR), 2011. *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan, Final*. March 2011.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

the Department of Public Works and on its website. Copies of the Notice of Public Hearing are provided in Appendix D.

1.2.3 PLAN DISTRIBUTION

Section 10635(b)

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

The City will provide its Final Plan to the County of Los Angeles, California Water Service Company, WBMWD, WRD, and the City of El Segundo no later than 60 days after submission of its Final Plan to the State of California, Department of Water Resources (DWR). A copy of the letter transmitting the 2010 Plan to each of these cities and county will be maintained in the City's file.

1.2.4 PUBLIC PARTICIPATION

Section 10642

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

The City made the draft 2010 Plan available for public review at the Department of Public Works and on the City's website and published a Notice of Public Hearing in a local newspaper, as shown in Appendix D. Public notification of the hearing, including the time and place of the hearing, was made pursuant to Section 6066 of the Government Code. In the same newspaper notice, the City indicated the draft 2010

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Plan update was available at the Department of Public Works and on the City's website. The Notice of Public Hearing was published and distributed to allow involvement of social, cultural, and economic community groups. Notice of the time and place of the Public Hearing was also provided to the County of Los Angeles, California Water Service Company, WBMWD, WRD, and the City of El Segundo (see Appendix D).

1.3 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

1.3.1 SUBMITTAL OF AMENDED PLAN

Section 10621

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

If DWR requires significant changes to the 2010 Plan before it determines the Plan to be "complete," the City will submit an amendment or a revised Plan. The amendment or revised Plan will undergo adoption by the City's governing board prior to submittal to DWR.

1.3.2 PLAN ADOPTION

Section 10642

After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

The City held a public hearing on December 20, 2011. Following the public hearing, the City adopted the draft Plan as its Plan. A copy of the resolution adopting the Plan is provided in Appendix E.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

1.3.3 PLAN IMPLEMENTATION

Section 10643

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

The City is committed to the implementation of its 2010 Plan in accordance with Section 10643 of the Act, including the water demand management measures (DMMs) (see Section 6) and water conservation requirements of SBX7-7 (see Section 3). The City continues to be committed to the concept of good water management practice and intends to expand its water conservation program as budgets and staffing allow. The City's water conservation program will periodically be re-evaluated and modified to institute additional methods or techniques as the need arises. The City reviewed implementation of its 2005 Plan and incorporated changes to create the 2010 Plan.

1.3.4 PLAN SUBMITTAL

Section 10644(a)

An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

Within 30 days of adoption of the Plan by the City, a copy of the Plan will be filed with DWR, California State Library, County of Los Angeles, California Water Service Company, WBMWD, WRD, and the City of El Segundo. Copies of the transmittal letters will be maintained in the City's file.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

1.3.5 PUBLIC REVIEW

Section 10645

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

Within 30 days after submittal of the 2010 Plan to DWR, the City will make the 2010 Plan available for public review at its Department of Public Works during normal business hours and on its website.

SECTION 2 SYSTEM DESCRIPTION

2.1 BACKGROUND

2.1.1 CITY OF MANHATTAN BEACH

Included in a land grant from Mexico, the Rancho Sausal Redondo consisted of approximately 22,500 acres, including the present site of the City of Manhattan Beach. Major development began in 1888 when the railroad was constructed between Redondo Beach Wharf and Downtown Los Angeles. By the early 1900's, the northern portion of the site was called Shore Acres and was owned by George Peck. The southern portion was owned by John Merrill who named it after his old home Manhattan in New York City. Ultimately, the fate of the City's name was left to a coin flip, in which "Manhattan" won.

The City is located on the western edge of Los Angeles County, approximately 22 miles southwest of downtown Los Angeles. The City's regional location is depicted on Figure 2-1. The City is bordered by the City of El Segundo to the north, the Cities of Hawthorne and Redondo Beach to the east, and the Cities of Redondo Beach and Hermosa Beach to the south. Currently the City is comprised of approximately 3.9 square miles of primarily residential land use. Commercial land uses are located along Highland Avenue, Manhattan Beach Boulevard, Sepulveda Boulevard, and in Manhattan Village, which is located south east of Rosecrans Avenue and Sepulveda Boulevard. Industrial land uses primarily consist of the Northrop Grumman and Raleigh Studios, which are located northwest of Aviation Boulevard and Marine Avenue. A City location map is provided in Figure 2-2.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Figure 2-1 City of Manhattan Beach Regional Map



Source: City of Manhattan Beach Water Master Plan, October 2010

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Figure 2-2 City of Manhattan Beach Location Map



Source: City of Manhattan Beach website

The City provides water service within the City of Manhattan Beach. The City obtains water supplies through two (2) groundwater wells overlying the West Coast Basin and imported water supplies from Metropolitan Water District of Southern California (MWD), through WBMWD. The City also receives recycled water supplies through WBMWD. The City’s water supply sources are described further in Section 4. Regional water supplies are described in WBMWD’s 2010 Plan (See Appendix I).

2.2 SERVICE AREA PHYSICAL DESCRIPTION

Section 10631.

A plan shall be adopted in accordance with this chapter and shall do the following:

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

2.2.1 SERVICE AREA

The City provides water service within the City of Manhattan Beach. The City is located on the western edge of Los Angeles County, approximately 22 miles southwest of downtown Los Angeles. The City's regional location is depicted on Figure 2-1. The City is bordered by the City of El Segundo to the north, the Cities of Hawthorne and Redondo Beach to the east, and the Cities of Redondo Beach and Hermosa Beach to the south. Currently the City encompasses an area of approximately 3.9 square miles.

The City currently has a population of approximately 35,182. The primary service connections are residential with some commercial, institutional, industrial, and landscape irrigation users. It is estimated that the population in 2030 will be approximately 37,270 (see Chapter 2.3 below). The projected water demands and service connections by user categories are discussed in Chapter 3.

2.2.2 CLIMATE

The City's climate is characterized by typically warm, dry summers and wet, cool winters with an average precipitation level of approximately 12.23 inches per year. The combination of mild climate and low rainfall makes the area a popular residential destination.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Metropolitan areas with low precipitation, such as Southern California, are vulnerable to droughts. Historically, the City and the surrounding areas have experienced patterns of multiple dry years that have resulted in severe drought periods as was experienced from: 1977 to 1978; 1989 to 1992; 1999 to 2004; and most recently, 2007 to 2009. Drought conditions increase the water demand given that less natural precipitation is available to meet landscaping irrigation needs. Drought conditions exacerbate shortages given that this increase in water demand is compounded with a decrease in natural supply. Table 2-1 illustrates the historical average climate conditions for the City (between 1914 and 2005), including average rainfall, average temperature, and average evapotranspiration (Eto).

Table 2-1 Historical Average Annual Evapotranspiration, Rainfall, and Temperature

	Standard Monthly Average Eto (inches)	Average Rainfall (inches)	Average Temperature (Fahrenheit)
January	1.8	2.7	65.1
February	2.0	2.8	65.4
March	3.48	1.93	65.2
April	4.21	0.78	67.5
May	4.62	0.17	69.2
June	4.5	0.1	72.0
July	5.4	0.0	75.2
August	5.1	0.1	76.4
September	4.2	0.2	76.1
October	2.94	0.37	73.6
November	1.83	1.46	70.3
December	1.46	1.74	66.1
Total Annual	41.5	12.23	70.2

Sources:

Rainfall and Temperature data: West Basin Municipal Water District's 2010 Urban Water Management Plan, Western Climate Center's web site at the Los Angeles WSO Airport Station between 1/1/1914 and 12/31/2005 <http://wrcc.dri.edu/cgi-bin/cliMAIN.pl?calosa>.

Eto data: California Irrigation Management Information System (CIMIS) at the Long Beach Station for the Los Angeles Region between 1/1/2000 and 12/31/2010. <http://www.cimis.water.ca.gov/cimis/welcome.jsp>

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

2.3 SERVICE AREA POPULATION

Section 10631.

A plan shall be adopted in accordance with this chapter and shall do the following:

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

2.3.1 POPULATION

The City currently serves a population of approximately 35,182. Present and projected populations served by the City are provided on Table 2-2. Population estimates for 2010 are based upon the US Census Bureau and the State of California, Department of Finance (DOF) estimates. Population projections through year 2030 were developed based upon projected percent increases in the City's population, as determined by the Southern California Association of Governments (SCAG). The SCAG data incorporates demographic trends, existing land use, general plan land use policies, and input and projections from the DOF and US Census Bureau.

Table 2-2 Population – Current and Projected
(DWR Guidebook Table 2)

Population – Current and Projected							
	2010	2015	2020	2025	2030	2035 - optional	Data source ²
Service Area Population¹	35,182	36,042	36,924	37,097	37,270	--	US Census, DOF, SCAG

¹ Service area population is defined as the population served by the distribution system. See Technical Methodology

² DOF = California Department of Finance. SCAG = Southern California Association of Governments.

2.3.2 OTHER DEMOGRAPHIC FACTORS

There are no other demographic factors affecting the City's water management planning.

<This Page Intentionally Left Blank>

SECTION 3 SYSTEM DEMANDS

3.1 WATER DEMANDS

3.1.1 PAST, CURRENT, AND PROJECTED WATER DEMAND

Section 10631(e)

- (1) *Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:*
 - (A) *Single-family residential.*
 - (B) *Multifamily.*
 - (C) *Commercial.*
 - (D) *Industrial.*
 - (E) *Institutional and governmental.*
 - (F) *Landscape.*
 - (G) *Sales to other agencies.*
 - (H) *Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.*
 - (I) *Agricultural*
- (2) The water use projections shall be in the same five-year increments described in subdivision (a).

The City's water supply sources include water pumped from the West Coast (Groundwater) Basin, a connection with WBMWD for delivery of treated water imported from the Colorado River and the State Water Project, and recycled water from the WBMWD. The City's main source of water is purchased imported water from WBMWD. The City provides water service to the following water use sectors:

- Residential (Single-Family and Multi-Family)
- Commercial/Institutional
- Industrial
- Landscape Irrigation.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 3-1 and Table 3-2 show the past and current water use, among water use sectors, within the City’s service area. Projected water use is calculated based on the urban per capita water use target developed per SBX7-7 (see Section 3.2 below) and population projections. Based on the projected water uses, the City does not anticipate any problem meeting the water demands.

Table 3-1 Water Deliveries – Actual, 2005
(DWR Guidebook Table 3)

Table 3 Water deliveries – actual, 2005					
	2005				
	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
Water use sectors					
Single family	11,345	4,448			4,448
Multi-family	1,226	465			465
Commercial / Institutional	510	830			830
Industrial	5	487			487
Landscape	119	163			163
Agriculture					0
Other					0
Total	13,205	6,393	0	0	6,393

Units are in acre-feet per year.

Table 3-2 Water Deliveries – Actual, 2010
(DWR Guidebook Table 4)

Table 4 Water deliveries – actual, 2010					
	2005				
	Metered		Not metered		Total
	# of accounts	Volume	# of accounts	Volume	Volume
Water use sectors					
Single family	11,586	3,588			3,588
Multi-family	1,251	375			375
Commercial / Institutional	520	670			670
Industrial	5	393			393
Landscape	120	131			131
Agriculture					0
Other					0
Total	13,482	5,158	0	0	5,158

Units are in acre-feet per year.

3.2 BASELINES AND TARGETS

Section 10608.20 (e)

An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

Methodologies for calculating Baseline Daily Per Capita Water Use and compliance Urban Per Capita Water Use Target for the consistent implementation of the Water Conservation Bill of 2009 were published by DWR in its October, 2010 guidance document.³ DWR's guidance document was used by the City to determine the required water use parameters which are discussed below.

WBMWD's 2010 Plan, prepared in June 2011, included regional baselines (historical water use based on average water use in 10-year increments between calendar years 1995 and 2010) and water use targets. The regional 2015 and 2020 targets calculated by WBMWD were 194.1 gallons per capita day and 160.5 gallons per capita day, respectively. Although the City participated in the WBMWD report, the City developed more conservative baselines and targets than those included in the WBMWD 2010 Plan, as described below.

3.2.1 BASELINE DAILY PER CAPITA WATER USE

The Baseline Daily Per Capita Water Use is defined as the average water use, expressed in gallons per capita per day (GPCD), for a continuous, multi-year baseline period. There are two different baseline periods for calculating Baseline Daily Per Capita Water Use, as follows (CWC Sections 10608.20 and 10608.22):

³ California Department of Water Resources, Division of Statewide Integrated Water Management, Water Use and Efficiency Branch. *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. October 1, 2010.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

- *The first baseline period is a continuous 10- to 15-year period, and is used to calculate Baseline Per Capita Water Use per CWC Section 10608.20. The first baseline period is determined as follows:*
 - *If recycled water makes up less than 10 percent of 2008 retail water delivery, use a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*
 - *If recycled water makes up 10 percent or more of 2008 retail water delivery, use a continuous 10- to 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*

The City's recycled water use is less than 10 percent of its 2007-08 retail water delivery as shown in Table 3-3. (Note: The City's water use data are reported on a fiscal year basis. Therefore, fiscal year 2007-08 data is used instead of calendar year 2008, as stated in the CWC.) Consequently, the first baseline period will consist of a continuous 10-year period that can be selected between fiscal year 1995-96 and fiscal year 2009-10 (see Table 3-3).

Table 3-3 Base Period Ranges
(DWR Guidebook Table 13)

Table 13			
Base period ranges			
Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	6,775	<i>acre-feet</i>
	2008 total volume of delivered recycled water	266	<i>acre-feet</i>
	2008 recycled water as a percent of total deliveries	4%	percent
	Number of years in base period ¹	10	years
	Year beginning base period range	1999-00	
	Year ending base period range ²	2008-09	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003-04	
	Year ending base period range ³	2007-08	

Units are in acre-feet per year.

¹ *If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.*

² *The ending year must be between December 31, 2004 and December 31, 2010.*

³ *The ending year must be between December 31, 2007 and December 31, 2010.*

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

- *The second baseline period is a continuous five-year period, and is used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction per CWC Section 10608.22. The continuous five-year period shall end no earlier than December 31, 2007, and no later than December 31, 2010.*

The second baseline period consisting of a continuous five-year period can be selected between 2003-04 and 2009-10.

Unless the urban water retailer's five-year Baseline Daily Per Capita Water Use per CWC Section 10608.12(b)(3) is 100 GPCD or less, Baseline Daily Per Capita Water Use must be calculated for both baseline periods (See Section 3.2.4).

The calculation of the Baseline Daily Per Capita Water Use entails the following four steps:

- Step 1 Calculate gross water use for each year in the baseline period using Methodology 1 in DWR's guidance document. According to Methodology 1, gross water use is a measure of water supplied to the distribution system over 12 months and adjusted for changes in distribution system storage and deliveries to other water suppliers that pass through the distribution system. Recycled water deliveries are to be excluded from the calculation of gross water use. Water delivered through the distribution system for agricultural use may be deducted from the calculation of gross water use. Under certain conditions, industrial process water use also may be deducted from gross water use.*

The City's recorded groundwater production and amount of water purchased from WBMWD are shown on Table 3-4.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 3-4 Historical Potable Water Demands

Calendar Year	Groundwater Production (Acre-Feet)	Purchased Water (Acre-Feet)	Total Potable Water Demand (Acre-Feet)	Total Potable Water Demand (MG)
1995	830	5,559	6,390	5.7
1996	861	5,813	6,674	6.0
1997	1,076	5,821	6,897	6.2
1998	1,151	5,447	6,598	5.9
1999	1,186	5,825	7,011	6.3
2000	974	5,833	6,807	6.1
2001	1,146	5,495	6,641	5.9
2002	1,143	5,675	6,817	6.1
2003	1,201	5,539	6,740	6.0
2004	925	5,981	6,907	6.2
2005	1,283	5,383	6,666	6.0
2006	104	6,704	6,809	6.1
2007	646	5,657	6,303	5.6
2008	1,114	5,395	6,509	5.8
2009	1,932	3,757	5,689	5.1
2010	2,094	3,284	5,378	4.8

The calculated gross water use, based on recorded groundwater use and purchased water, and excluding recycled water use, for each year in the first baseline period is shown on Table 3-5. As discussed previously, because the City's recycled water use is less than 10 percent of its 2007-08 retail water delivery, the first baseline period consists of a continuous 10-year period

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 3-5 Base Daily Per Capita Water Use – 10- to 15-Year Range
(DWR Guidebook Table 14)

Table 14				
Base daily per capita water use — 10- to 15-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	1995	32,885	5.7	173.4
Year 2	1996	33,055	6.0	180.2
Year 3	1997	33,225	6.2	185.3
Year 4	1998	33,397	5.9	176.4
Year 5	1999	33,569	6.3	186.4
Year 6	2000	33,742	6.1	180.1
Year 7	2001	33,883	5.9	175.0
Year 8	2002	34,025	6.1	178.9
Year 9	2003	34,168	6.0	176.1
Year 10	2004	34,311	6.2	179.7
Year 11				
Year 12				
Year 13				
Year 14				
Year 15				
Base Daily Per Capita Water Use¹				179.1

¹ Add the values in the column and divide by the number of rows.

Step 2 Estimate service area population for each year in the baseline period using Methodology 2 in DWR’s guidance document. To obtain an accurate estimate of GPCD, water suppliers must estimate population of the areas that they actually serve, which may or may not coincide with either their jurisdictional boundaries or with the boundaries of cities. According to Methodology 2, data published by the California Department of Finance (DOF) or the U.S. Census Bureau must serve as the foundational building block for population estimates. In some instances, data published by these two sources may be directly applicable. In other instances, additional refinements may be necessary. For example, to account for distribution areas that do not match city boundaries, customers with private sources of supply, or other unique local circumstances, water suppliers may have to supplement the above sources of data with additional local data sources such as county assessor data, building permits data, and traffic analysis zone data. These refinements are acceptable as long as they are consistently applied

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

over time, and as long as they build upon population data sources of the DOF or the U.S Census Bureau.

The City's service area population for each year in the baseline period is based on DOF data (see Table 3-5).

Step 3 Calculate daily per capita water use for each year in the baseline period. Divide gross water use (determined in Step 1) by service area population (determined in Step 2).

The calculated daily per capita water use for each year in the baseline period is shown on Table 3-5.

Step 4 Calculate Baseline Daily Per Capita Water Use. Calculate average per capita water use by summing the values calculated in Step 3 and dividing by the number of years in the baseline period. The result is Baseline Daily Per Capita Water Use for the selected baseline period.

The Baseline Daily Per Capita Water Use for the City was determined to be **179.1 GPCD**, based on the highest calculated average for a continuous 10-year period (first baseline period) between fiscal year 1995-96 and fiscal year 2009-10 (see Table 3-5).

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

3.2.2 URBAN WATER USE TARGET

Section 10608.20 (b)

An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

- (1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.*
- (2) The per capita daily water use that is estimated using the sum of the following performance standards:*
 - (A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.*
 - (B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.*
 - (C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.*
- (3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.*
- (4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:*
 - (A) Consider climatic differences within the state.*
 - (B) Consider population density differences within the state.*
 - (C) Provide flexibility to communities and regions in meeting the targets.*
 - (D) Consider different levels of per capita water use according to plant water needs in different regions.*
 - (E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.*
 - (F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.*

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

The Urban Water Use Target is determined using one of the following methods:

Method 1: Eighty percent of the urban retail water supplier's Baseline Per Capita Daily Water Use.

Using this method, the Urban Water Use Target for the City was calculated as 143.3 GPCD, based on the City's Baseline Per Capita Daily Water Use of 179.1 GPCD.

Method 2: Estimate using the sum of the specified three performance standards.

Although this method was reviewed, this method was not considered due to insufficient data (i.e. total landscaped area within the City and commercial, industrial, and institutional water use for each year during the 1995 to 2010 period).

Method 3: Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's 20x2020 Water Conservation Plan.⁴

Based on the 20x2020 Water Conservation Plan⁴, which was prepared in response to SBX7-7, the City's service area lies in DWR Hydrologic Region 4 (South Coast), with an established Baseline Per Capita Daily Water Use of 180 GPCD and a Target Per Capita Daily Water Use of 149 GPCD. Using this method, the Urban Water Use Target for the City was calculated as 142 GPCD.

⁴ California Department of Water Resources, State Water Resources Control Board, California Bay-Delta Authority, California Energy Commission, California Department of Public Health, California Public Utilities Commission, and California Air Resources Board. *20x2020 Water Conservation Plan*. February 2010.

Method 4: *Water Savings.*

Although this method was reviewed, this method was not considered due to insufficient data (i.e. historical indoor residential water savings and commercial, industrial, and institutional water use for each year during the 1995 to 2010 period).

Based on the requirements in Section 10608.20 to adopt one of four methods, the City's Urban Water Use Target was determined to be 143.3 GPCD for 2020, based on Method 1 above (note: this value is required to meet the legislation's minimum water use reduction requirement discussed in Section 3.2.4 below) and represents the highest of the methods available for selection.

3.2.3 COMPLIANCE DAILY PER CAPITA WATER USE

Compliance Daily Per Capita Water Use is defined as the Gross Water Use during the final year of the reporting period (years for which the City reports compliance with the urban water use targets), and reported in GPCD. The Compliance Daily Per Capita Water Use will be reported in the City's 2015 Plan (interim compliance) and 2020 Plan (final compliance).

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

3.2.4 MINIMUM WATER USE REDUCTION REQUIREMENT

Section 10608.22

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

The following calculation is made because the five-year Baseline Per Capita Water Use per CWC Section 10608.12(b)(3) is greater than 100 GPCD, as noted in Section 3.2.1. (The City's five-year Baseline Per Capita Water Use of 173.2 GPCD is calculated in Step 1 below). The calculation is used to determine whether the water supplier's 2015 and 2020 per capita water use targets meet the legislation's minimum water use reduction requirement per CWC Section 10608.22. The calculation entails three steps:

Step 1: Calculate Baseline Daily Per Capita Water Use using a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

This value was calculated as 173.2 GPCD (see Table 3-6).

Table 3-6 Base Daily Per Capita Water Use – 5-Year Range
(DWR Guidebook Table 15)

Table 15				
Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2003	34,168	6.0	176.1
Year 2	2004	34,311	6.2	179.7
Year 3	2005	34,454	6.0	172.7
Year 4	2006	34,599	6.1	175.7
Year 5	2007	34,744	5.6	161.9
Base Daily Per Capita Water Use¹				173.2

¹ Add the values in the column and divide by the number of rows.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

Step 2: Multiply the result from Step 1 by 0.95. The 2020 per capita water use target cannot exceed this value (unless the water supplier's five-year Baseline Per Capita Water Use is 100 GPCD or less). If the 2020 target is greater than this value, reduce the target to this value.

This value was calculated as 164.6 GPCD. The City's 2020 Urban Water Use Target was determined using Method 1 above to be 143.3 GPCD, which is lower than the value calculated in this step. Therefore, no adjustment is needed for the City's 2020 Urban Water Use Target of 143.3 GPCD.

Step 3: Set the 2015 target to mid-point between the 10- or 15-year Baseline Per Capita Water Use and the 2020 target determined in Step 2.

The City's 2015 Interim Urban Water Use Target is therefore set at 161.2 GPCD.

Therefore, the City's 2020 Urban Water Use Target of **143.3 GPCD** and 2015 Interim Urban Water Use Target of **161.2 GPCD** meet the legislation's minimum water use reduction requirement per CWC Section 10608.22.

3.2.5 PROGRESS REPORT

10608.40.

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

The City will report to DWR on its progress in meeting its urban water use targets, using a standardized form to be developed by DWR, as part of the City's 2015 Plan Update.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

3.3 WATER DEMAND PROJECTIONS

Section 10631(k)

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

Undeveloped residentially zoned land in the City of Manhattan Beach is almost non-existent. Commercial, industrial and institutional accounts are expected to only increase slightly over the next 20 years.

The City's projected water demands (see Table 3-7) are calculated based on the urban per capita water use target developed per SBX7-7 (see Section 3.2 above) and population projections (see Table 2-6). The projected water use and the number of service connections by customer type estimated to the year 2030 are shown on Tables 3-8 through 3-10.

**Table 3-7 Calculation of Projected Water Demand
(Acre-feet)**

Calendar Year	Projected Population ⁽¹⁾	Urban Water Use Target (GPCD) ⁽²⁾	Projected Water Demand ⁽³⁾
2015	36,042	161.2	6,510
2020	36,924	143.3	5,928
2025	37,097	143.3	5,956
2030	37,270	143.3	5,984

⁽¹⁾ See Table 2-6

⁽²⁾ See Section 3.1 for urban water use target

⁽³⁾ (Projected population) x (Urban Water Use Target)

GPCD = gallons per capita per day

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 3-8 Water Deliveries – Projected, 2015
(DWR Guidebook Table 5)

Table 5 Water deliveries — projected, 2015					
Water use sectors	2015				Total Volume
	Metered		Not metered		
	# of accounts	Volume	# of accounts	Volume	
Single family	11,869	4,156			4,156
Multi-family	1,281	435			435
Commercial / Institutional	535	776			776
Industrial	125	455			455
Landscape	125	152			152
Agriculture					0
Other					0
Total	13,935	5,974	0	0	5,974

Units are in acre-feet per year.

Table 3-9 Water Deliveries – Projected, 2020
(DWR Guidebook Table 6)

Table 6 Water deliveries — projected, 2020					
Water use sectors	2020				Total Volume
	Metered		Not metered		
	# of accounts	Volume	# of accounts	Volume	
Single family	12,159	3,768			3,768
Multi-family	1,311	394			394
Commercial / Institutional	550	703			703
Industrial	5	413			413
Landscape	130	138			138
Agriculture					0
Other					0
Total	14,155	5,417	0	0	5,417

Units are in acre-feet per year.

Table 3-10 Water Deliveries – Projected, 2025 and 2030
(DWR Guidebook Table 7)

Table 7 Water deliveries — projected 2025, 2030, and 2035						
Water use sectors	2025		2030		2035 - optional	
	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family	12,214	3,787	12,269	3,805	--	--
Multi-family	1,316	396	1,321	398	--	--
Commercial / Institutional	555	707	560	710	--	--
Industrial	5	415	5	417	--	--
Landscape	130	138	130	139	--	--
Agriculture					--	--
Other					--	--
Total	14,220	5,443	14,285	5,470	0	0

Units are in acre-feet per year.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

The City does not sell water to other agencies. Although the City can provide water for emergency purposes through its two emergency interconnections with adjacent water agencies (California Water Service Company and the City of El Segundo), the City does not project water sales to other agencies (See Table 3-11).

Table 3-11 Sales to Other Water Agencies

(DWR Guidebook Table 9)

Table 9 Sales to other water agencies							
Water distributed	2005	2010	2015	2020	2025	2030	2035 - opt
California Water Service Company (emergency use)	0	0	0	0	0	0	--
City of El Segundo (emergency use)	0	0	0	0	0	0	--
Total	0						

Units are in acre-feet per year.

The City's past, current, and projected recycled water use and unaccounted for system losses are shown on Table 3-12.

Table 3-12 Additional Water Uses and Losses

(DWR Guidebook Table 10)

Table 10 Additional water uses and losses							
Water use ¹	2005	2010	2015	2020	2025	2030	2035 -opt
Saline barriers	0	0	0	0	0	0	--
Groundwater recharge	0	0	0	0	0	0	--
Conjunctive use	0	0	0	0	0	0	--
Raw water	0	0	0	0	0	0	--
Recycled water	254	263	280	280	280	280	--
System losses	273	221	255	232	233	234	--
Other (define)	0	0	0	0	0	0	--
Total	527	484	535	512	513	514	--

Units are in acre-feet per year.

¹ Any water accounted for in Tables 3 through 7 are not included in this table.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

The City's past, current, and projected total water use is summarized on Table 3-13.

Table 3-13 Total Water Use
(DWR Guidebook Table 11)

Table 11 Total water use							
Water Use	2005	2010	2015	2020	2025	2030	2035 - opt
Total water deliveries (from Tables 3 to 7)	6,393	5,158	5,974	5,417	5,443	5,470	--
Sales to other water agencies (from Table 9)	0	0	0	0	0	0	--
Additional water uses and losses (from Table 10)	527	484	535	512	513	514	--
Total	6,920	5,641	6,510	5,928	5,956	5,984	0

Units are in acre-feet per year.

The City relies on WBMWD for imported water supplies (as discussed in Section 4.0). The City's projected water demands from WBMWD are provided in Table 3-14. The City notified WBMWD of the development of its 2010 Plan and made a copy of the draft Plan available to WBMWD. WBMWD in turn provided the City with a copy of their Final 2010 Plan, which is incorporated by reference in this Plan.

Table 3-14 Retail Agency Demand Projections Provided to Wholesale Suppliers
(DWR Guidebook Table 12)

Table 12 Retail agency demand projections provided to wholesale suppliers							
Wholesaler	Contracted Volume ³	2010	2015	2020	2025	2030	2035 -opt
West Basin Municipal Water District	0	3,284	5,099	4,517	4,545	4,572	--

Note: The City leased 1,051 AF of West Coast Basin groundwater rights in 2010, reducing the amount of imported water purchases from WBMWD. For the purposes of this table, the City will rely on imported water purchases from WBMWD, instead of water rights leases, to meet water demands from 2015 to 2035.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

3.3.1 PROJECTED WATER DEMAND FOR LOWER INCOME HOUSEHOLDS

Section 10631.1(a)

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

Based on information from the City's Draft Housing Element, prepared October 2008, lower income households represent approximately ten percent of the City's total number of households. Based on a ten percent use factor of total residential water demands, the projected water demand for lower income households is about 406 acre-feet per year by the year 2030, as shown on Table 3-15.

Table 3-15 Low-Income Projected Water Demands
(DWR Guidebook Table 8)

Table 8 Low-income projected water demands					
Low Income Water Demands¹	2015	2020	2025	2030	2035 - opt
Single-family residential	416	377	379	381	
Multi-family residential	43	39	40	40	
Total	459	416	418	420	

*Units are in acre-feet per year.
¹ Provide demands either as directly estimated values or as a percent of demand.*

3.4 WATER USE REDUCTION PLAN

10608.36.

Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

The City is not an urban wholesale water supplier. Therefore, the requirement for an urban wholesale water supplier to provide an assessment of its present and proposed future measures, programs, and policies to help achieve the water use reductions required is not applicable to the City.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

**SECTION 4
SYSTEM SUPPLIES**

4.1 WATER SOURCES

Section 10631

A plan shall be adopted in accordance with this chapter and shall do the following:

- b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

The City's water supply sources include groundwater pumped from the West Coast Basin, imported water purchased from WBMWD, and recycled water purchased from WBMWD. The City's past, current, and projected water supplies are shown on Table 4-1. The City's main source of water supply is imported water purchased from WBMWD.

Table 4-1 Water Supplies – Current and Projected
(DWR Guidebook Table 16)

Table 16 Water supplies — current and projected							
Water Supply Sources		2010	2015	2020	2025	2030	2035 - opt
Water purchased from ¹ :	Wholesaler supplied volume (yes/no)						
West Basin Municipal Water District	no	3,284	5,099	4,517	4,545	4,572	--
(Not applicable)							--
(Not applicable)							--
Supplier-produced groundwater ²		2,094	1,131	1,131	1,131	1,131	--
Supplier-produced surface water		0	0	0	0	0	--
Transfers in		0	0	0	0	0	--
Exchanges In		0	0	0	0	0	--
Recycled Water		263	280	280	280	280	--
Desalinated Water		0	0	0	0	0	--
Other		--	--	--	--	--	--
Other		--	--	--	--	--	--
Total		5,641	6,510	5,928	5,956	5,984	

Units are in acre-feet per year.

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

² *Volumes shown here should be consistent with Tables 17 and 18.*

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Groundwater

The City pumps groundwater from the West Coast Basin from two (2) active wells (Well 11A and Well 15). These wells have a combined production capacity of approximately 3,100 gallons per minute (or approximately 5,000 acre-ft per year based on continuous operations). The Court adjudication of the West Coast Basin in 1961 has provided groundwater management that allows operation of basin storage to meet a portion of overlying water demands. According to the West Coast Basin Judgment, the City has an adjudicated pumping right of 1,131.2 acre-feet per year, as of fiscal year 2009-10. The West Coast Basin Judgment allows Parties to the Judgment to pump up to 20 percent more of its annual entitlement, or carry-over up to 20 percent of its annual entitlement in any given year. As a result of the Judgment, DWR was appointed as Watermaster to account for all water rights and groundwater extraction amounts each year.

Treated Imported Surface Water

The City maintains a connection with WBMWD, designated WB-04, to receive treated imported surface water. The capacity of this connection is 15 cubic feet per second. A summary of the City's current and projected wholesale water supplies is provided in Table 4-2.

Table 4-2 Wholesale Supplies – Existing and Planned Sources of Water
(DWR Guidebook Table 17)

Table 17 Wholesale supplies — existing and planned sources of water						
Wholesale sources^{1,2}	Contracted Volume³	2015	2020	2025	2030	2035 - opt
West Basin Municipal Water District	0	5,099	4,517	4,545	4,572	--

Units are in acre-feet per year.

¹ Water volumes presented here should be accounted for in Table 16.

² If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier, if more than one.

³ Indicate the full amount of water

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

Recycled Water

The City of Manhattan Beach receives recycled water from WBMWD. WBMWD's source of recycled water supply is treated wastewater effluent from the City of Los Angeles's Hyperion Wastewater Treatment Plant. Treated wastewater effluent is pumped to WBMWD's main treatment facility, the Edward C. Little Water Recycling Facility. Since 1995, the City has purchased an average of 269 AFY of recycled water from WBMWD. Over the past ten years, the amount of recycled water used by the City averaged 278 AFY, reflecting the general increase in recycled water use in the City over the past several years. Recycled water within the City's service area is currently being used for irrigation of greenbelt areas, landscape medians, parks, golf courses, and schools. Use of recycled water allows the City to reduce the amount of purchase of imported water supplies through the WBMWD.

Additional discussion of recycled water uses within the City's service area is provided in Section 4.5.

Total Water Supplies

The City's current and projected water supplies from groundwater, imported surface water, and recycled water are shown in Table 4-1. Table 5-11 and Table 5-12 provide the City's projected water supplies during future single and multiple dry year conditions, respectively.

4.2 GROUNDWATER

Section 10631(b)

If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

As indicated in Section 4.1, the City currently has two (2) active wells located in the West Coast Basin (Well 11A and Well 15). These wells are located within the West Coast Basin and have a combined production capacity of approximately 3,100 gallons per minute (or approximately 5,000 acre-ft per year based on continuous operations).

4.2.1 GROUNDWATER MANAGEMENT

Section 10631(b)

If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

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

4.2.1.1 WEST COAST BASIN GROUNDWATER MANAGEMENT PLAN

Groundwater production in West Coast Basin is restricted to adjudicated rights fixed by the West Coast Basin Judgment and managed by a court-appointed Watermaster. The City's adjudicated rights to the West Coast Basin are provided in the Judgment. The following section provides a historical overview based on the West Coast Basin Watermaster 2010 Annual Report.

WEST COAST BASIN JUDGMENT

During the 1930's and 1940's declining groundwater levels permitted sea water to intrude into the West Basin. A complaint was filed in 1945 with the Superior Court by the California Water Service Company, City of Torrance, and the Palos Verdes Water Company on behalf of themselves and others against 151 defendants, as a result of

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

declining water levels. The suit was filed to quiet title to the groundwater rights of each pumper and to reduce groundwater extractions from the Basin so that the supply would not be further depleted or degraded. The long period of time anticipated before final adjudication prompted certain parties to execute an Interim Agreement to reduce extractions and preserve all rights of the parties during litigation. The Court was asked to make that agreement an ex parte order and to appoint a Watermaster. In February 1955, the Court appointed DWR, as Watermaster.

The West Basin Water Association was created in 1946. The West Basin Water Association sponsored a committee of legal advisors, representing the major groundwater producers, in order to hasten the completion of litigation. Parties representing over 80 percent of the total water rights signed the Stipulation for Judgment. The Judgment, defining the decreed rights of the parties, was approved by the Court on August 18, 1961, after 16 years of litigation. The Court then terminated Watermaster service under the Interim Agreement and reappointed the DWR as Watermaster pursuant to the Judgment.

A second West Basin water right suit, entitled “Judgment No. 668965, Dominguez Water Corporation, et al., vs. American Plant Growers, Incorporated, et al.” filed on October 31, 1956, with the Superior Court, Los Angeles County, was initiated to obtain Court jurisdiction over producers who had been missed in the earlier action and those who began pumping after the filing of the original action. Judge George Francis, who presided over the original West Basin suit, also presided over the second suit, and approved and signed the Judgment on March 24, 1966.

Adjudication of the West Coast Basin limited the allowable annual extraction of groundwater in order to prevent seawater intrusion and unhealthy groundwater levels. The West Coast Basin Judgment capped annual production at 64,468.25 AFY. According to WRD’s “Engineering and Survey Report, 2011”, the Judgment currently allows annual carryover of unused water rights of up to 20 percent. The Judgment also

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

allows up to an additional 10,000 acre-feet of emergency pumping over a four (4) month period in the West Coast Basin under specified conditions. As of 2010, the City has an adjudicated right of 1,130.20 from the West Coast Basin.

The West Coast Basin Judgment contains provisions for the Parties to obtain additional pumping rights exceeding their entitled extractions. There is a voluntary Exchange Pool in which recipients of Exchange Pool water may pump the amounts released to them in addition to their adjudicated right. The amounts that parties may release are limited by the Judgment. Adjudicated rights may also be transferred through a lease or sale agreement. DWR maintains a list of parties who are interested in buying, selling, or leasing water rights. A copy of the West Coast Basin Judgment is provided in Appendix F.

4.2.2 DESCRIPTION OF GROUNDWATER BASIN

Section 10631(b)(2)

A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

DESCRIPTION OF WEST COAST BASIN GROUNDWATER BASIN

The City has two (2) active wells (Well 11A and Well 15) that extract water from the West Coast Basin, which underlies approximately 160 square miles of the southwestern portion of the Los Angeles Coastal Plain. The West Coast Basin is bounded by the Ballona Escarpment to the north, the Newport-Inglewood Uplift to the east, the Santa Monica Bay to the west, and San Pedro Bay and the Palos Verdes Hills

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

to the south. The major source of natural recharge to the West Basin is subsurface flow from the Central Basin.

The major aquifers identified in West Coast Basin include the following: a) the Semiperched, Bellflower, Gaspar, and Gardena aquifers of the Holocene Alluvium Formation; b) the Gage aquifer of the Pleistocene Lakewood Formation; and c) the Lynwood, Silverado, and unnamed aquifers of the Lower Pleistocene San Pedro Formation. General regional groundwater flow is southward and westward from the Central Coastal Plain toward the ocean. According to WRD's "Regional Groundwater Monitoring Report Water Year 2009-2010", groundwater levels in the West Coast Basin, including the Silverado aquifer, have generally increased over the past 10 years. Hydrographs of West Coast Basin wells are provided in See Appendix G.

The City extracts water from the Silverado aquifer of the West Coast Basin. According to DWR's Bulletin 118 (See Appendix H) the Silverado aquifer is the most productive aquifer in the West Coast Basin and yields 80 to 95 percent of the West Coast Basin's groundwater. The storage capacity of the Silverado aquifer is estimated at approximately 6,500,000 acre-feet.

According to DWR's Bulletin 118, natural replenishment of the West Coast Basin's groundwater supply is largely limited to underflow from the Central Basin through and over the Newport-Inglewood fault zone. Water spread (a process in which water is directed into the ground, by spreading on the surface, to replenish a groundwater basin) in the Central Basin percolates into aquifers and a portion crosses the Newport-Inglewood fault to supplement the groundwater supply in the West Coast Basin. Injection wells in the West Coast Basin Barrier create a north-south trending mound of fresh water from Los Angeles International Airport to the Palos Verdes Hills. Injection wells also form a protective mound at the Dominguez Gap Barrier. These two injection projects consist of series of wells injecting fresh and recycled water into the groundwater to recharge the basin and reduce seawater intrusion. In addition, minor

replenishment to the West Coast Basin occurs from infiltration of surface inflow from both the Los Angeles and San Gabriel Rivers into the uppermost aquifers and from return irrigation water from fields and lawns, industrial waters, and other applied surface waters.

4.2.3 LOCATION, AMOUNT AND SUFFICIENCY OF GROUNDWATER PUMPED FOR THE PAST FIVE YEARS

Section 10631(b)(3)

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

The City produces groundwater through its two (2) active wells in the West Coast Basin, as discussed in Section 4.1. The City's historical groundwater production in the West Coast Basin over the past 15 years is shown on Table 3-4. According to the West Coast Basin Judgment, the City has an adjudicated right of 1,131.20 acre-feet each year from the West Coast Basin as of 2010. Groundwater management practices have allowed the City to historically be able to produce groundwater from the West Coast Basin in addition to its adjudicated right. As discussed above, the West Coast Basin Judgment allows the City to exceed its adjudicated right by up to 20 percent in any year. The West Coast Basin Judgment also allows the City to carryover up to 20 percent of its water rights from the previous year. In addition, the City is allowed to lease West Coast Basin water rights from other West Coast Basin producers. The City typically leases water from other West Coast Basin purveyors on an annual basis in order to reduce the purchase of more expensive imported water. Over the past ten years (fiscal year 2000-01 to fiscal year 2009-10), the City has had an average carryover right of approximately 167 acre-feet per year and has leased an average of approximately 567 acre-feet per year. The City's groundwater production from the West Coast Basin over the past five years, from 2006 to 2010, is provide in Table 4-3 and has averaged approximately 1,178 AFY.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 4-3 Groundwater – Volume Pumped
(DWR Guidebook Table 18)

Table 18 Groundwater — volume pumped						
Basin name(s)	Metered or Unmetered ¹	2006	2007	2008	2009	2010
West Coast Basin	Metered	104	646	1,114	1,932	2,094
Total groundwater pumped		104	646	1,114	1,932	2,094
Groundwater as a percent of total water supply		1.5%	9.8%	16.4%	32.5%	37.1%

Units are in acre-feet per year.
¹ Indicate whether volume is based on volumetric meter data or another method

The successful management of West Coast Basin groundwater supplies by the West Coast Basin Judgment resulted in recovery of water levels in wells throughout the West Coast Basin. As shown in Appendix G, water levels have been increasing despite several drought periods. **Therefore, based on historical and on-going management practices, the City will be able to rely on the West Basin for adequate supply over the next 20 years under single year and multiple year droughts.**

4.2.4 LOCATION AND AMOUNT OF GROUNDWATER PROJECTED TO BE PUMPED

Section 10631(b)(4)

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

The successful management of West Coast Basin groundwater supplies by the West Coast Basin Judgment resulted in recovery of water levels in wells throughout the West Coast Basin. **Therefore, based on historical and on-going management practices, the City will be able to rely on the West Coast Basin for adequate supply over the next 20 years under single year and multiple year droughts.** A summary of the City’s current and projected groundwater production from the West Coast Basin is provided in Table 4-4.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 4-4 Groundwater – Volume Projected to be Pumped
(DWR Guidebook Table 19)

Table 19 Groundwater — volume projected to be pumped					
Basin name(s)	2015	2020	2025	2030	2035 - opt
West Coast Basin	1,131	1,131	1,131	1,131	--
Total groundwater pumped	1,131	1,131	1,131	1,131	--
Percent of total water supply	17.4%	19.1%	19.0%	18.9%	--

*Units are in acre-feet per year.
Include future planned expansion*

4.3 TRANSFER OPPORTUNITIES

Section 10631(d)

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

The City’s short-term and long-term water transfer opportunities, or water exchanges, are described below and are summarized in Table 4-5.

Table 4-5 Transfer and Exchange Opportunities
(DWR Guidebook Table 20)

Table 20 Transfer and exchange opportunities			
Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
City of El Segundo	Transfer	Short Term	0
California Water Service Company	Transfer	Short Term	0
West Coast Basin Producers	Transfer	Long Term	0
Total			0

Units are in acre-feet per year.

4.3.1 SHORT-TERM

The City maintains emergency interconnections with adjacent water agencies. Two of the interconnections (City of El Segundo and California Water Service Co.) are equipped with two-way valves, which have the ability of providing water both to and

from the City. An additional interconnection (City of El Segundo) has the ability of providing water to the City. The total capacity to the City from these three emergency interconnections is approximately 23 cubic feet per second.

4.3.2 LONG-TERM

As discussed in Section 4.2.3, the City typically leases water from other West Coast Basin purveyors on an annual basis in order to reduce the purchase of more expensive imported water. Leasing is the City's most common form of transfer and the City has leased an average of approximately 567 acre-feet per year from fiscal year 2000-01 to fiscal year 2009-10. In addition to leases, the City aggressively pursues purchase of additional water rights as they become available.

In addition, WBMWD describes transfer opportunities within its 2010 Plan (See Appendix I, Section 4.4). As a member agency to WBMWD, the City may benefit from these water transfer opportunities.

4.4 DESALINATED WATER OPPORTUNITIES

Section 10631(i)

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

WBMWD completed the C. Marvin Brewer Desalter facility in the early 1990s as a demonstration project for removing and treating brackish water using two existing drinking water wells impacted by the seawater intrusion. In 2005, the two wells were replaced with a new, more productive well with the capability to pump 1,600 to 2,400 acre-feet per year of brackish ground water (to be treated at the desalting facility for use by WBMWD's customers).

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

WBMWD has been actively researching the feasibility of an ocean water desalination program to produce drinking water supply. From 2002 to 2009, West Basin operated the Desalination Pilot Project, which incorporated microfiltration as a pretreatment to reverse osmosis for ocean-water desalination. To ensure effective treatment of ocean water, WBMWD performed extensive water quality research at the pilot plant. The water produced at the pilot project consisted of approximately 350 parts per million (ppm) of Total Dissolved Solids (TDS) meeting current State and Federal drinking water standards set by the California Department of Public Health (CDPH) and the United States Environmental Protection Agency (EPA). The research and testing conducted at the Pilot Project was used to design of the Ocean-Water Desalination Demonstration Facility, dedicated in November 2010. The Demonstration Facility will be operational for a minimum of two years while WBMWD evaluates the feasibility of permitting and siting of a full-scale desalination plant capable of providing 20,000 acre-feet per year of potable water. WBMWD anticipates construction of the full-scale plant by 2017. Potable water produced from the full-scale desalination plant can potentially be supplies to local and regional agencies, including the City. An additional discussion on WBMWD's desalination efforts is provided in WBMWD's 2010 Plan (See Appendix I, Section 10)

4.5 RECYCLED WATER OPPORTUNITIES

4.5.1 RECYCLED WATER AND POTENTIAL FOR USE

Section 10633

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

As a member of WBMWD, the City purchases recycled water for use within its service area. The City has been an active participant in the use of recycled water since it became available from WBMWD in 1995 and continues to explore future uses of recycled water within its service area.

To encourage customers to convert to recycled water, the City of Manhattan Beach in conjunction with the WBMWD agreed to sell recycled water at a discounted rate. The recycled water is purchased from West Basin Municipal Water District's Water Reclamation Facility located in El Segundo. Since 2001, the City has purchased an average of 278 acre-feet per year of recycle water from WBMWD. Recycled water is currently being used for irrigation of greenbelt areas, landscape, medians, parks, schools, and a golf course. A map of the City's recycled water distribution System is provided in Appendix J.

4.5.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

Section 10633

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*
- (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

According to the City's "2010 Wastewater Master Plan", the City's existing wastewater collection system consists of approximately 81.6 miles of pipe and 2,086 manholes and cleanouts. The system also includes eight pump stations and 5,114 feet of associated forcemains. The City's wastewater system is primarily constructed of vitrified clay pipe with sizes ranging from 6-inches to 21-inches in diameter. Approximately 78 percent of the pipes are 8-inches in diameter. The majority of the City's wastewater system was constructed between 1920 and 1960.

The City's local sewers tie into one of the Los Angeles County Sanitation District (LACSD) regional trunk sewers crossing through the City. Wastewater is then transported to LACSD's Joint Water Pollution Control Plant (JWPCP) in the City of Carson for treatment. The JWPCP is located in the southwest corner of City of Carson just east of I-110 freeway. The City is a part of LACSD's South Bay Cities District.

There are two primary LACSD trunk sewers within the City. The first trunk runs northwest to southeast and parallels The Strand along the beachfront. The second trunk runs west to east and is located in 26th Place, Bell Avenue, 25th Street and Marine Avenue. Pacific Avenue Pump Station, Palm Avenue Pump Station, Poinsettia Avenue Pump Station, Meadows Avenue Pump Station and Voorhees Avenue Pump Station are tributary to this trunk sewer.

LACSD's JWPCP, which began operation in 1928, currently has a treatment capacity of about 300 MGD. The treatment level is primary and secondary treatment with disinfection. The JWPCP plant serves a population of approximately 3.5 million people. The JWPCP produced 280.47 MGD (283,285 acre-feet per year) of disinfected secondary water in fiscal year 2009-10. The volume of wastewater collected and treated is shown in Table 4-6. Solids collected in primary and secondary treatment are processed in anaerobic digestion tanks where bacteria break down organic material and produce methane gas. Following digestion, the solids are dewatered and hauled off-site for use in composting, land application, or combined with municipal solid waste for co-

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

disposal. The methane gas generated in the anaerobic digestion process is used to produce power and digester heating steam in a combined cycle power plant that utilizes gas turbines and waste-heat recovery steam generators. Due to the onsite generation of power, the JWPCP is self-sufficient with respect to energy requirements. Treated wastewater is ultimately disinfected prior to being sent to the Pacific Ocean through a network of outfalls (see Table 4-7). The outfalls extend two miles off the coast of Southern California into the Palos Verdes Peninsula to a depth of 200 ft. Though highly treated, effluent from the JWPCP does not meet recycled water standards and is therefore not re-used for such purposes. However, all water discharged to the ocean is monitored to ensure compliance with applicable local, state, and federal standards for discharge water.

According to the City's 2010 Wastewater Master Plan, the total existing average wastewater generated within the City is approximately 3.0 million gallons per day (MGD), or approximately 84 gallons per day (gpd) per person based on a 2010 population of 35,182. Typically, total wastewater generation per person averages 100 gpd. The lower value of 84 gpd per person can be attributed to the fact that 70 percent of the City's land use is residential, which is greater than most southern California cities. Water conservation efforts can also affect lower wastewater generation.

Table 4-6 Recycled Water – Wastewater Collection and Treatment
(DWR Guidebook Table 21)

Table 21 Recycled water — wastewater collection and treatment							
Type of Wastewater	2005	2010	2015	2020	2025	2030	2035 - opt
Wastewater collected & treated in service area	363,498	314,284	339,000	339,000	339,000	339,000	--
Joint Water Pollution Control Plant	363,498	314,284	339,000	339,000	339,000	339,000	--
Volume that meets recycled water standard ¹	0	0	0	0	0	0	--

Units are in acre-feet per year.
¹ Based on flow from the Los Coyotes Water Reclamation Plant

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 4-7 Non-Recycled Wastewater Disposal
(DWR Guidebook Table 22)

Table 22 Recycled water — non-recycled wastewater disposal							
Method of disposal	Treatment Level	2010	2015	2020	2025	2030	2035 - opt
Ocean Discharge (JWPCP)	Secondary	NA	NA	NA	NA	NA	--
Total		-	-	-	-	-	-

(Note: All of the City's wastewater is treated at the JWPCP. However, the City receives recycled water from the City of Los Angeles Hyperion Wastewater Treatment Plant, through WBMWD)

Units are in acre-feet per year.

4.5.3 CURRENT RECYCLED WATER USE

Section 10633

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

WBMWD's source of recycled water supply is treated wastewater effluent from the City of Los Angeles's Hyperion Wastewater Treatment Plant, located adjacent to WBMWD' service area. The City of Los Angeles has operated Hyperion since 1894. Hyperion has been upgraded over the years to full secondary treatment. Hyperion's full treatment capacity is 450 to 850 MGD and secondary treatment capacity is 450 MGD.

According to WBMWD's "Capital Implementation Master Plan for Recycled Water Systems", June 2009, secondary effluent from Hyperion is pumped from WBMWD's Hyperion Secondary Effluent Pump Station to WBMWD's main treatment facility, the Edward C. Little Water Recycling Facility (ELWRF), located in El Segundo. The ECLWRF has a current capacity of 62,700 acre-feet per year and has been in continuous operation since 1995. Recycled water produced from ELWRF is conveyed through approximately 100 miles of distribution pipelines ranging in diameter from 4 to 60 inches.

According to WBMWD's 2010 Plan, the City of Los Angeles strives to provide West Basin with a consistent quality of secondary treated wastewater. However, the ECLWRF has to accommodate inevitable fluctuations in influent quality. Most of WBMWD's recycled water is treated to meet California Code of Regulations Title 22

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

(Title 22) tertiary standards. Title 22 addresses specific treatment requirements for recycled water and lists approved uses. Approximately 2,000 tests are performed monthly at the ECLWRF to ensure water quality meets or exceed all State and Federal requirements.

Recycled water produced from WBMWD’s ECLWRF is sold to the City. Since 1995, the City has purchased an average of approximately 270 acre-feet per year of recycled water from WBMWD. The City’s historical recycled water usage is provided in Table 4-1. Table 4-8 summarizes the City’s current recycled water users, location, and approximate annual capacities. Table 4-9 compares recycled water use projections for 2010 from the City’s 2005 Plan to actual 2010 recycled water use.

Table 4-8 Capacities of Recycled Water Users

User Name	Use (AFY)	User Name	Use (AFY)
Mira Costa High School	38	Meadows Elementary School	6
Polliwog Park	33	Valley/Ardmore Greenbelt @ 8th St	5
Marine Avenue Park	19	Marine & Sepulveda Median	4
Grandview Elementary / Ladera	18	Marine Avenue Median	4
Pennekamp Elementary School	18	MB Fire & Police Landscape	4
Sports Park	15	Valley/Ardmore Greenbelt @ 15th St	3
Mar Brad Middle School - La Marina Field	14	Live Oak Park	2
Valley/Ardmore Greenbelt @ 19th St	14	Marine & Herrin Median	2
Manhattan Studios	12	MB Unified School District Admin	2
MB Middle School (Bell Ave South of Park)	12	Rosecrans Medians @ Pine	2
Manhattan Village Park	10	Marine Triangle Median	1
Marine Avenue Median	10	1508 Aviation	0.4
Valley/Ardmore Greenbelt @ 2nd	10	2202 Aviation	0.5
Valley/Ardmore Greenbelt @ Ardmore	9	Dorsey Field	8
Begg Elementary School	7	Voorhees Sump	0.6
Robinson Elementary School	7	Marriott Golf Course	44
Valley/Ardmore Greenbelt @ M.B.B.S.	7		
Total			341.5

AFY = Acre-Feet Pear Year

Source: City of Manhattan Beach 2010 Water Master Plan

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

**Table 4-9 2005 UWMP Use Projection Compared to 2010 Actual
(DWR Guidebook Table 24)**

Table 24 Recycled water — 2005 UWMP use projection compared to 2010 actual		
Use type	2010 actual use	2005 Projection for 2010¹
Agricultural irrigation	--	--
Landscape irrigation ²	219	256
Commercial irrigation ³	--	--
Golf course irrigation	44	44
Wildlife habitat	--	--
Wetlands	--	--
Industrial reuse	--	--
Groundwater recharge	--	--
Seawater barrier	--	--
Geothermal/Energy	--	--
Indirect potable reuse	--	--
Other (user type)	--	--
Other (user type)	--	--
Total	263	300

Units are in acre-feet per year.

¹ From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.

² Includes parks, schools, cemeteries, churches, residential, or other public facilities)

³ Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Recycled water is currently being used for irrigation of greenbelt areas, landscape, medians, parks, schools, and a golf course. Subsequently, recycled water demand in any particular year is highly dependent on precipitation. This is particularly evident in the reduction of recycled water demand during calendar year 2005 for example, which was characterized by larger than average annual precipitation. Regardless of the yearly fluctuations resulting from varying rainfall totals, the overall trend of recycled water demand is expected to remain relatively steady over the next 20 years.

4.5.4 POTENTIAL USES OF RECYCLED WATER

Section 10633

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

Recycled water is currently being used for irrigation of greenbelt areas, landscape, medians, parks, schools, and a golf course. Since 1995, the City has purchased an average of approximately 270 acre-feet per year of recycled water from WBMWD. The City's recycled water system is currently optimized and is unlikely to expand. However, the City will continue to coordinate with WBMWD and take advantage of opportunities to expand recycled water facilities throughout its borders to allow for optimization of recycled water use within the City.

According to WBMWD's 2010 Plan, recycled water target customers are expanding from traditional irrigation users such as golf courses and parks to unconventional commercial and industrial users. Recycled water is now being used by oil refineries and for cooling towers. In addition, WBMWD is investigating recycled water use in fabric dye houses, cogenerating plants, and commercial laundries. Recycled water demands for industrial and irrigation uses within WBMWD's service area are projected to increase from 14,182 acre-feet per year (current) to approximately 37,382 acre-feet per year (by 2035). In addition, recycled water demands for groundwater recharge (indirect potable reuse) within WBMWD's service area are projected to increase from 7,706 acre-feet per year (current) to approximately 20,480 acre-feet per year (by 2035). In 2009, WBMWD completed a Capital Implementation Master Program (CIMP) which includes all planned projects for recycled water through the year 2030. WBMWD's CIMP includes expansion of the ECLWRF and Hyperion Secondary Effluent Pump Station facilities.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

4.5.5 PROJECTED RECYCLED WATER USE

Section 10633

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

The City's potential recycled water usage is provided in Table 4-10. The City's recycled water system is currently optimized and is unlikely to expand. However, the City will continue to coordinate with WBMWD and take advantage of opportunities to expand recycled water facilities throughout its borders to allow for optimization of recycled water use within the City. The City's projected recycled water use from 2015 through 2030 is anticipated to remain relatively steady at approximately 280 acre-feet per year.

Table 4-10 Recycled Water – Potential Future Use
(DWR Guidebook Table 23)

Table 23 Recycled water — potential future use								
User type	Description	Feasibility ¹	2015	2020	2025	2030	2035 - opt	
Agricultural irrigation			0	0	0	0	--	
Landscape irrigation ²		Feasible	238	238	238	238	--	
Commercial irrigation ³			0	0	0	0	--	
Golf course irrigation		Feasible	42	42	42	42	--	
Wildlife habitat			0	0	0	0	--	
Wetlands			0	0	0	0	--	
Industrial reuse			0	0	0	0	--	
Groundwater recharge			0	0	0	0	--	
Seawater barrier			0	0	0	0	--	
Geothermal/Energy			0	0	0	0	--	
Indirect potable reuse			0	0	0	0	--	
Other (user type)			0	0	0	0	--	
Other (user type)			0	0	0	0	--	
Total			0	280	280	280	280	0

Units are in acre-feet per year.

¹ *Technical and economic feasibility.*

² *Includes parks, schools, cemeteries, churches, residential, or other public facilities)*

³ *Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)*

4.5.6 ENCOURAGING USE OF RECYCLED WATER

Section 10633

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

The City has recognized the use of recycled water as a means by which to reduce the City's reliability on imported water sources. To help promote the use of recycled water, the City buys recycled water from WBMWD and sells it to customers within the City at approximately 80 percent of the potable water rate.

According to WBMWD's 2010 Plan, WBMWD generates interest in recycled water by contacting potential customers and cities with sites that are located near an existing main pipeline, have a high water use potential in which a line can be constructed, are mandated to use recycled water, and/ or express interest. For commercial and industrial customers, WBMWD emphasizes the benefit of recycled water as a tool for profitability for businesses that goes beyond the benefits of water conservation. WBMWD markets recycled water as a resource that is: less expensive than potable water; more reliable than imported water in a drought; and consistent with statewide goals for water supply and ecosystem improvement on both the State Water Project and Colorado River systems.

In addition to WBMWD wholesaling recycled water at a rate lower than potable water, other financial incentives are used to encourage recycled water use. Some potential recycled water customers do not have the financial capability to pay for the onsite plumbing retrofits necessary to accept recycled water. Therefore, WBMWD advances funds for retrofit expenses, which can later be reimbursed through the water bills.

WBMWD and the City pursue different sources of funding to help subsidize new recycled water distribution facilities by submitting applications for grant funds when

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

available. Use of such funds, when approved, help increase the economic feasibility of constructing distribution system improvements necessary to reach new customers.

Methods to encourage recycled water use are summarized in Table 4-11.

Table 4-11 Methods to Encourage Recycled Water Use
(DWR Guidebook Table 25)

Table 25 Methods to encourage recycled water use						
Actions	Projected Results					
	2010	2015	2020	2025	2030	2035 - opt
Financial incentives						
WBMWD Financial Incentives	280	280	280	280	280	--
Total	280	280	280	280	280	--

Units are in acre-feet per year.

4.5.7 PLAN FOR OPTIMIZING USE OF RECYCLED WATER

Section 10633

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

As discussed in Section 4.5.4, WBMWD completed a CIMP in 2009 which includes all planned projects for recycled water through the year 2030. WBMWD's CIMP includes expansion of the ECLWRF and Hyperion Secondary Effluent Pump Station facilities and a Harbor-South Bay Recycled Water Expansion Project. These projects will increase recycled water supplies and improve system reliability within WBMWD's recycled water service area. WBMWD also plans multiple treatment and conveyance system facilities improvements. These improvements will enhance the safety, operability and efficiency of both the distribution system and treatment facilities. Some improvements will be made to comply with safety, water quality or other regulatory requirements or will be done to lower operating costs or improve equipment life. Capital costs for projects planned over the next five years have been budgeted to average

approximately \$30 million a year. These costs will be funded through MWD, United States Army Corps of Engineers, and other federal, state and local grant funds.

4.6 FUTURE WATER PROJECTS

Section 10631

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

The City's future water supply projects are summarized in Table 4-12 and include the following:

- New Groundwater Well – According to the City's 2009 Water Master Plan, the City plans to construct a new groundwater well and associated water main improvements over the next five years. The proposed well is anticipated to be constructed so that total well capacity (the existing Well 11A, the existing Well 15, and the proposed new well) can be increased to 4,000 gallons per minute.
- Groundwater Well Rehabilitation – The City plans to rehabilitate the existing Well 11A and associated infrastructure refurbishment (pump, motor, etc.) over the next five years to help restore well capacity and allow for greater redundancy in meeting water demands.
- Water Distribution Replacement Program – The City will continue to replace aging water meters, fire hydrants, water mains, and associated facilities to help minimize distribution system water losses.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

- Purchase of Water Rights – The City currently has an adjudicated right of 1,130.20 from the West Coast Basin. In the past, the City has supplemented these rights by leasing additional rights from other West Coast Basin agencies.

Table 4-12 Future Water Supply Projects
(DWR Guidebook Table 26)

Table 26 Future water supply projects								
Project name ¹	Projected start date	Projected completion date	Potential project constraints ²	Normal-year supply ³	Single-dry year supply ³	Multiple-dry year first year supply ³	Multiple-dry year second year supply ³	Multiple-dry year third year supply ³
Water Rights Leases	Current	On-going	Availability	--	--	--	--	--
Additional Groundwater Wells	2012	2013	--	--	--	--	--	--
Groundwater Well Refurbishment	Current	On-going	--	--	--	--	--	--
Total			-	-	-	-	-	-

Units are in acre-feet per year.

¹ Water volumes presented here should be accounted for in Table 16.

² Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.

³ Provide estimated supply benefits, if available.

**SECTION 5
WATER SUPPLY RELIABILITY AND WATER SHORTAGE
CONTINGENCY PLANNING**

5.1 WATER SUPPLY RELIABILITY

5.1.1 WATER MANAGEMENT TOOLS

Section 10620(f)

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

This Plan describes water management tools and options used by the City to maximize local resources and minimize the need to import water. These include Groundwater Basin Management Structure (Section 4.2), Future Water Projects (Section 4.6), and Demand Management Measures (DMMs) (Section 6).

5.1.2 SUPPLY INCONSISTENCY

Section 10631(c)(2)

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

The reliability of the groundwater supply for the City is primarily dependent upon the management of the West Coast Basin. If the City's demands for a given year exceed allowed extractions from the West Coast Basin, including water rights leases, the City can supplement its groundwater supply with imported water delivered through WBMWD. WBMWD is a member agency MWD which supplies WBMWD with its water. The management of the West Coast Basin is based on its adjudication, which is described in Section 4.2. The reliability of imported water supplies is included in

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

WBMWD’s Plan (See Appendix I, Section 5.2). As total recycled water and desalination water supplies are projected to increase within WBMWD’s service area, WBMWD anticipates gradually reducing its dependence on imported supplies and therefore should have imported water allocations available in future years. As a result of the West Coast Basin management, the City has not experienced water supply deficiencies. A summary of factors which may result in water supply inconsistency is provided in Table 5-1. A summary of water quality (See Section 5.3) impacts to water supply is provided in Table 5-2.

Table 5-1 Factors Resulting in Inconsistency of Supply
(DWR Guidebook Table 29)

Table 29 Factors resulting in inconsistency of supply							
Water supply sources ¹	Specific source name, if any	Limitation quantification	Legal	Environmental	Water quality	Climatic	Additional information
Groundwater	West Coast Basin	NA	NA	NA	NA	NA	
Purchased Water	WBMWD	NA	NA	NA	NA	NA	

Units are in acre-feet per year.
¹ From Table 16.

Table 5-2 Water Quality – Current and Projected Water Supply Impacts
(DWR Guidebook Table 30)

Water quality — current and projected water supply impacts							
Water source	Description of condition	2010	2015	2020	2025	2030	2035 - opt
Groundwater	See Section 5.3	No Impact	--				
Purchased Water	Treated	No Impact	--				

Units are in acre-feet per year.

5.2 WATER SHORTAGE CONTINGENCY PLANNING

5.2.1 CATASTROPIC INTERRUPTION OF WATER SUPPLIES

Section 10632

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

The City could experience a catastrophic interruption in the water supply as a result of a regional power outage, earthquake, terrorism, or other event. A successful recovery plan is dependent upon an in depth understanding of the vulnerability of each source of supply, delivery system, and distribution system to potential catastrophes. Possible catastrophes and preparation actions being taken to reduce the severity of each event are discussed below.

5.2.1.1 REGIONAL POWER OUTAGE

The City Public Works Department currently has five (5) fixed diesel backup generators designed to maintain uninterrupted potable water supply operations at 100 percent of its facilities. These generators are located at the following sites:

- Well 11A,
- Well 15,
- Larsson Booster Station,
- Peck Reservoir, and
- Block 35.

Additionally, in the event of a power outage, the City can supply power for all of the City Yard's needs with an Onan diesel generator located in the City Public Works Yard. If needed, battery power for the telemetry remote terminal units (RTUs) and an uninterruptible power supply (UPS) can provide backup power for the SCADA system. The City does not anticipate there will be problems with the distribution of water to the

City service area during a regional power outage. In the event that the City is unable to maintain the water supply, the City has procedures in-place to address this concern (i.e., contacting bottled water suppliers and access to tank trucks that can assist in providing water to affected areas).

5.2.1.2 EARTHQUAKE

The City has developed a comprehensive Emergency Response Plan to address specific responses to earthquakes, damage assessments, evacuations, and major line breaks. The Emergency Response Plan also identifies agency and mutual-aid contacts to help restore the City's critical water system infrastructure.

5.2.1.3 TERRORISM

Pursuant to the requirements of the Bioterrorism Act of 2002, the City completed a Security Vulnerability Assessment to identify and propose mitigation solutions to prevent deliberately-induced events. The planning scenarios included contamination, bomb threats, security breaches, and vandalism, all of which were analyzed in detail and documented in a confidential report.

The Security Vulnerability Assessment resulted in security enhancement recommendations the City has implemented such as motion detectors, control key locks, background checks, lighting and fencing improvements, and access hatch alarms. In addition to these improvements, City personnel conduct reservoir, well and equipment inspections daily and have increased security awareness as part of their daily operations.

5.2.2 MANDATORY PROHIBITIONS

Section 10632

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

The City's mandatory prohibitions against water use practices during water shortages include the following:

A. Landscape

1. **Watering Hours.** No lawn or landscape area shall be spray irrigated between the hours of 9:00 a.m. and 6:00 p.m. on any day. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.
2. **Irrigation Overspray and Runoff.** Water shall not spray or flow to any impermeable private or public surface, including but not limited to, walkways, driveways, sidewalks, alleys, streets, or storm drains.
3. **Water Drift.** No sprinklers, fountains or other water features shall be operated when winds are so high as to create water drifting causing runoff or flow to any impermeable public surface, including, but not limited to, walkways, driveways, sidewalks, alleys, streets, or storm drains as well as private driveways, sidewalks and patios.
4. **Over-Irrigation.** It is prohibited to water or irrigate lawns, turf or other landscape beyond saturation causing runoff or flow to any impermeable public surface, including, but not limited to, walkways, driveways, sidewalks, alleys, streets, or storm drains as well as private driveways, sidewalks and patios.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

5. **Irrigation During/After a Rain Event.** It is prohibited to water or irrigate any landscaping within twenty-four (24) hours of a one-tenth of an inch (0.10") or greater rainfall event.
- B. Cleaning.** No person shall:
1. Use water to wash, clean or clear any sidewalks, streets, walkways, patios, Driveways, alleys or parking areas, whether paved or unpaved, with a hose connected to a domestic water source unless through use of a water broom. Exception: Pressure washing may be permitted.
 2. Wash or clean with water any vehicle, including, but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or unmotorized, except by use of a hand-held bucket or similar container or a hose equipped with a positive action quick release shutoff valve or nozzle. This subsection shall not apply to any commercial car washing facility which utilizes a recycling system to capture or reuse water.
- C. Water Features and Water Recreation Facilities.** No person shall:
1. Fill any water feature such as a fountain, pond, lake or water display unless the water feature is constructed with a water recirculation system.
 2. Fill any water recreation facility such as a hot tub, spa, permanent swimming or wading pool unless the water recreation facility is constructed, installed or equipped with a cover to reduce water loss due to evaporation.
- D. Waste, Ponding and Leaks.** No person shall:
1. Cause, permit or allow water to leak from any exterior or interior pipe, hose or plumbing fixture of any kind whatsoever.
 2. Cause, permit or allow water to flow from any source on private or public property into gutters, streets, alleys or storm drains except as a result of

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

rainfall or excessive groundwater from a private sump pump or from a nonpotable source of water.

3. Cause, permit or allow water from any source to pond on private or public property except as a result of rainfall.
4. Cause, permit or allow water to flow from any source on private or public property without beneficial use.

E. Eating and Drinking Establishments.

1. All eating and drinking establishments of any kind whatsoever including, but not limited to, any restaurant, hotel, cafe, cafeteria, bar or club, whether public or private, shall only provide drinking water to any person upon receipt of an express request.
2. All food service businesses shall install water conserving pre-rinse nozzles.

F. Hotels, Motels, Bed and Breakfast.

1. All hotels, motels and bed and breakfast establishments shall provide customers the option of choosing not to have towels laundered daily. Each establishment shall prominently display notice of this option in each bathroom and sleeping room using clear easily understood language.
2. Within five (5) years from the effective date of this ordinance, July 2, 2009, all guest room toilets shall be replaced with the best available technology low flow toilets.

G. Carwashes.

1. Any new carwash system shall have a water recirculation system.
2. Within five (5) years from the effective date of this ordinance, July 2, 2009, all existing carwash systems shall have installed water recirculation systems.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

H. Commercial Establishments In General.

1. All nonresidential buildings in the City shall within five (5) years from the effective date of this ordinance, July 2, 2009, replace all:
 - a. Public toilets and urinals with best available technology low flow toilets and urinals.
 - b. Dishwashers with water efficient dishwashers.
2. Water efficient washing machines shall be installed upon replacement of existing or acquisition of new washing machines in nonresidential buildings.

I. Hoses. No person shall allow water to flow freely from a hose that is not equipped with a positive action quick release shutoff valve or nozzle.

J. Exceptions. The provisions of this section are not applicable to the uses of water which are necessary to protect public health and safety or for essential services, such as police, fire and other similar emergency services.

The City's mandatory prohibitions are provided in Section 7.44.030 of the City's Municipal Code (See Appendix K) and summarized in Table 5-3.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

Table 5-3 Water Shortage Contingency – Mandatory Prohibitions
(DWR Guidebook Table 36)

Table 36 Water shortage contingency — mandatory prohibitions	
Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
1. Water lawns and landscape between hours of 9am and 6 pm any day	Permanent
2. Watering to wash, clean or clear hard-surfaced areas	Permanent
3. Washing Vehicles without recirculation	Permanent
4. Water features and water recreation facilities filling any water feature without recirculation	Permanent
5. Leaks, breaks or malfunction	Permanent
6. Serving water at restaurants without receipt of an express request	Permanent
7. Hotels, motels, bed and breakfast provide customers option not to have towels laundered	Permanent
8. Free flowing water from hose without being equipped with release shutoff valve or nozzle	Permanent

5.2.3 CONSUMPTION REDUCTION METHODS

Section 10632

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

The City utilizes the following consumption reduction methods to overcome water shortages upon declaration by the Metropolitan Water District of a phased water shortage:

- A. **Stage 1 Water Shortage.** When the Metropolitan Water District implements its stage 1 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect:
1. Landscape irrigation using potable water shall be limited to no more than fifteen (15) minutes per watering zone per watering day.
 2. Landscape watering with potable water shall be limited to three (3) times per week between:
 - a. 6:00 p.m. on Monday and 9:00 a.m. the following Tuesday;

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

- b. 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday;
and
 - c. 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday.
 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

- B. **Stage 2 Water Shortage.** When the Metropolitan Water District implements its stage 2 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to all stage 1 water shortage restrictions:
 1. No landscape watering with potable water unless a timed sprinkler system is installed or watering is done with a handheld device.
 2. Landscape watering with potable water shall be limited to two (2) times per week for not more than fifteen (15) minutes per watering zone from:
 - a. 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday;
and
 - b. 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday.
 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

- C. **Stage 3 Water Shortage.** When the Metropolitan Water District implements its stage 3 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to the stage 1 and 2 water shortage restrictions:
 1. Washing of vehicles is prohibited except at commercial car washes or by mobile high pressure/low volume commercial services.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

2. Landscape watering with potable water shall be limited to one (1) time per week for not more than fifteen (15) minutes per watering zone from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday.
3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

D. **Stage 4 Water Shortage.** When the Metropolitan Water District implements its stage 4 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to all stage, 1, 2 and 3 water shortage restrictions:

1. Home reverse osmosis treatment units and water softeners shall be disconnected or turned off.
2. Watering of nonpublic playing fields with potable water is prohibited.
3. Landscape watering with potable water shall be limited to one (1) time per week from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday by only drip irrigation, hand held hoses, or if reclaimed water is utilized as permitted by law.
4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

E. **Stage 5 Water Shortage or Above.** When the Metropolitan Water District implements its stage 5 through 10 water shortage allocation reduction the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to all stage 1, 2, 3, and 4 water shortage restrictions:

1. Filling of residential swimming pools or spas with potable water is prohibited.

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

2. Landscape irrigation with potable water is prohibited except with a watering can using water captured from indoor use.
3. Any additional water conservation measures adopted by the Director of Public Works or his or her designee deemed necessary for the preservation of public health, safety and welfare.
4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

The City's consumption reduction methods are provided in Section 7.44.040 of the City's Municipal Code (See Appendix K) and summarized in Table 5-4.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

**Table 5-4 Water Shortage Contingency – Consumption Reduction Methods
(DWR Guidebook Table 37)**

Table 37 Water shortage contingency — consumption reduction methods		
Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
<p>1. Landscape irrigation using potable water shall be limited to no more than fifteen (15) minutes per watering zone per watering day.</p> <p>2. Landscape watering with potable water shall be limited to three (3) times per week between: 6:00 p.m. on Monday and 9:00 a.m. the following Tuesday; 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday; and 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday.</p> <p>3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.</p>	Stage 1	5%
<p>1. No landscape watering with potable water unless a timed sprinkler system is installed or watering is done with a handheld device.</p> <p>2. Landscape watering with potable water shall be limited to two (2) times per week for not more than fifteen (15) minutes per watering zone from:</p> <p style="margin-left: 20px;">a. 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday; and</p> <p style="margin-left: 20px;">b. 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday.</p> <p>3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.</p>	Stage 2	10%
<p>1. Washing of vehicles is prohibited except at commercial car washes or by mobile high pressure/low volume commercial services.</p> <p>2. Landscape watering with potable water shall be limited to one (1) time per week for not more than fifteen (15) minutes per watering zone from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday.</p> <p>3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.</p>	Stage 3	15%
<p>1. Home reverse osmosis treatment units and water softeners shall be disconnected or turned off.</p> <p>2. Watering of nonpublic playing fields with potable water is prohibited.</p> <p>3. Landscape watering with potable water shall be limited to one (1) time per week from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday by only drip irrigation, hand held hoses, or if reclaimed water is utilized as permitted by law.</p> <p>4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.</p>	Stage 4	20%
<p>1. Filling of residential swimming pools or spas with potable water is prohibited.</p> <p>2. Landscape irrigation with potable water is prohibited except with a watering can using water captured from indoor use.</p> <p>3. Any additional water conservation measures adopted by the Director of Public Works or his or her designee deemed necessary for the preservation of public health, safety and welfare.</p> <p>4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.</p>	Stage 5 or Above	25% through 50%

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

5.2.4 PENALTIES OR CHARGES FOR EXCESSIVE USE

Section 10632

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

For violations pertaining to the emergency water conservation allocation described in Section 5.2.3, a surcharge upon the customer’s regular water bill shall be imposed in an amount equivalent to the unit rate charged to the City by WBMWD for excess water purchased.

The penalties imposed by the City for violation of any of the provisions outlined in Section 5.2.2 are available in Section 7.44.070 of the City’s Municipal Code (See Appendix K) and are summarized in Table 5-5 and detailed below.

Table 5-5 Water Shortage Contingency – Penalties and Charges
(DWR Guidebook Table 38)

Table 38 Water shortage contingency — penalties and charges		
Penalties or Charges	Stage When Penalty Takes Effect	
Penalties		
Warning Notice		1st Violation
Flow Restricting Device Installed		3rd and Subsequent Violations
Charges		
\$25.00 surcharge upon the customer's regular water bill.		2nd Violation
\$50.00 surcharge upon the customer's regular water bill and the reasonable costs incurred from installing and removing flow-restriction devices and for restoration of normal service.		3rd Violation

1. First Prohibition Violation

The City shall issue a written notice to the customer of the fact that a first violation of any water shortage emergency whether it be Phase I, Phase II, Phase III, Phase IV, or Phase V has occurred.

2. Second Prohibition Violation

For a second violation during any water shortage phase, whether it be Phase I, Phase II, Phase III, Phase IV, or Phase V, Manhattan Beach shall impose a surcharge of \$25.00 upon the customer's regular water bill.

3. Third and Subsequent Prohibition Violations

For a third and each subsequent violation during any water shortage, whether it be Phase I, Phase II, Phase III, Phase IV, or Phase V, the City shall install a flow-restricting device of one gallon per minute capacity for services up to one inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight hours. The City shall charge the customer the reasonable costs incurred for installing and for removing the flow-restricting devices and for restoration of normal service. The charge shall be paid before normal service can be restored. In addition, a surcharge of \$50.00 shall be imposed upon the customer's regular water bill.

5.2.5 REVENUE AND EXPENDITURE IMPACTS

Section 10632

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

5.2.5.1 MEASURES TO OVERCOME REVENUE IMPACTS

In 2010, the City implemented a five year tiered water rate structure designed to encourage water conservations while preserving its ability to generate revenue. The rate structure will sustain a 20 percent in decreased water use before adverse impacts on revenue are realized.

Measures to overcome impacts of reduced water supply beyond 20 percent and consequential revenue shortfall will include the following:

1. Reduce the current fiscal year operation and maintenance expenses.
2. Defer Capital Improvement Projects
3. Reduce future projected operation and maintenance expenses.
4. Increase the fixed readiness-to-serve charge to establish a substantial firm revenue base.
5. Increase commodity charge and water adjustment rate to cover revenue requirements.

5.2.5.2 MEASURES TO OVERCOME EXPENDITURE IMPACTS

During periods of drought, the City may impose a surcharge for excess water use equivalent to the penalties imposed on the City by WBMWD. Such action will compensate for increased expenditures, which may arise in times of increased demand.

5.2.6 DRAFT WATER SHORTAGE CONTINGENCY RESOLUTION OR ORDINANCE

Section 10632

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

The City has adopted a water shortage contingency plan (See Appendix L).

5.2.6.1 WATER SHORTAGE PLANNING

During calendar year 2007, critically dry conditions impacted MWD's main water supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt (and subsequently other aquatic species) in the Sacramento-San Joaquin River Delta resulting in restrictions on the availability of State Water Project water. As a result, MWD adopted a Water Supply Allocation Plan

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

(WSAP), in February 2008 to allocate available water supplies to its member agencies. The WSAP establishes ten different shortage levels and a corresponding Allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced Allocation to a member agency for its Municipal and Industrial (M&I) retail demand and provides a reduced Allocation for the Interim Agricultural Water Program (IAWP). The WSAP considers historical local water production, full service treated water deliveries, agricultural deliveries and water conservation efforts when calculating each member agency's Allocation.

In general, the WSAP process calculates total historical member agency demand. That historical demand is then compared to member agency projected local supply for a specific Allocation year. The balance required from MWD, less an Allocation reduction factor, is the member agency's "Water Supply Allocation". When a Member Agency reduces its local demand through conservation or other means, the Allocation will increase. Because the demand has been eliminated, the Allocation can be used to purchase Full Service untreated water for replenishment deliveries.

The City has also prepared a list of water conservation measures that apply at each stage of local water shortage. These measures are contained in Chapter 7.44 of the City's Municipal Code (See Appendix K).

Customers may file an application for relief from any of the provisions in Chapter 7.44 through the City Manager's office as detailed in MBMC Section 7.44.060.

5.2.6.2 PRIORITY BY USE

Priorities for use of available potable water during shortages were based on input from the "City Emergency Response Team", citizen groups, and legal requirements set forth in the California Water Code, Sections 350-358. Water allocations are established for all customers according to the following ranking system:

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

- Minimum health and safety allocations for interior residential needs (includes single family, multi-family and convalescent facilities, retirement communities, fire fighting, and public safety),
- Commercial, industrial, institutional/governmental operations (where water is used for manufacturing and for minimum health and safety allocations for employees and visitors) to maintain jobs and economic base of the community (not for landscape uses),
- Existing landscaping, and
- New customers and proposed projects without permits when shortage declared.

5.3 WATER QUALITY

Section 10634

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

5.3.1 GROUNDWATER

The groundwater quality of the West Coast Basin is actively monitored by WRD. The WRD has created the Regional Groundwater Monitoring Program to track the water quality in the Central Basin and West Coast Basin. The Regional Groundwater Monitoring Program includes over 50 locations and nearly 250 monitoring wells. WRD takes approximately 500 groundwater samples annually. The samples are tested for over 100 water quality constituents to monitor the water quality in the Central Basin and West Coast Basin.

Groundwater produced by the City is currently blended with imported water from MWD. The City has experienced high manganese concentrations in its groundwater. To comply with the EPA and CDPH drinking water standards, the City must blend its groundwater with imported water to limit manganese concentrations to no more than 50 milligrams per liter (mg/L) (secondary standard). According to the City's 2010 Water

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

Master Plan, the City adjusts the amount of imported water such that the blended water has a final manganese concentration of no more than 45 mg/L. The blended groundwater and imported water are mixed directly at the point of entrance to a reservoir and discharged into the center of the reservoir to assure a thorough mix. The water is then pumped out of the reservoir where it is disinfected before entering the distribution system. The system is generally disinfected to bring the residuals up to 2.5 mg/L. Additional water quality information, indicating that the City is in compliance with all state and federal water quality standards, is available in the City's 2010 Annual Water Quality Report (Appendix M)

5.3.2 IMPORTED WATER

As indicated in Section 2.1.2.3, the City purchases imported water supplies from MWD through WBMWD. Imported water provided by MWD meets all state and federal water quality standards.

5.4 DROUGHT PLANNING

5.4.1 RELIABILITY OF SUPPLY AND VULNERABILITY TO SEASONAL OR CLIMATIC SHORTAGE

Section 10631(c)(1)

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

- (A) An average water year.*
- (B) A single dry water year.*
- (C) Multiple dry water years.*

Information regarding the reliability of the groundwater supply from the West Coast Basin is based on the availability of the City's total water supplies to meet demands during seasonal or climatic shortage. According to the rainfall data for the Los Angeles Airport Station (See Table 2-1), the historical annual average rainfall is approximately 12.2 inches. Based on WBMWD's 2010 Plan (See Appendix I, Section

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

5.2): calendar year 1999 represents an average water year for the City; calendar year 2001 represents a single dry water year for the City; and calendar years 2001 through 2003 represent a multiple dry year sequence for the City. Table 5-6 shows the basis of the water year data.

Table 5-6 Basis of Water Year Data
(DWR Guidebook Table 27)

Table 27 Basis of water year data	
Water Year Type	Base Year(s)
Average Water Year	1999
Single-Dry Water Year	2001
Multiple-Dry Water Years	2001 to 2003

Table 3-4 shows production during an average year (1999), single dry water year (2001) and multiple dry water years (2001 to 2003). A single dry water year or multiple dry water years did not compromise the City's ability to provide a reliable supply of water to its customers.

As indicated in Section 2.1.2.3, imported water can be purchased from WBMWD. The reliability of purchased water supplies is included in WBMWD's 2010 Plan (See Appendix I, Section 5.2).

The City's recycled water supply from WBMWD is limited only by system constraints and not by availability because recycled water is not subject to hydrologic variations. The reliability of WBMWD's recycled water supply is included in WBMWD's Plan (See Appendix I, Section 5.1.3).

Therefore, based on current management practices in the West Coast Basin and the reliability of imported water purchased from WBMWD, the minimum water supplies available on an average water year, a single dry water year, and multiple dry water years have historically been greater than the City's water demand.

5.4.2 STAGES OF ACTION IN RESPONSE TO WATER SUPPLY SHORTAGES

Section 10632

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

The City utilizes the following stages of action to overcome water shortages upon declaration by the Metropolitan Water District of a phased water shortage:

- A. **Stage 1 Water Shortage.** When the Metropolitan Water District implements its stage 1 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect:
1. Landscape irrigation using potable water shall be limited to no more than fifteen (15) minutes per watering zone per watering day.
 2. Landscape watering with potable water shall be limited to three (3) times per week between:
 - a. 6:00 p.m. on Monday and 9:00 a.m. the following Tuesday;
 - b. 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday;
and
 - c. 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday.
 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.
- B. **Stage 2 Water Shortage.** When the Metropolitan Water District implements its stage 2 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to all stage 1 water shortage restrictions:

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

1. No landscape watering with potable water unless a timed sprinkler system is installed or watering is done with a handheld device.
 2. Landscape watering with potable water shall be limited to two (2) times per week for not more than fifteen (15) minutes per watering zone from:
 - a. 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday;
and
 - b. 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday.
 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.
- C. **Stage 3 Water Shortage.** When the Metropolitan Water District implements its stage 3 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to the stage 1 and 2 water shortage restrictions:
1. Washing of vehicles is prohibited except at commercial car washes or by mobile high pressure/low volume commercial services.
 2. Landscape watering with potable water shall be limited to one (1) time per week for not more than fifteen (15) minutes per watering zone from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday.
 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.
- D. **Stage 4 Water Shortage.** When the Metropolitan Water District implements its stage 4 water shortage allocation reduction, the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to all stage, 1, 2 and 3 water shortage restrictions:

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

1. Home reverse osmosis treatment units and water softeners shall be disconnected or turned off.
2. Watering of nonpublic playing fields with potable water is prohibited.
3. Landscape watering with potable water shall be limited to one (1) time per week from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday by only drip irrigation, hand held hoses, or if reclaimed water is utilized as permitted by law.
4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

E. **Stage 5 Water Shortage or Above.** When the Metropolitan Water District implements its stage 5 through 10 water shortage allocation reduction the following restrictions on the use of water from the Manhattan Beach Water System shall be in effect in addition to all stage 1, 2, 3, and 4 water shortage restrictions:

1. Filling of residential swimming pools or spas with potable water is prohibited.
2. Landscape irrigation with potable water is prohibited except with a watering can using water captured from indoor use.
3. Any additional water conservation measures adopted by the Director of Public Works or his or her designee deemed necessary for the preservation of public health, safety and welfare.
4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law.

The City's stages of action are provided in Section 7.44.040 of the City's Municipal Code (See Appendix K) and summarized in Table 5-7.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

**Table 5-7 Water Shortage Contingency – Rationing Stages to Address Water Supply Shortages
(DWR Guidebook Table 35)**

Table 35 Water shortage contingency — rationing stages to address water supply shortages		
Stage No.	Water Supply Conditions	% Shortage
Stage 1	<ol style="list-style-type: none"> 1. Landscape irrigation using potable water shall be limited to no more than fifteen (15) minutes per watering zone per watering day. 2. Landscape watering with potable water shall be limited to three (3) times per week between: 6:00 p.m. on Monday and 9:00 a.m. the following Tuesday; 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday; and 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday. 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law. 	5%
Stage 2	<ol style="list-style-type: none"> 1. No landscape watering with potable water unless a timed sprinkler system is installed or watering is done with a handheld device. 2. Landscape watering with potable water shall be limited to two (2) times per week for not more than fifteen (15) minutes per watering zone from: <ol style="list-style-type: none"> a. 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday; and b. 6:00 p.m. on Saturday and 9:00 a.m. the following Sunday. 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law. 	10%
Stage 3	<ol style="list-style-type: none"> 1. Washing of vehicles is prohibited except at commercial car washes or by mobile high pressure/low volume commercial services. 2. Landscape watering with potable water shall be limited to one (1) time per week for not more than fifteen (15) minutes per watering zone from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday. 3. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law. 	15%
Stage 4	<ol style="list-style-type: none"> 1. Home reverse osmosis treatment units and water softeners shall be disconnected or turned off. 2. Watering of nonpublic playing fields with potable water is prohibited. 3. Landscape watering with potable water shall be limited to one (1) time per week from 6:00 p.m. on Wednesday and 9:00 a.m. the following Thursday by only drip irrigation, hand held hoses, or if reclaimed water is utilized as permitted by law. 4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law. 	20%
Stage 5 or Above	<ol style="list-style-type: none"> 1. Filling of residential swimming pools or spas with potable water is prohibited. 2. Landscape irrigation with potable water is prohibited except with a watering can using water captured from indoor use. 3. Any additional water conservation measures adopted by the Director of Public Works or his or her designee deemed necessary for the preservation of public health, safety and welfare. 4. This subsection shall not apply to any drip irrigation system, irrigation system maintenance, leak repair or new planting of low water usage plants or if reclaimed water is utilized as permitted by law. 	25% through 50%

¹ One of the stages of action must be designed to address a 50 percent reduction in water supply.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

5.4.3 THREE YEAR MINIMUM WATER SUPPLY

Section 10632

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

Based on WBMWD's 2010 Plan (See Appendix I, Section 5.2), the City's driest three-year historical sequence occurred during calendar years 2001, 2002, and 2003. The ratios between the normal water year in 1999 and single and multiple dry years were estimated for the City's supply, as shown on Table 5-8. These ratios were used to estimate the minimum water supply available during 2011, 2012, and 2013 (see Table 5-9).

Table 5-8 Supply Reliability — Historic Conditions
(DWR Guidebook Table 28)

Table 28 Supply reliability — historic conditions					
Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
		Year 1	Year 2	Year 3	Year 4
Percent of Average/Normal Year:	95.7%	95.7%	98.5%	96.9%	--

Table 5-9 Supply Reliability – Current Water Sources
(DWR Guidebook Table 31)

Table 31 Supply reliability — current water sources				
Water supply sources ¹	Average / Normal Water Year Supply ²	Multiple Dry Water Year Supply ²		
		Year 2011	Year 2012	Year 2013
Groundwater	1,186	1,146	1,143	1,201
Purchased Water	5,825	5,495	5,675	5,539
Recycled Water	217	276	302	264
Percent of normal year:	100.0%			

Units are in acre-feet per year.

¹ From Table 16.

² See Table 27 for basis of water type years.

5.4.4 WATER USE REDUCTION MEASURING MECHANISM

Section 10632

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

The City takes several steps to monitor water consumption during various stages of water supply shortage. The reduction monitoring procedure is described below.

1. Water Supply Report

Potable water production figures are recorded daily. Totals are reported monthly to the City's Water Distribution Supervisor are incorporated into a Water Supply Report. This report is then forwarded to the WBMWD and the WRD. With this data it is possible to develop trends for monthly water production and use.

2. Water Usage Records

The City maintains water use records on each individual customer account. Exceptionally high usage is identified at the time the meter is read. These accounts are investigated for potential water loss or abuse. Additionally, water use graphical trends are recorded on a customer's water bill, comparing water use for the current billing cycle to the same billing cycle of the previous year.

3. Monthly Water Production Report

During all stages of a water shortage, daily production figures are reported to and monitored by the City's Water Distribution Supervisor. The Water Distribution Supervisor compares the monthly production to the target monthly production to verify that the reduction goal is being met.

5.4.5 ASSESSMENT OF THE RELIABILITY OF WATER SERVICE

Section 10635

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

As previously discussed in Section 3.1, the City applied SBX7-7 to estimate the City's 2015 Interim Urban Water Use Target of 161.2 GPCD and the City's 2020 Urban Water Use Target of 143.3 GPCD. These Urban Water Use Targets were then applied to estimate the City's projected normal year demands in 2015, 2020, 2025 and 2030, as shown on Table 3-7. The City will continue to use groundwater, imported water, and recycled water as its future water supplies over the next 20 years. The following sections discuss the City's water service reliability assessment, which compares the City's supply and demand over the next 20 years during normal, dry and multiple dry water years.

5.4.5.1 NORMAL WATER YEAR

As previously discussed, the City's projected normal water year demand over the next 20 years in five-year increments was based on the City's 2015 and 2020 Urban Water Use Targets of 161.2 GPCD and 143.3 GPCD, respectively. The City's projected supply is shown on Table 4-1. The comparison of the City's projected supply and demand during a normal water year is shown on Table 5-10. As shown on Table 5-10, the City's supply can meet demands during a normal water year for the next 20 years.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

**Table 5-10 Supply and Demand Comparison – Normal Year
(DWR Guidebook Table 32)**

Table 32 Supply and demand comparison — normal year					
	2015	2020	2025	2030	2035 - opt
Supply totals (from Table 16)	6,510	5,928	5,956	5,984	--
Demand totals (From Table 11)	6,510	5,928	5,956	5,984	--
Difference	0	0	0	0	--
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	--
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	--

Units are in acre-feet per year.

5.4.5.2 SINGLE-DRY YEAR

As shown on Table 5-6, the City experienced a single-dry year during calendar year 2001 and a normal water year during calendar year 1999. The ratio between the normal water year and single-dry year was estimated for the City’s supply and demand, as shown on Table 5-8. This ratio and the projected supply and demand during a normal water year from Table 5-10 was used to estimate the City’s projected supply and demand during a single-dry year over the next 20 years in five-year increments. The comparison of the City’s projected supply and demand during a single-dry year is shown on Table 5-11. As shown on Table 5-11, the City’s supply can meet demands during a single-dry year for the next 20 years.

**Table 5-11 Supply and Demand Comparison – Single Dry Year
(DWR Guidebook Table 33)**

Table 33 Supply and demand comparison — single dry year					
	2015	2020	2025	2030	2035 - opt
Supply totals^{1,2}	6,230	5,673	5,699	5,726	--
Demand totals^{2,3,4}	6,230	5,673	5,699	5,726	--
Difference	0	0	0	0	--
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	--
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	--

Units are in acre-feet per year.

¹ Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of

² Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.

³ Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.

⁴ The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

5.4.5.3 MULTIPLE DRY YEARS

As shown on Table 5-6, the City experienced multiple dry years during calendar years 2001, 2002, and 2003. The ratio between the normal water year in calendar 1999 and multiple dry years were estimated for the City's supply and demand, as shown on Table 5-8. This ratio and the projected supply and demand during a normal water year from Table 5-10 was used to estimate the City's projected supply and demand during multiple dry years over the next 20 years in five-year increments. The comparison of the City's projected supply and demand during multiple dry years is shown on Table 5-12. As shown on Table 5-12, the City's supply can meet demands during multiple dry years for the next 20 years.

**Table 5-12 Supply and Demand Comparison – Multiple Dry Year Events
(DWR Guidebook Table 34)**

Table 34 Supply and demand comparison — multiple dry-year events						
		2015	2020	2025	2030	2035 - opt
Multiple-dry year first year supply	Supply totals^{1,2}	6,230	5,673	5,699	5,726	--
	Demand totals^{2,3,4}	6,230	5,673	5,699	5,726	--
	Difference	0	0	0	0	--
	Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	--
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	--
Multiple-dry year second year supply	Supply totals^{1,2}	6,412	5,839	5,866	5,894	--
	Demand totals^{2,3,4}	6,412	5,839	5,866	5,894	--
	Difference	0	0	0	0	--
	Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	--
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	--
Multiple-dry year third year supply	Supply totals^{1,2}	6,308	5,744	5,771	5,798	--
	Demand totals^{2,3,4}	6,308	5,744	5,771	5,798	--
	Difference	0	0	0	0	--
	Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	--
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	--

Units are in acre-feet per year.

¹ Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.

² Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.

³ Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.

⁴ The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

<This Page Intentionally Left Blank>

SECTION 6 DEMAND MANAGEMENT MEASURES

The City is committed to implementing water conservation programs and works collaboratively with WBMWD to provide water conservation programs for its residents. As a member of WBMWD, the City's residents have the benefit of participating in WBMWD's conservation efforts. WBMWD offers an extensive program throughout the West Coast Basin and is a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California (MOU) and is therefore a member of the California Urban Water Conservation Council (CUWCC). A copy of the WBMWD's "Best Management Practices" reports provided to CUWCC are included in WBMWD's 2010 Plan (See Appendix G of Appendix I). Although the City did not sign the MOU regarding Urban Water Conservation in California and is not a member of the CUWCC, the City takes advantage of its relationship with WBMWD as a member agency. The following sections describe the City's implementation of the Demand Management Measures (DMMs) required in the UWMP Act.

**CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN**

6.1 DEMAND MANAGEMENT MEASURES BEING IMPLEMENTED

Section 10631

- (f) *Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
- (1) *A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:*
 - (A) *Water survey programs for single-family residential and multifamily residential customers.*
 - (B) *Residential plumbing retrofit.*
 - (C) *System water audits, leak detection, and repair.*
 - (D) *Metering with commodity rates for all new connections and retrofit of existing connections.*
 - (E) *Large landscape conservation programs and incentives.*
 - (F) *High-efficiency washing machine rebate programs.*
 - (G) *Public information programs.*
 - (H) *School education programs.*
 - (I) *Conservation programs for commercial, industrial, and institutional accounts.*
 - (J) *Wholesale agency programs.*
 - (K) *Conservation pricing.*
 - (L) *Water conservation coordinator.*
 - (M) *Water waste prohibition.*
 - (N) *Residential ultra-low-flush toilet replacement programs.*
 - (2) *A schedule of implementation for all water demand management measures proposed or described in the plan.*
 - (3) *A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.*
 - (4) *An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.*

**6.1.1 WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL
AND MULTIFAMILY RESIDENTIAL CUSTOMERS [10631(F)(1)(A)]**

WBMWD, in conjunction with the City, encourages its member agencies, including the City, to implement water survey programs. In 2007, WBMWD designed a residential landscape program called the Green Garden Program and received a grant for \$231,000 from the United States Bureau of Reclamation. WBMWD also received local funding through a partnership with MWD and several of its local retail water agencies. The Green Garden Program focused on providing qualified residents with free

CITY OF MANHATTAN BEACH
2010 URBAN WATER MANAGEMENT PLAN

landscape surveys, “smart” irrigation controllers and rotating sprinkler nozzles. The program contained the following three steps:

- **Step 1:** Residents first contacted WBMWD’s Program vendor to pre-qualify.
- **Step 2:** WBMWD’s vendor provided a free landscape survey and if the resident had an older, inefficient irrigation controller, they were invited to a free sprinkler controller exchange event.
- **Step 3:** Residents brought their old irrigation controllers to the exchange event, and at the event the resident would be provided with a “smart” irrigation controller and rotating sprinkler nozzles. They would also receive one hour of training on how to install and program the controller.

Upon completion of the program in September 2010, WBMWD conducted a water use study to compare the pre-controller installation water use with the post-installation water use and found an overall water savings of 14 percent. This percentage translates to about 47 gallons saved per day. Additional water savings information is provided in WBMWD’s 2010 Plan (See Appendix I, Section 7.5.1).

6.1.2 RESIDENTIAL PLUMBING RETROFIT [10631(F)(1)(B)]

In conjunction with WBMWD, the City participates in the distribution of showerheads, aerators, and toilet tank leak detection tablets. These conservation kits are distributed at the Hometown Fair, Earth Day events, and Water Awareness Month, as well as at City Hall upon request or establishment of new account. At these events, the City also emphasizes water use surveys and ULFT replacement programs. The kits are also available to City customers at WBMWD sponsored festivals and events. These distributions are not recorded, and therefore, not quantifiable. However, these events continue to provide the consumer with access to information regarding available residential plumbing retrofits, as well as a variety of other water conservation materials.

In addition, on December 21, 2010, the Manhattan Beach City Council approved the Toilet Retrofit Ordinance No. 2138, requiring dwellings meet specific water conserving standards for toilets prior to transfer of ownership. A copy of Ordinance No. 2138 is provided in Appendix N.

6.1.3 SYSTEM WATER AUDITS, LEAK DETECTION, AND REPAIR
[10631(F)(1)(C)]

Water line replacements are made based on a number of factors: a history of leaks in a particular line over a number of years; flow, or lack thereof, as calculated by flow testing the line; and sizing, undersized lines such as the few remaining 2-inch lines as well as 4-inch lines. The City also has an ongoing valve exercise program to ensure interconnections with adjacent utilities work properly.

In coordination with the Fire Department, the Water Department standardized fire hydrants and associated fire protection equipment. The City is continually upgrading its distribution system and hydrant placements to meet or exceed minimum fire flow requirements in accordance with California Water Works standards. The accounting staff annually reviews data records to confirm that the unaccounted-for-water losses remain under six percent.

6.1.4 METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS
[10631(F)(1)(D)]

The City has meters in place for all of its customers, including separate meters for single-family residential, commercial, large landscape, and institutional/governmental customer sectors. For water customers with 5/8", 3/4" and 1" meters, water is billed on a three tiered system; water customers with 1/2" through 10" meters are billed on a fixed rate based on volume of water consumed; in addition, a fixed bi-monthly service fee based on meter size is billed separately. The City's water bill provides each customer with summaries of their water use, comparing current water use with water use of the

same period of the previous year. The City requires irrigation meters for all large landscape customers. During water shortages, this will help develop rationing allocations for non-residential customers with both interior and landscape demands. The City has also installed separate meters on all recycled water services. The City will continue to install and read meters on all new services, along with continuing to conduct its meter calibration and replacement program.

6.1.5 LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES [10631(F)(1)(E)]

The City, in conjunction with WBMWD, offers programs to assist retail agencies and their large landscape customers to use water efficiently. The programs offered include:

- ***Irrigation Survey and Water Budget***

The City and WBMWD staff conducted irrigation surveys for 100 percent of Manhattan Beach's large landscape customers. Over 90 percent of all large landscape regions within the City are city property or the Manhattan Beach School District. Most large landscape areas are already irrigated with recycled water.

- ***Irrigation Controller Program***

The City installed a Maxicom weather station at Veterans Parkway, Marine Avenue Park, Marine Sports Park, Polliwog Park and the Civic Center.. Daily climatological data (temperatures, relative humidity, wind velocity, evapotranspiration, and precipitation) are relayed by modem to a central computer that uses this data to automatically adjust watering time along the parkway. All other City facilities are set to automatic timers, which are adjusted periodically to meet climatic conditions.

• ***Ocean Friendly Gardens***

In 2005, the City in conjunction with WBMWD formed a partnership with the Surfrider Foundation to develop “Ocean Friendly Garden” workshops and demonstration gardens. WBMWD obtained state grant funding to finance courses focusing on planting ocean friendly plants and installing weather-based irrigation controllers as a way to reduce urban runoff. The use of water efficient plants and installation of efficient sprinkler controllers can conserve between 20 percent and 50 percent of current water use and reduce water runoff by up to 70 percent.

• ***Comprehensive Landscape Survey Program***

In 2006, WBMWD developed a Large Landscape Survey Program and was awarded funding through MWD’s Enhanced Conservation Program. This program provided the services of a qualified landscape surveyor to conduct comprehensive surveys on large landscapes and provide a detailed audit report along with recommendations. Fifteen sites were audited with a resulting 55.6 percent of average irrigation efficiency due to broken and mismatched sprinkler heads, over-watering, no hydro-zoning, puddling of water, dry spots, incorrect water scheduling and various other problems. Within the audit report, the water usage was analyzed and compared to the recommended water usage using the local weather or evapotranspiration potential. Key recommendations were also provided to the customers. Additional water savings information is provided in WBMWD’s 2010 Plan (See Appendix I, Section 7.5.5).

6.1.6 HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS
[10631(F)(1)(F)]

Since 2005, MWD has provided rebates for high-efficiency clothes washers to its member agencies. MWD has branded the term BeWaterWise to develop market recognition. During the 2006 to 2010 period, MWD conducted many radio and television commercials to promote the rebates as well as promoted the program on its website. MWD testing found that many of the high-efficiency machines had a Water Factor of 6.0 or less. In order to motivate the public to purchase the most efficient washers possible,

MWD developed a rebate that allowed only washers with a Water Factor of 4.0 or less to qualify for a \$100 washer rebate. The washer rebate incentive continues to be an effective tool to achieve water conservation. Additional water savings information is provided in WBMWD's 2010 Plan (See Appendix I, Section 7.5.5).

6.1.7 PUBLIC INFORMATION PROGRAMS [10631(F)(1)(G)]

The City promotes water conservation and resource efficiency in conjunction with WBMWD. The City distributes public information through bill inserts, brochures, and many special events every year. Water bills show usage for the last billing period compared to the same period the previous year. The City established a website which includes information on water conservation, recycling, and other resource issues.

In addition, as a member of WBMWD, the customers of the City can also receive public information about water conservation through WBMWD's various public information programs. WBMWD uses many strategies to help promote its programs to the public. It coordinates with local and regional agencies to promote water conservation messaging as well as developing its own public information programs.

6.1.8 SCHOOL EDUCATION PROGRAMS [10631(F)(1)(H)]

The City, in conjunction with WBMWD and the School District, work to promote water conservation and resource efficiency at school facilities and to educate students about these issues. WBMWD provides educational materials for several grade levels; including State and County water system maps, posters, workbooks, interactive computer software, and videos. WBMWD also sponsors project Water Education for Teachers (WET) training, science fairs, and water conservation contests. These programs are available to the community at any time upon request from the City or WBMWD.

6.1.9 CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL ACCOUNTS [10631(F)(1)(I)]

In association with WBMWD, the City has identified all large commercial customers within its service area and is encouraging them to take advantage of recycled water where the opportunity is available. All new commercial constructions must comply with water saving measures such as the installation of low flow toilets, showerheads, and HECWs used for commercial purposes. Most commercial sites within the City are small retail outlets with a single restroom. As with all customers within the City, commercial users are encouraged to repair any fixtures that may be wasting water (e.g., running toilets or sinks).

The City's planning department reviews the building plans to determine the proper meter size based upon Uniform Plumbing Code (UPC) fixture units and line size for any new residential or commercial construction. The City also requires the use of water efficient fixtures before a permit is issued to a new customer.

6.1.10 CONSERVATION PRICING [10631(F)(1)(K)]

The City has a fixed bimonthly service charge that is calculated by meter size, with usage being billed separately for all customer sectors. Beginning January 1, 2010, the City incorporated a tiered rate structure for water usage to encourage water conservation. Based on the rate structure, the cost for Tier 3 purchases will be more than double the cost for Tier 1 purchases for meters sizes less than or equal to 1-inch.

6.1.11 WATER CONSERVATION COORDINATOR [10631(F)(1)(L)]

The City's water conservation coordinator is a function performed primarily by the Water Distribution Supervisor working in conjunction with WBMWD and the School District. The City stresses water conservation via distribution of conservation handouts at City Hall and information booths at various community fairs. The Water Distribution Supervisor job description includes the performance of the duties associated with the Water Conservation Coordinator position; therefore, the expenditures for this program are included in the position salary.

In addition as a member of WBMWD, the City can utilize WBMWD's water conservation coordinator, who is employed by WBMWD to promote water conservation issues and programs within WBMWD's service area including the City.

6.1.12 WATER WASTE PROHIBITION [10631(F)(1)(M)]

The City adopted a revised "Water Shortage Contingency Plan" resolution No. 4965 in 1992 (See Appendix L) which is actively enforced during drought situations. It is also enforced in drought situations. The City's Municipal Code (See Appendix K) also specifies water conservation requirements. Enforcement includes patrolling to educate customers and if necessary, issuing warnings and citations for violations. All citations and violations are reported annually. However, records from the previous drought situation are not currently available. It has been observed that during the implementation of this program, the City has seen a reduction in the number of violations.

In addition, WBMWD helped to promote MWD's *Its Time to Get Serious* media campaign by developing a campaign to increase awareness of member agencies of the current water situation by requesting that they adopt a resolution. The resolution stated that the member agency would be willing to review their current ordinances and policies

as they related to water conservation. With WBMWD's effort, many cities adopted the resolution and seven cities actually passed stricter water efficiency ordinances.

In 2008 and 2009, MWD launched the Public Sector Program. This program provided upfront incentives to motivate the public including cities, counties, agencies, schools, and others, to purchase and install water-use efficiency devices. In order to participate in this program, MWD required each city to pass a Water Waste Prohibition Ordinance.

These ordinances feature provisions regarding water waste ranging from outdoor watering restrictions and requirements for water features and pools to requiring eating establishments to provide drinking water upon request only and requiring new car washes be equipped with recirculation systems.

6.1.13 RESIDENTIAL ULTRA-LOW FLUSH TOILET REPLACEMENT PROGRAMS [10631(F)(1)(N)]

In association with WBMWD, the City participates in an ULFT replacement program. All public facilities in the City now have Ultra-Low Flush Toilets and showerheads. The City is committed to continually working with WBMWD in this conservation effort. As advances in technology create new conservation devices that are more efficient than today's products, the City and WBMWD plan on incorporating them into this program.

In addition, on December 21, 2010, the Manhattan Beach City Council approved the Toilet Retrofit Ordinance No. 2138, requiring that prior to transfer of ownership, dwellings meet specific water conserving standards for toilets. A copy of Ordinance No. 2138 is provided in Appendix N.

6.2 DEMAND MANAGEMENT MEASURES NOT IMPLEMENTED

Section 10631

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

- (1) Take into account economic and non-economic factors, including environmental, social, health, customer impact, and technological factors.*
- (2) Include a cost-benefit analysis, identifying total benefits and total costs.*
- (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.*
- (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.*

6.2.1 WHOLESALE AGENCY PROGRAMS [10631(F)(1)(J)]

The City is a retail water supplier therefore cannot implement wholesale agency programs. However, as a member of WBMWD, the City participates in WBMWD's wholesale agency programs.

<This Page Intentionally Left Blank>

**SECTION 7
COMPLETED URBAN WATER MANAGEMENT CHECKLIST**

A completed Plan checklist, with page information indicating where the required element can be found within the Plan, is provided in Appendix O.

Z:\Jobs\2391\Text\2010 UWMP_Draft (120511).doc

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1.2.1
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1.2.2
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Section 1.3.1
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 1.2.3
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1.2.4
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Section 1.2.4
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Section 1.3.2
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 1.3.3

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 1.3.4
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 1.3.5
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 2.2.1
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 2.2.2
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2.3
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.3.1
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 2.3.2
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 3.2
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Section 3.4

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Section 3.2.5
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 3.1.1
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 3.3
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 3.3.1
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 4.1
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 4.1
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 4.2.1
16	Describe the groundwater basin.	10631(b)(2)		Section 4.2.2
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Section 4.2.1

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		Section 4.2.1 Section 4.2.3
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		Not Applicable
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 4.2.3
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 4.2.4
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4.3
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4.6
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 4.4
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 4.5.1
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 4.5.2

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 4.5.2
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 4.5.3
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 4.5.4
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 4.5.5
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4.5.6
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 4.5.7
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING ^b				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 5.1.1
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 5.4.1
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 5.1.2
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5.4.2

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5.4.3
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5.2.1
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5.2.2
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5.2.3
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5.2.4
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5.2.5
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Section 5.2.6
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 5.4.4
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 5.3

No.	UWMP requirement ^a	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5.4.5
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measure is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6.1
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 6.1
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 6.1
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Section 6.2
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not Applicable

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.