AGENDA

PUBLIC WORKS COMMISSION
CITY OF HUNTINGTON BEACH

Wednesday, January 16, 2013 – 5:00 PM
Utilities Yard
19021 Huntington Street
Huntington Beach, CA 92648

A. PLEDGE OF ALLEGIANCE

ROLL CALL Cook, Herbel, McGovern, O'Connell, Siersema, Spencer, Thomas

B. PRESENTATIONS-COMMENDATIONS

C. MINUTES

C-1. Minutes of August 15, 2012 and September 19, 2012

D. ORAL COMMUNICATIONS

Public Comments – the Public Works Commission welcomes public comments on all items on this agenda or of community interest. **Three minutes per person**, time may not be donated to others. Commission on this date can take no action on any item not on the agenda. This is the time to address Commission regarding items of interest or agenda items other than public hearings. Communications on agenda items will be scheduled such that public comments may be received as close to 5:00 p.m. as possible.

E. DIRECTOR'S ITEMS

E-1. February is the annual reorganization of the Public Works Commission with the election of the new Chair and Vice Chair. The election will be held at the next meeting.

F. INFORMATION ITEMS

F-1. Upcoming City Council Study Sessions - The City Council conducts public Study Sessions on the evenings of City Council meetings, normally beginning at 4:00 p.m., in Room B-8. A tentative listing of upcoming sessions is submitted for the Commission's information.

F-2. Active Capital Project Report – An update on active capital projects is presented for the Commission's information. Project information, including description, location maps and funding sources can be found in the FY 2012/13 Capital Improvement Program notebook, or on the city's website under Government, Current Budget information.

G. ADMINISTRATIVE ITEMS

G-1. Garfield Avenue Arterial Street Rehabilitation Project from Magnolia Street to Bushard Street, and Goldenwest Street from PCH to Yorktown Avenue, CC-1433 - Plans and Specifications for Street Rehabilitation Project CC No. 1433 for Garfield Avenue, from Magnolia Street to Bushard Street, and Goldenwest Street, from Pacific Coast Highway to Yorktown Avenue, are in final preparation with Notice inviting Sealed Bids anticipated advertising in January 2013.

Funding Source: Funds include the amounts of $1,133,000, budgeted in Prop 1B Grant Account No. 21890010.82300, $1,167,000, budgeted in Measure M Account No. 21390020.82300, and $405,000, budgeted in the Capital Improvement Reserve Account No. 10040314.82800. Reimbursements include approximately $145,000 from CalRecycle and $72,000 from a Cooperative agreement with Fountain Valley for their pavement portion on Garfield Avenue. The engineers cost estimate for the project is $2,500,000.

Recommended Action: Motion to recommend to the City Council, approval of Garfield Avenue Street Rehabilitation, from Magnolia Street to Bushard Street, and Goldenwest Street Rehabilitation, from Pacific Coast Highway to Yorktown Avenue, CC 1433.

G-2. Lambert Park Slope Repair, CC-1337- Plans and specifications for the Lambert Park Slope Repair, CC-1337 are in final preparation. Staff is seeking support for the project and the initiation of the competitive bid process.

Funding Source: Funds in the amount of $350,000 are budgeted in Capital Projects Account No. 10040314.

Recommended Action: Motion to recommend to the City Council approval of the Lambert Park Slope, CC-1337.

G-3. Water Master Plan/Financial Plan Presentation- Beginning in 2011, staff and consultant began work on an update of the Water Master Plan and Financial Plan. The final plan is presented for the Commission's recommendation to the City Council.

Funding Source: Funding for the update and for the projects recommended

therein is provided in the Water Fund (506).

Recommended Action: Motion to recommend to the City Council the adoption of the 2012 Water Master Plan and Financial Plan.

G-4. 25 mph Speed Limit on Delaware Street near Manning Park- Staff is recommending that a 25 mile per hour speed zone be established during daytime hours on Delaware Street adjacent to Manning Park to improve traffic safety conditions at that location.

Funding Source: Funds to implement the recommended speed zone are Included in the Public Works Department operating budget.

Recommended Action: Motion to recommend to the City Council staff's recommendation to establish a 25 mile per hour daytime speed zone on Delaware Street adjacent to Manning Park.

G-5. Amendments to HBMC Chapter 10.44 Parking Time Limits- Staff has identified several areas within the Chapter 10.44 of the Municipal Code where terminology and limitations appear to be in conflict or contradictory. Additionally, existing sections contain very restrictive statements that limit the ability of staff to use parking time limit restrictions to address a variety of circumstances and needs throughout the City. In some cases, parking restrictions have been implemented over the years that do not entirely conform to the limitations as stated in the code. As a result, staff has completed a comprehensive review of this chapter and is recommending the following modifications to better suit the practical application of these sections to meet a wide range of needs throughout the community.

Funding Source: Amendments to Chapter 10.44 of the Municipal Code does not require any separate funding.

Recommended Action: Motion to recommend to the City Council staff's recommendation to amend sections 10.44.010, 10.44.020, 10.44.030, and 10.44.040 of Chapter 10.44 of the Huntington Beach Municipal code relating to parking time limits.

H. WRITTEN COMMUNICATIONS

I. COMMISSION AND STAFF COMMENTS

J. ADJOURNMENT

NEXT PUBLIC WORKS COMMISSION MEETING
February 20, 2013, 5:00 PM, City Council Chambers

MINUTES

CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
AUGUST 15, 2012

Call to Order/ Pledge of Allegiance: The meeting was called to order at 5:00 p.m. by Vice-Chair O'Connell, who led Commissioners and the audience in the Pledge of Allegiance to the Flag.

Commissioners Absent: Cook, Herbel, Thomas

Commissioners Present: Commissioners McGovern, O'Connell, Siersema, and Spencer were in attendance.

Others Present: Travis Hopkins, Director of Public Works
Bob Milani, Senior Civil Engineer
Joyce Greene, Administrative Assistant

B. PRESENTATIONS-COMMENDATIONS

None

C. MINUTES

Of the four in attendance, only two attended the July meeting. Therefore, a quorum was not present to vote. The minutes were carried over to the September meeting for approval.

D. ORAL COMMUNICATIONS

None

E. DIRECTOR'S ITEMS

Travis Hopkins directed the Commissioners to a letter, copy provided to each Commissioner, sent to them by a citizen in opposition to a City Council action to save a large eucalyptus tree on Main Street that was to be removed during street rehabilitation. The citizen has been contacted by staff, and staff continues to be in communication with the resident regarding their concerns.

Commissioner McGovern expressed his concern of being put in an awkward position as the Public Works Commission recommending removal of the tree for multiple reasons. He feels a role of the Public Works Commission is to be

responsible to address safety concerns that affect all citizens. Travis Hopkins responded the City Council directed the department to make every effort to save the tree so staff is looking at alternatives. The tree will be evaluated annually for its condition, and the surrounding sidewalk will be evaluated to minimize any future risk to the city. Vice Chair O'Connell stated he agrees with Commissioner McGovern and voices the same concerns.

F. INFORMATION ITEMS

F-1. Active Capital Project Report – Travis Hopkins provided updates and then asked for any questions on the Capital Project Report.

Commissioner Siersema inquired about the rough slurry finish to the arterial rehabilitation on Magnolia from Adams to Indianapolis and the results with the contractor. Travis Hopkins responded the city took a credit against the cost of the project. His opinion is the surface will smooth out over time and with the next slurry seal in a few years.

G. ADMINISTRATIVE ITEMS

G-1. Water Main Extension Project, CC-1436 – Travis Hopkins introduced Bob Milani who presented the staff report.

Vice Chair O'Connell recused himself and left the room.

The water main extension on Springdale Street will add additional points of connection to separate water systems in order to build redundancy in water service. The extension of the water main will enhance reliability for water service and for greater fire protection.

Commissioner Siersema inquired about the railroad tracks and how staff will address that area. Bob Milani responded the railroad track is a military track that has not been used in years and is scheduled for removal. If the tracks have not been removed at the time of construction, the water line will be placed underground of the tracks with approval of the military.

Motion by Commissioner Siersema, seconded by Commissioner Spencer to recommend to the City Council approval of Water Main Extension Project, CC-1436.

VOTE:	The motion carried.
AYES:	3
NOES:	0
ABSENT:	3 (Cook, Herbel, Thomas)
ABSTENTIONS:	1 (O'Connell)

H. WRITTEN COMMUNICATIONS

Presented earlier in the meeting by Public Works Director Travis Hopkins.

I. COMMISSION AND STAFF COMMENTS

Travis Hopkins announced that Joyce Greene is retiring and this will be her last Public Works Commission meeting.

Motion by Commissioner McGovern, Seconded by Vice Chair O'Connell to acknowledge Joyce Greene for her service to the Public Works Commission.

The motion carried 4-0-3 (Cook, Herbel Thomas absent)

J. ADJOURNMENT

The meeting adjourned at 5:25 PM to September 19, 2012, in City Council Chambers.

Billy O'Connell	Joyce Greene
Vice-Chair	Administrative Assistant

MINUTES

CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
SEPTEMBER 19, 2012

Call to Order/ Pledge of Allegiance: The meeting was called to order at 5:05 p.m. by Vice-Chair O'Connell, who led Commissioners and the audience in the Pledge of Allegiance to the Flag.

Commissioners Absent: Cook, O'Connell and Siersema

Commissioners Present: Commissioners Herbel, McGovern, Spencer and Thomas were in attendance.

Others Present: Travis Hopkins, Director of Public Works
Bob Stachelski, Transportation Manager
Ken Dills, Project Manager

B. PRESENTATIONS-COMMENDATIONS

None

C. MINUTES

Motion by Commissioner McGovern, seconded by Commissioner Thomas to approve the minutes of July 18, 2012 as presented.

VOTE:	The motion carried.
AYES:	4
NOES:	0
ABSENT:	3 (Cook, O'Connell, Siersema)
ABSTENTIONS:	0

Of the four Commissioners in attendance, only two (McGovern and Spencer) attended the August meeting. Therefore, a quorum was not present to vote. The minutes were carried over to the October meeting for approval.

D. ORAL COMMUNICATIONS

None

E. DIRECTOR'S ITEMS

Travis Hopkins noted that the City Council was holding a special meeting on Monday, September 24, 2012 to consider adoption of the Fiscal Year 2012-2013 Budget.

F. INFORMATION ITEMS

F-1. Upcoming City Council Study Sessions – Travis Hopkins stated the Storm Drain Master Plan was tentatively scheduled for presentation at a November 2012 Study Session.

F-2 Active Capital Project Report – Travis Hopkins provided updates, noting the new format of the report, and then asked for any questions on the Capital Project Report.

Commissioner Herbel, referring to CC-1402 Golden View Safe Routes to Schools, which includes materials (light poles) to be provided by the City, asked Transportation Manager Bob Stachelski if there was still a long lead time on receiving these materials once ordered and whether any inventory of spare light poles was maintained by the City. Bob stated that delivery is normally 8-10 weeks and that only a few surplus poles are kept in stock.

Commissioner Spencer questioned the schedule of CC-1377 Brookhurst/Adams Improvements noting the overlap of the EIR and the design. Bob Stachelski stated that the EIR would be completed long before the design.

Commissioner McGovern noted the poor quality of the recent slurry seal performed on Magnolia (CC-1413). Travis Hopkins reported that the contractor experienced trouble with the slurry seal, but that the street was still protected. He added that the contractor was very cooperative, agreeing to a reduced price. Commissioner Herbel asked if there was any kind of warranty on the work. Travis stated that there is a one-year warranty and that the contractor was very reliable, having performed numerous jobs for the City in the past.

Commissioner Herbel noted that SC Edison work being done in the same area was causing a traffic issue and that work appears to have stalled. Travis said he would contact Edison and request a status.

Commissioner McGovern requested that completed projects and project costs be included on the new format monthly CIP report. Staff concurred and will include completed projects and project costs in the next monthly report.

F-3 Circulation Element Update Briefing – Transportation Manager Bob Stachelski presented an overview of the recommended update of the Circulation Element of the General Plan summarizing policy changes from the previous Circulation Element. He noted that the process had taken a long time, beginning in 2005, but that a number of factors had contributed to the delay,

including the update of the General Plan and the annexation of Sunset Beach. He noted that a Committee had been formed with members of the Public Works Commission, Planning Commission, City Council and staff to meet with the City consultants to discuss background information and components of the plan. He added that Commissioner McGovern had served on the Committee.

Bob noted that the comment period for the EIR on the Circulation Element had closed on Monday and that only 8 comment letters had been received, mostly from other agencies.

Bob noted that one of the major changes to the update was the designation of intersections. In order to more effectively manage the City's intersections, the new Circulation Element used a tiered designation approach, with the majority designated at level C or better. Bob noted that only a select number of intersections that would have service level E. This would include intersections such as Warner and PCH, where major issues and cost would arise if the intersection were to be brought to a higher service level.

Bob stated that other changes to the Circulation Element included the elimination of street segments from the standards and the acquisition of Beach Boulevard from the State. He added that the Beach Boulevard acquisition isn't being recommended, but has been included in order to address it as a possibility.

Bob noted the update also put in place a number of technical reports that would allow the Circulation Element to be updated more readily. He stated that an issue with a number of planning documents, the General Plan for instance, is that they become dated. The reports would allow staff to keep the Circulation Element current.

Commissioner Spencer questioned whether Garfield Avenue west of Edwards Street had been reviewed, noting the heavy traffic in this area. Bob Stachelski stated that all streets were reviewed as part of the update. Commissioner McGovern stated that from his experience serving on the Committee he could confirm that staff and the consultant had done a lot of work and were very thorough.

Chairman Herbel expressed concern for instances where streets are removed from the County's Master Plan of Highways.

G. ADMINISTRATIVE ITEMS

G-1. Crosswalk Removal Recommendation on Edinger Avenue at the West Bella Terra Driveway – Bob Stachelski presented an aerial photo of the crosswalk in question and noted that the planned removal was posted and only one

contact from the public had been received. Bob stated that once certain aspects of the removal were clarified, this person withdrew their concerns.

Motion by Chairman Herbel, seconded by Commissioner Spencer to support the staff recommendation to remove the crosswalk.

VOTE: The motion carried.
AYES: 4
NOES: 0
ABSENT: 3 (Cook, O'Connell, Siersema)
ABSTENTIONS: 0

H. WRITTEN COMMUNICATIONS

None.

I. COMMISSION AND STAFF COMMENTS

None.

J. ADJOURNMENT

The meeting adjourned at 6:02 PM to October 17, 2012, in City Council Chambers.

Tom Herbel
Chairman

Ken Dills
Project Manager

~2013~ CITY COUNCIL
STUDY SESSIONS
&
SPECIAL SESSIONS

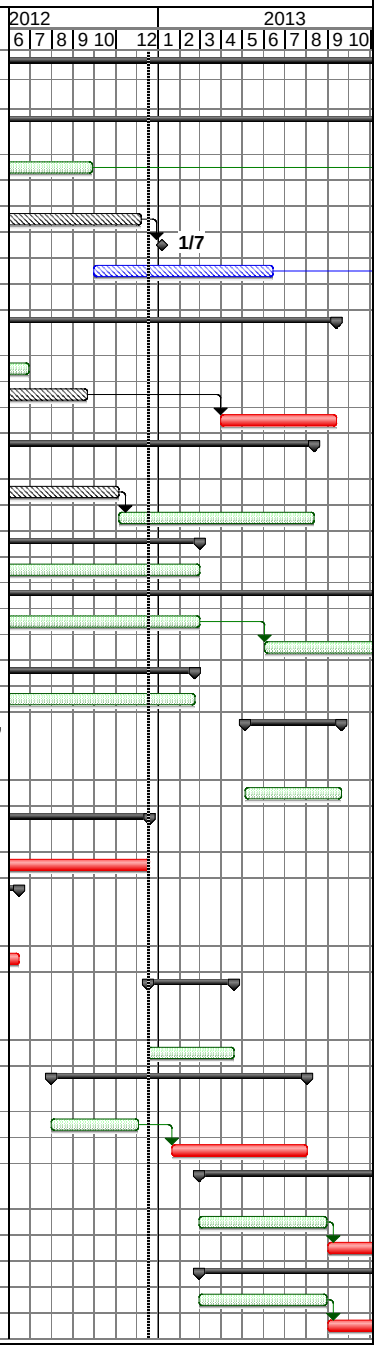
This information is for agenda scheduling purposes only and is subject to change on a daily basis. Subjects listed below are not guaranteed to appear on a City Council agenda.

COUNCIL MEETING	TIME	SUBJECT	DEPT HEAD
2013			
Jan. 7, 2013		***No Meeting***	
Jan. 22, 2013		Circulation Element Update Water Master Plan	Hess Hopkins
Feb. 4, 2013		Street Light RFQ	Hall
Feb. 19, 2013		DTSC Ascon Update	Hall
Mar. 4, 2013		*Storm Drain MP (date to be determined)*	Hopkins
Mar. 18, 2013			
April 1, 2013			
April 15, 2013			
May 6, 2013			
May 20, 2013			
June 3, 2013		CDBG – Allocations	Hall
June 17, 2013			
July 1, 2013			
July 15, 2013			
Aug. 5, 2013			
Aug. 19, 2013			
Sept. 3, 2013			
Sept. 16, 2013			
Oct. 7, 2013			
Oct. 21, 2013			
Nov. 4, 2013			
Nov. 18, 2013			
Dec. 2, 2013		**Mayor Transition**	
Dec. 16, 2013			

City of Huntington Beach
Capital Improvement Program Master Schedule

Mon 12/17/12

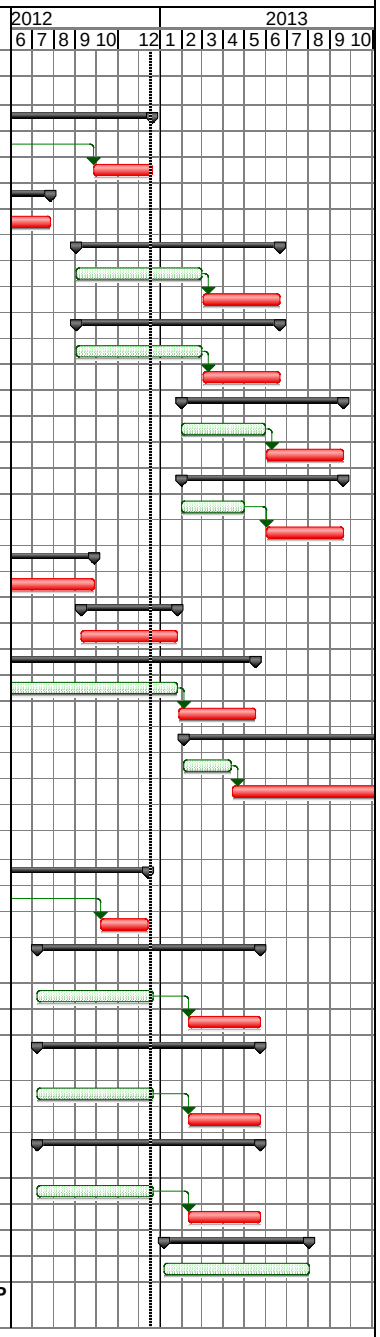
ID	Task Name	Duration	Start	Finish	Budget	Comments
1	**STREETS AND TRANSPORTATION**	**1561 days**	**Tue 9/16/08**	**Tue 9/9/14**		
2	**ARTERIAL**	**1430 days**	**Mon 1/5/09**	**Fri 6/27/14**		
3	**CC-1319 Atlanta Avenue Widening (Huntington to Delaware)**	**1430 days**	**Mon 1/5/09**	**Fri 6/27/14**	**$3,300,000**	**Preparation of Recirculated MND underway.**
4	Council approval of Relocation Plan	975 days	Mon 1/5/09	Fri 9/28/12		
5		0 days	Mon 12/19/11	Mon 12/19/11		
6	Revise MND	150 days	Mon 5/14/12	Fri 12/7/12		
7	Council approval of Revised MND	0 days	Mon 1/7/13	Mon 1/7/13		
8	Right-of-Way Acquisition Process	185 days	Mon 10/1/12	Fri 6/14/13		
9	Bidding&Construction	100 days	Mon 2/10/14	Fri 6/27/14		
10	**CC-1356 Bridge Rehabilitation BPMP Program (Warner, Magnolia, & Brookhurst)**	**600 days**	**Mon 5/30/11**	**Fri 9/13/13**	**$1,500,000**	**Design On-Going**
11	Design	285 days	Mon 5/30/11	Fri 6/29/12		
12	Caltrans Authorization to Construct (Warner)	120 days	Mon 4/9/12	Fri 9/21/12		
13	Construction (Warner)	120 days	Mon 4/1/13	Fri 9/13/13		
14	**CC-1450-53 Bridge Rehabilitation HBRR Program (Admiralty, Humbolt, Davenport, Gilbert)**	**441 days**	**Mon 12/5/11**	**Mon 8/12/13**	**$600,000**	**Design On-Going**
15	Caltrans Authorization to Design	241 days	Mon 12/5/11	Mon 11/5/12		
16	Design (Admiralty, Humbolt)	200 days	Tue 11/6/12	Mon 8/12/13		
17	**CC-1376 Beach / Warner Improvements**	**705 days**	**Mon 6/21/10**	**Fri 3/1/13**	**$440,000**	**Study On-Going**
18	Preliminary Design & MND	705 days	Mon 6/21/10	Fri 3/1/13		
19	**CC-1377 Brookhurst / Adams Improvements**	**915 days**	**Mon 6/21/10**	**Fri 12/20/13**	**$885,000**	**Study On-Going**
20	Preliminary Design & EIR	705 days	Mon 6/21/10	Fri 3/1/13		
21	Final Design	145 days	Mon 6/3/13	Fri 12/20/13		
22	**CC-1403 Bushard / Adams Improvements**	**510 days**	**Mon 3/14/11**	**Fri 2/22/13**	**$100,000**	**Study On-Going**
23	Traffic Analysis Report	510 days	Mon 3/14/11	Fri 2/22/13		
24	**CC-1397 Arterial Rehabilitation: Argosy (Bolsa Chica to Graham), Yorktown (Main to Goldenwest), 6th (Walnut to Orange)**	**100 days**	**Mon 5/6/13**	**Fri 9/20/13**	**$200,000**	**Springdale and Garfield advanced, others pushed back**
25	Design (Argosy, Yorktown, 6th)	100 days	Mon 5/6/13	Fri 9/20/13		**Not Started**
26	**CC-1397 Arterial Rehabilitation: Garfield (Beach to Delaware), Main (Utica to Adams)**	**331 days**	**Wed 9/14/11**	**Wed 12/19/12**	**$1,550,000**	**Under Construction**
27	Construction	331 days	Wed 9/14/11	Wed 12/19/12		
28	**CC-1413 Arterial Rehabilitation: Magnolia (Adams to Indianapolis), Center (I405 to Railroad Tracks), Heil (Silver to Gothard), Main (Yorktown to Utica)**	**95 days**	**Mon 2/6/12**	**Fri 6/15/12**	**$2,000,000**	**Project Completed**
29	Construction	95 days	Mon 2/6/12	Fri 6/15/12		
30	**CC-1424 Arterial Rehabilitation Design: Main (Yorktown to Garfield), Lake (Indianapolis to Adams), Indianapolis (Beach to Brookhurst), Brookhurst (Bushard to PCH)**	**89 days**	**Tue 12/18/12**	**Fri 4/19/13**	**$200,000**	**Not Started**
31	Design	89 days	Tue 12/18/12	Fri 4/19/13		
32	**CC-1433 Goldenwest (Yorktown to PCH), Garfield (Magnolia to Bushard)**	**263 days**	**Wed 8/1/12**	**Fri 8/2/13**	**$2,705,000**	**Design On-Going**
33	Design	89 days	Wed 8/1/12	Mon 12/3/12		
34	Bidding (2 Months) & Construction	140 days	Mon 1/21/13	Fri 8/2/13		
35	**CC-1454 Beach / Edinger Improvements**	**231 days**	**Fri 3/1/13**	**Fri 1/17/14**	**$350,000**	**Not Started**
36	Design	131 days	Fri 3/1/13	Fri 8/30/13		
37	Bidding (2 Months) & Construction	100 days	Mon 9/2/13	Fri 1/17/14		
38	**CC-1447 Edinger Parkway Path**	**231 days**	**Fri 3/1/13**	**Fri 1/17/14**	**$250,000**	**Not Started**
39	Design	131 days	Fri 3/1/13	Fri 8/30/13		
40	Bidding (2 Months) & Construction	100 days	Mon 9/2/13	Fri 1/17/14		



City of Huntington Beach
Capital Improvement Program Master Schedule

Mon 12/17/12

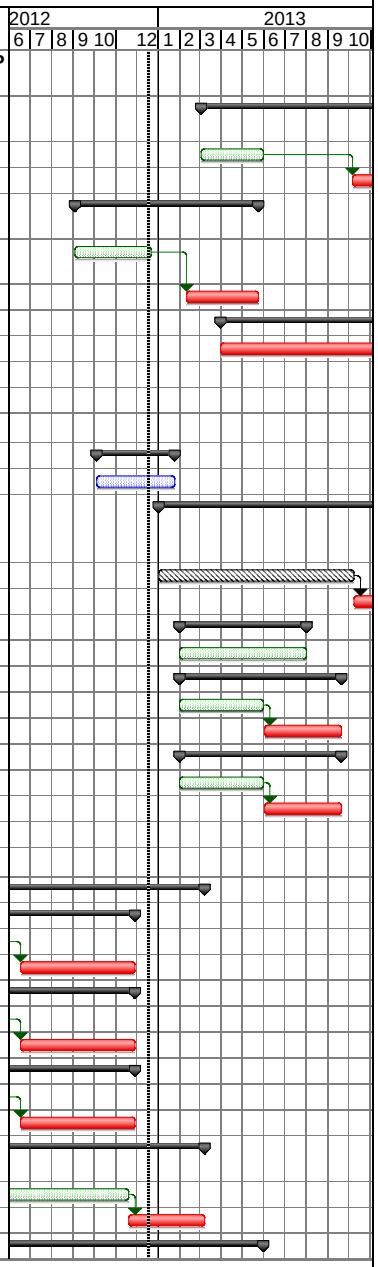
ID	Task Name	Duration	Start	Finish	Budget	Comments
41						
42	**NEIGHBORHOOD/LOCAL STREET**	**550 days**	**Mon 10/31/11**	**Fri 12/6/13**		
43	**CC-1418 Tree Petition Street (11/12) - Aulnay Lane**	**299 days**	**Mon 10/31/11**	**Thu 12/20/12**	**$500,000**	**Under Construction**
44	Design	130 days	Mon 10/31/11	Fri 4/27/12		
45	Construction	60 days	Fri 9/28/12	Thu 12/20/12		
46	**CC-1417 Residential Pavement (11/12)**	**55 days**	**Mon 5/14/12**	**Fri 7/27/12**	**$2,020,000**	**Completed**
47	Construction	55 days	Mon 5/14/12	Fri 7/27/12		
48	**CC-1438 Hanover Lane Rehab (Tree Petition)**	**210 days**	**Mon 9/3/12**	**Fri 6/21/13**	**$600,000**	**Not Started**
49	Design	130 days	Mon 9/3/12	Fri 3/1/13		
50	Bidding (2 Months) & Construction	80 days	Mon 3/4/13	Fri 6/21/13		
51	**CC-1439 Keelson Lane Rehab**	**210 days**	**Mon 9/3/12**	**Fri 6/21/13**	**$400,000**	**Not Started**
52	Design	130 days	Mon 9/3/12	Fri 3/1/13		
53	Bidding (2 Months) & Construction	80 days	Mon 3/4/13	Fri 6/21/13		
54	**CC-1441 Lakeview Drive Sidewalk and Retaining Wall**	**166 days**	**Fri 2/1/13**	**Fri 9/20/13**	**$250,000**	**Not Started**
55	Design	86 days	Fri 2/1/13	Fri 5/31/13		
56	Bidding (2 Months) & Construction	80 days	Mon 6/3/13	Fri 9/20/13		
57	**CC-1442 Residential Pavement Rehab - Zone 7**	**166 days**	**Fri 2/1/13**	**Fri 9/20/13**	**$2,100,000**	**Not Started**
58	Design	64 days	Fri 2/1/13	Wed 5/1/13		
59	Bidding (2 Months) & Construction	80 days	Mon 6/3/13	Fri 9/20/13		
60	**Concrete Replacement (11/12)**	**170 days**	**Mon 2/6/12**	**Fri 9/28/12**	**$500,000**	**Under Construction**
61	Construction	170 days	Mon 2/6/12	Fri 9/28/12		
62	**CC-1434 ADA Ramps (11/12)**	**100 days**	**Mon 9/10/12**	**Fri 1/25/13**	**$75,000**	**Completed**
63	Construction	100 days	Mon 9/10/12	Fri 1/25/13		
64	**CC-1425 Street Light Replacement - 7th St. (PCH to Palm)**	**400 days**	**Mon 11/7/11**	**Fri 5/17/13**	**$378,000**	**Design On-Going**
65	Design	320 days	Mon 11/7/11	Fri 1/25/13		
66	Bidding (2 Months) & Construction	80 days	Mon 1/28/13	Fri 5/17/13		
67	**CC-1460 10th St. Street Lighting Replacement**	**220 days**	**Mon 2/4/13**	**Fri 12/6/13**	**$475,000**	**Not Started**
68	Design	50 days	Mon 2/4/13	Fri 4/12/13		
69	Construction	170 days	Mon 4/15/13	Fri 12/6/13		
70						
71	**TRANSPORTATION**	**1561 days**	**Tue 9/16/08**	**Tue 9/9/14**		
72	**CC-1402 Golden View School (SR2S)**	**205 days**	**Mon 3/5/12**	**Fri 12/14/12**	**$249,000**	**Under Construction**
73	Design	60 days	Mon 3/5/12	Fri 5/25/12		
74	Construction	50 days	Mon 10/8/12	Fri 12/14/12		
75	**CC-1421 Signal Synchronization - Goldenwest (SR22 to PCH)**	**230 days**	**Mon 7/9/12**	**Fri 5/24/13**	**$317,000**	**Awaiting OCTA approval to complete design.**
76	Design	120 days	Mon 7/9/12	Fri 12/21/12		
77	Construction	75 days	Mon 2/11/13	Fri 5/24/13		
78	**CC-1422 Signal Synchronization - Talbert/Macarthur (Beach to SR55)**	**230 days**	**Mon 7/9/12**	**Fri 5/24/13**	**$29,000**	**Awaiting OCTA approval to complete design.**
79	Design	120 days	Mon 7/9/12	Fri 12/21/12		
80	Construction	75 days	Mon 2/11/13	Fri 5/24/13		
81	**CC-1423 Signal Synchronization - Warner (PCH to Red Hill)**	**230 days**	**Mon 7/9/12**	**Fri 5/24/13**	**$343,000**	**Awaiting OCTA approval to complete design.**
82	Design	120 days	Mon 7/9/12	Fri 12/21/12		
83	Construction	75 days	Mon 2/11/13	Fri 5/24/13		
84	**CC-1455 Ellis & Main Channelization**	**150 days**	**Mon 1/7/13**	**Fri 8/2/13**	**$60,000**	**Not Started**
85	Design	150 days	Mon 1/7/13	Fri 8/2/13		
86	**CC-1457 Gothard & Heil Signal Modification**	**230 days**	**Tue 9/16/08**	**Mon 8/3/09**		**On hold pending allocation of HSIP funds**



City of Huntington Beach
Capital Improvement Program Master Schedule

Mon 12/17/12

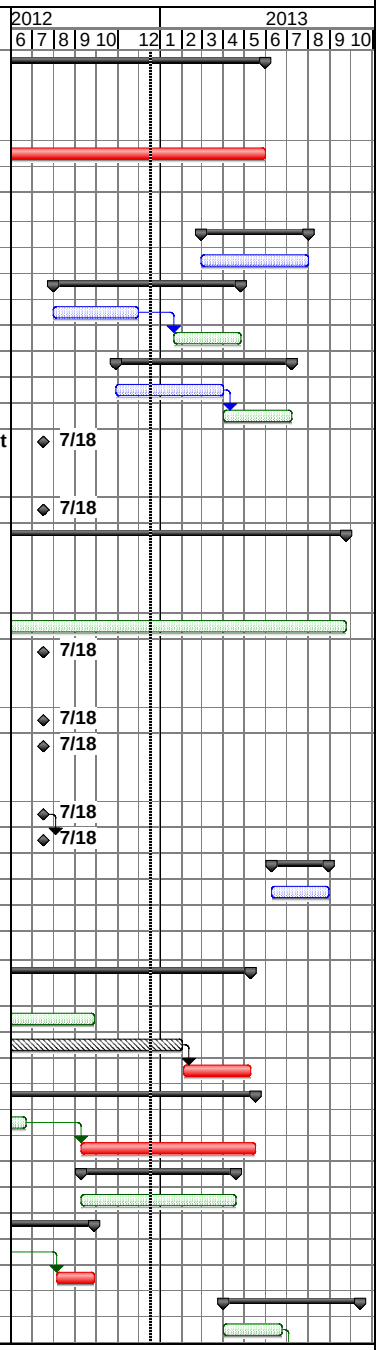
ID	Task Name	Duration	Start	Finish	Budget	Comments
87	**CC-1458 Gothard & Talbert Signal Modification**	**230 days**	**Tue 9/16/08**	**Mon 8/3/09**		**On hold pending allocation of HSIP funds**
88	**CC-1459 Yorktown & Huntington Access Modification**	**205 days**	**Mon 3/4/13**	**Fri 12/13/13**	**$65,000**	**Not Started**
89	Design	65 days	Mon 3/4/13	Fri 5/31/13		
90	Construction	50 days	Mon 10/7/13	Fri 12/13/13		
91	**CC-1426 Stacey Middle School and Clegg Elementary School Safe Route to School (Federal Funds)**	**189 days**	**Tue 9/4/12**	**Fri 5/24/13**	**$478,000**	**Design On-Going, contruction required Caltrans approval**
92	Design	79 days	Tue 9/4/12	Fri 12/21/12		
93	Construction	75 days	Mon 2/11/13	Fri 5/24/13		
94	**CC-1456 Edinger Ave. Traffic Signal Sychronization**	**377 days**	**Mon 4/1/13**	**Tue 9/9/14**	**$220,000**	**Not Started**
95	Design	262 days	Mon 4/1/13	Tue 4/1/14		
96	Bidding (2 Months) & Construction	115 days	Wed 4/2/14	Tue 9/9/14		
97						
98	**DRAINAGE & WATER QUALITY**	**503 days**	**Fri 10/5/12**	**Tue 9/9/14**		
99	**CC-1255A Talbert Lake Urban Runoff Diversion - Phase I**	**80 days**	**Fri 10/5/12**	**Thu 1/24/13**	**$1,000,000**	**Under Analysis**
100	Talbert Lake Water Study	80 days	Fri 10/5/12	Thu 1/24/13		
101	**CC-1293 Heil Pump Station Rebuild**	**440 days**	**Wed 1/2/13**	**Tue 9/9/14**	**$1,950,000**	**Design completed. Federal grant likely. Property acquisition to resume.**
102	Right-of-Way Acquisition	200 days	Wed 1/2/13	Tue 10/8/13		
103	Bidding (2 Months) & Construction	240 days	Wed 10/9/13	Tue 9/9/14		
104	**CC-1463 Meredith Pump Station Expansion**	**130 days**	**Fri 2/1/13**	**Thu 8/1/13**		**Not Started**
105	Design	130 days	Fri 2/1/13	Thu 8/1/13		
106	**CC-1445 Slater Channel Improvements**	**166 days**	**Fri 2/1/13**	**Fri 9/20/13**		**Not Started**
107	Design	86 days	Fri 2/1/13	Fri 5/31/13		
108	Bidding (2 Months) & Construction	80 days	Mon 6/3/13	Fri 9/20/13		
109	**CC-1461 First Street Diversion SCADA Project**	**166 days**	**Fri 2/1/13**	**Fri 9/20/13**		**Not Started**
110	Design	86 days	Fri 2/1/13	Fri 5/31/13		
111	Bidding (2 Months) & Construction	80 days	Mon 6/3/13	Fri 9/20/13		
112						
113	**FACILITY**	**510 days**	**Mon 6/20/11**	**Fri 5/31/13**		
114	**ADA IMPROVEMENTS**	**450 days**	**Mon 6/20/11**	**Fri 3/8/13**		
115	**Oakview Community Center ADA**	**378 days**	**Mon 6/20/11**	**Wed 11/28/12**	**$66,000**	**Under Construction**
116	Design	250 days	Mon 6/20/11	Fri 6/1/12		
117	Bidding (2 Months) & Construction	118 days	Mon 6/18/12	Wed 11/28/12		
118	**Central Park Restrooms ADA**	**378 days**	**Mon 6/20/11**	**Wed 11/28/12**	**$170,000**	**Under Construction**
119	Design	250 days	Mon 6/20/11	Fri 6/1/12		
120	Bidding (2 Months) & Construction	118 days	Mon 6/18/12	Wed 11/28/12		
121	**Banning Library ADA**	**378 days**	**Mon 6/20/11**	**Wed 11/28/12**	**$26,000**	**Under Construction**
122	Design	250 days	Mon 6/20/11	Fri 6/1/12		
123	Bidding (2 Months) & Construction	118 days	Mon 6/18/12	Wed 11/28/12		
124	**City Hall ADA - Phase I & Phase II**	**440 days**	**Mon 7/4/11**	**Fri 3/8/13**	**$339,000**	**Contract Awarded**
125	Design	361 days	Mon 7/4/11	Mon 11/19/12		
126	Bidding (2 Months) & Construction	79 days	Tue 11/20/12	Fri 3/8/13		
127	**ENERGY EFFICIENCY IMPROVEMENTS**	**470 days**	**Mon 8/15/11**	**Fri 5/31/13**		



City of Huntington Beach
Capital Improvement Program Master Schedule

Mon 12/17/12

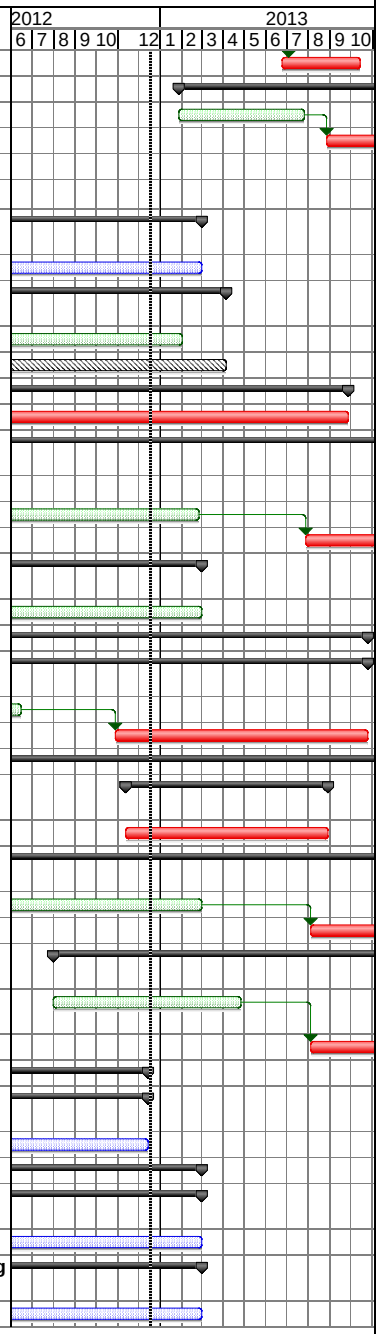
ID	Task Name	Duration	Start	Finish	Budget	Comments
128	**HVAC Measures, Interior Lighting Re-design & Retrofit, Additional Building Controls, Energy Information Management System, Server Virtualization & HVAC, Downtown Lighting Master Plan**	**470 days**	**Mon 8/15/11**	**Fri 5/31/13**	**$3,069,000**	**Construction complete, retrofit commissioning pending**
129	Bidding & Construction	470 days	Mon 8/15/11	Fri 5/31/13		
130						
131	**PARKS & BEACHES**	**1207 days**	**Mon 2/9/09**	**Tue 9/24/13**		
132	**CC-1462 South Beach Parking Lot**	**110 days**	**Fri 3/1/13**	**Thu 8/1/13**		**Not Started**
133	Design	110 days	Fri 3/1/13	Thu 8/1/13		
134	**CC-1437 Central Park Parking Lot**	**193 days**	**Wed 8/1/12**	**Fri 4/26/13**		**Not Started**
135	Design	88 days	Wed 8/1/12	Fri 11/30/12		
136	Bidding (2 Months) & Construction	70 days	Mon 1/21/13	Fri 4/26/13		
137	**CC-1337 Lambert Park Slope Repair**	**180 days**	**Tue 10/30/12**	**Mon 7/8/13**		**Not Started**
138	Design	110 days	Tue 10/30/12	Mon 4/1/13		**Design Completed**
139	Bidding (2 Months) & Construction	70 days	Tue 4/2/13	Mon 7/8/13		**After rainy season**
140	**Barlett Park (08/09)**	**0 days**	**Wed 7/18/12**	**Wed 7/18/12**	**$300,000**	**Need to amend consultant contract for MND. Working on a revised schedule.**
141	Environmental Clearance	0 days	Wed 7/18/12	Wed 7/18/12		
142	**Gun Range Site (08/09)**	**1207 days**	**Mon 2/9/09**	**Tue 9/24/13**	**$336,000**	**Evaluating possible scope changes. May need to revise EIR and Remedial Action Plan schedules.**
143	EIR and Remedial Action Plan	1207 days	Mon 2/9/09	Tue 9/24/13		
144	**CC-1345 LeBard Park (07/08 & 08/09)**	**0 days**	**Wed 7/18/12**	**Wed 7/18/12**	**$205,000**	**Council approved contract amendment. Work underway.**
145	Environmental	0 days	Wed 7/18/12	Wed 7/18/12		
146	**Sports Complex - Team Room**	**0 days**	**Wed 7/18/12**	**Wed 7/18/12**	**$162,700**	**On hold pending agreement with concessionaire to complete improvements**
147	Design & Procurement	0 days	Wed 7/18/12	Wed 7/18/12		
148	Construction	0 days	Wed 7/18/12	Wed 7/18/12		
149	**Shipley Nature Center Permanent Parking Lot**	**60 days**	**Mon 6/10/13**	**Fri 8/30/13**	**$86,250**	**Design underway**
150	Design	60 days	Mon 6/10/13	Fri 8/30/13		
151						
152	**SEWER**	**972 days**	**Mon 9/13/10**	**Tue 6/3/14**		
153	**CC-1370 Warner Ave Gravity Sewer Main & Lift Station "C" Reconstruction**	**695 days**	**Mon 9/13/10**	**Fri 5/10/13**	**$6,600,000**	**Design of ultimate solution underway.**
154	Final Design of Ultimate Solution	535 days	Mon 9/13/10	Fri 9/28/12		
155	Revised MND, Coastal Permit, and Regulatory Permits	260 days	Mon 2/6/12	Fri 2/1/13		
156	Construction	70 days	Mon 2/4/13	Fri 5/10/13		
157	**CC-1415 Algonquin/Boardwalk Lift Station**	**535 days**	**Mon 5/2/11**	**Fri 5/17/13**	**$2,100,000**	**Under Construction**
158	Design	300 days	Mon 5/2/11	Fri 6/22/12		
159	Construction	180 days	Mon 9/10/12	Fri 5/17/13		
160	**CC-1401 Trinidad Lift Station**	**160 days**	**Mon 9/10/12**	**Fri 4/19/13**	**$400,000**	**Design On-Going**
161	Design	160 days	Mon 9/10/12	Fri 4/19/13		
162	**CC-1419 Sewer Lining (11/12)**	**130 days**	**Mon 4/2/12**	**Fri 9/28/12**	**$100,000**	**Project Completed**
163	Design	40 days	Mon 4/2/12	Fri 5/25/12		
164	Construction	40 days	Mon 8/6/12	Fri 9/28/12		
165	**CC-1444 Sewer Lining (12/13)**	**140 days**	**Tue 4/2/13**	**Mon 10/14/13**	**$250,000**	**Not Started**
166	Design	60 days	Tue 4/2/13	Mon 6/24/13		



City of Huntington Beach
Capital Improvement Program Master Schedule

Mon 12/17/12

ID	Task Name	Duration	Start	Finish	Budget	Comments
167	Bidding (2 Months) & Construction	80 days	Tue 6/25/13	Mon 10/14/13		
168	**CC-1443 Beach Blvd. Sewer Replacement**	**352 days**	**Mon 1/28/13**	**Tue 6/3/14**	**$1,000,000**	**Not Started**
169	Design	130 days	Mon 1/28/13	Fri 7/26/13		
170	Bidding (2 Months) & Construction	200 days	Wed 8/28/13	Tue 6/3/14		
171						
172	**WATER**	**1190 days**	**Mon 12/7/09**	**Fri 6/27/14**		
173	**CC-1175 Southeast Reservoir & CC-1191 Southeast Transmission Main (Planning Phase Only)**	**793 days**	**Wed 2/17/10**	**Fri 3/1/13**	**$185,000**	**Transmission main alignment study underway.**
174	Study	793 days	Wed 2/17/10	Fri 3/1/13		
175	**CC-1427 Well No. 8 Irrigation Project**	**830 days**	**Mon 2/1/10**	**Fri 4/5/13**	**$100,000**	**Design scope may change based on Talbert Lake scope change.**
176	Design	785 days	Mon 2/1/10	Fri 2/1/13		
177	Permits (Building, and may need DPH & OCWD approval)	350 days	Mon 12/5/11	Fri 4/5/13		
178	**CC-1467 Security Improvements**	**520 days**	**Mon 10/3/11**	**Fri 9/27/13**	**$500,000**	**Ongoing throughout year.**
179	Construction	520 days	Mon 10/3/11	Fri 9/27/13		
180	**CC-1420 Peck Reservoir Dual Drive**	**1065 days**	**Mon 3/1/10**	**Fri 3/28/14**	**$1,575,000**	**Design underway. Working on power issue with SCE.**
181	Conceptual Study	355 days	Mon 3/1/10	Fri 7/8/11		
182	Final Design	426 days	Mon 7/11/11	Mon 2/25/13		
183	Construction	175 days	Mon 7/29/13	Fri 3/28/14		
184	**Well #9 GAC Filtration**	**775 days**	**Mon 3/15/10**	**Fri 3/1/13**	**$250,000**	**Engineering studying alternate ways for filtration**
185	Conceptual Study	775 days	Mon 3/15/10	Fri 3/1/13		
186	**CORROSION CONTROL**	**575 days**	**Mon 8/15/11**	**Fri 10/25/13**		
187	**CC-1330 Corrosion Protection 36" Steel on Springdale. Paving from North City Limit to Warner**	**575 days**	**Mon 8/15/11**	**Fri 10/25/13**	**$6,000,000**	**Under Construction**
188	Design	220 days	Mon 8/15/11	Fri 6/15/12		
189	Construction	260 days	Mon 10/29/12	Fri 10/25/13		
190	**WATER MAIN REPLACEMENT**	**775 days**	**Mon 7/11/11**	**Fri 6/27/14**		
191	**CC-1412 Water Main Replacement @ Sunset Beach Area - Phase I**	**208 days**	**Tue 11/13/12**	**Thu 8/29/13**	**$800,000**	**Under Construction**
192	Construction	208 days	Tue 11/13/12	Thu 8/29/13		
193	**CC-1429 Water Main Replacement @ Sunset Beach Area - Phase II**	**775 days**	**Mon 7/11/11**	**Fri 6/27/14**	**$600,000**	
194	Final Design	430 days	Mon 7/11/11	Fri 3/1/13		
195	Construction	235 days	Mon 8/5/13	Fri 6/27/14		
196	**CC-1432 Cast Iron Pipe Replacement@Various Locations Downtown**	**409 days**	**Wed 8/1/12**	**Mon 2/24/14**		
197	Final Design	193 days	Wed 8/1/12	Fri 4/26/13		**Expecting categorical exemption with Coastal Commission**
198	Construction	146 days	Mon 8/5/13	Mon 2/24/14		
199	**WATER MASTER PLANNING STUDIES**	**555 days**	**Mon 11/1/10**	**Fri 12/14/12**		
200	**Update to the Water Master Plan**	**555 days**	**Mon 11/1/10**	**Fri 12/14/12**	**$350,000**	**Study completed, awaiting commission and council approval**
201	Study	555 days	Mon 11/1/10	Fri 12/14/12		
202	**WATER SYSTEM RELIABILITY STUDIES**	**845 days**	**Mon 12/7/09**	**Fri 3/1/13**		
203	**Study Elimination of Potential Choke Points Near Overmyer Reservoir**	**845 days**	**Mon 12/7/09**	**Fri 3/1/13**	**$75,000**	**Study underway**
204	Study	845 days	Mon 12/7/09	Fri 3/1/13		
205	**Study to Create Potential Redundancy of the Northern End of the 36" Main OC-35**	**825 days**	**Mon 1/4/10**	**Fri 3/1/13**	**$75,000**	**Study underway. Need field testing during Summer 2012.**
206	Study	825 days	Mon 1/4/10	Fri 3/1/13		



CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
REQUEST FOR ACTION

Item No. PW 12-29

SUBMITTED TO: Chairman Herbel and Members of the Commission

SUBMITTED BY: Travis K. Hopkins, PE, Director of Public Works

DATE: October 17, 2012

SUBJECT: Garfield Avenue Arterial Street Rehabilitation Project, from Magnolia Street to Bushard Street, and Goldenwest Street, from PCH to Yorktown Avenue, CC-1433

Statement of Issue: Plans and Specifications for Street Rehabilitation Project CC No. 1433 for Garfield Avenue, from Magnolia Street to Bushard Street, and Goldenwest Street, from Pacific Coast Highway to Yorktown Avenue, are in final preparation with Notice inviting Sealed Bids anticipated advertising in January 2013. Staff requests recommendation of the project to the City Council.

Funding Source: Funds include the amounts of $1,133,000, budgeted in Prop 1B Grant Account No. 21890010.82300, $1,167,000, budgeted in Measure M Account No. 21390020.82300, and $405,000, budgeted in the Capital Improvement Reserve Account No. 10040314.82800. Reimbursements include approximately $145,000 from CalRecycle and $72,000 from a Cooperative agreement with Fountain Valley for their pavement portion on Garfield Avenue. The engineers cost estimate for the project is $2,500,000.

Impact on Future Maintenance Costs: No additional costs are anticipated.

Recommended Action: Motion to recommend to the City Council, approval of Garfield Avenue Street Rehabilitation, from Magnolia Street to Bushard Street, and Goldenwest Street Rehabilitation, from Pacific Coast Highway to Yorktown Avenue, CC 1433.

Alternative Action(s): Deny approval and recommend an alternative action.

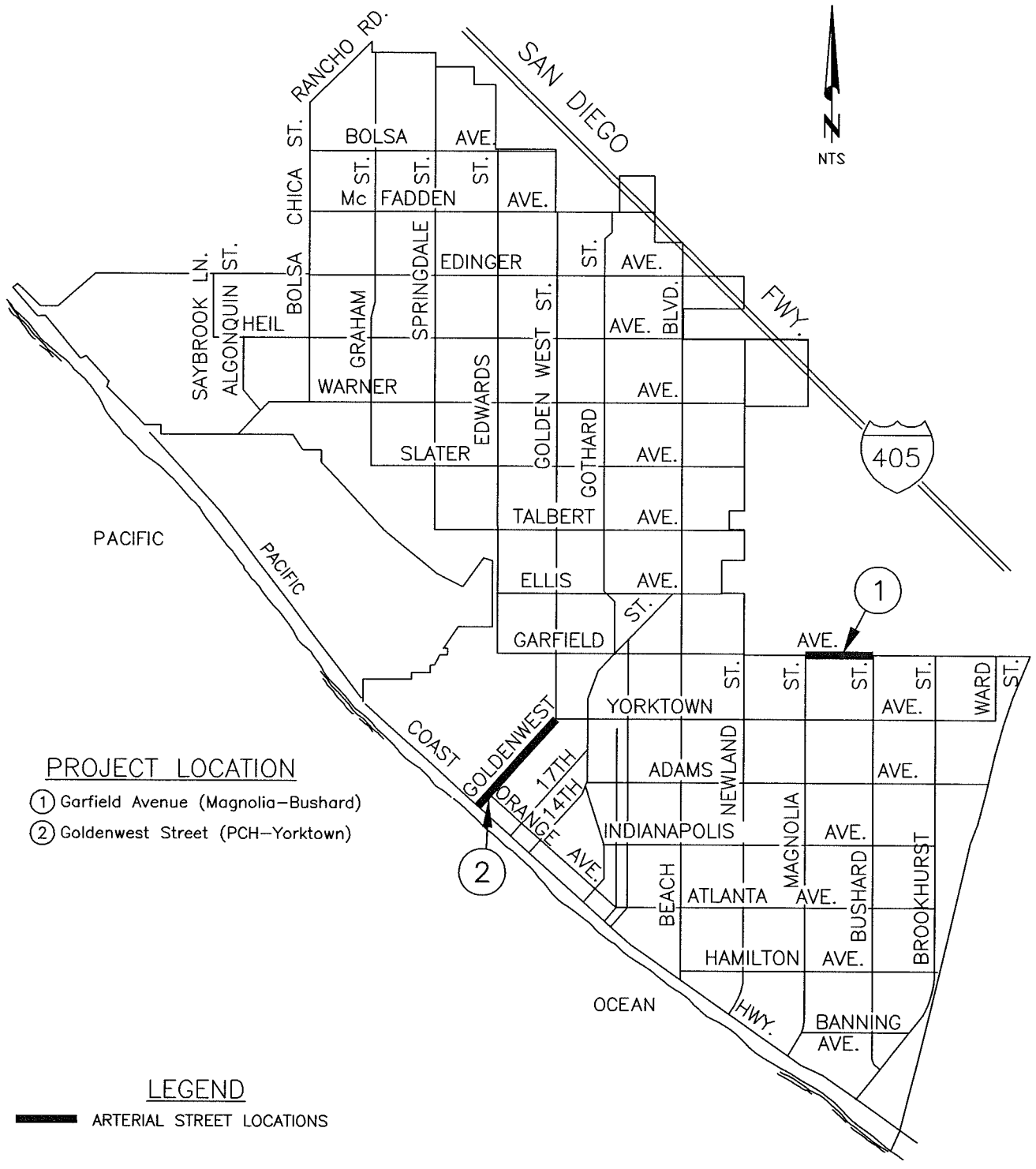
Analysis: The project locations are as stated above. The projects consist of asphalt rehabilitation by conventional methods by grinding the existing pavement, removing failed roadway sections, and overlaying the street with rubberized asphalt concrete or by full depth reclamation. Manholes, monitoring wells, survey monuments, and water valve assemblies will be adjusted to grade

and traffic loops and striping will be replaced. Improvements also include limited replacement of concrete curb, gutter, sidewalk, and access ramps where needed. Both streets have an average PCI of 54 and were last rehabilitated between 1989 and 1992.

Attachments:

1. Project Location Map

ATTACHMENT #1



REV 7/3/12

FY 12/13 ARTERIAL HWY. REHABILITATION, CC–1433
PROJECT LOCATION MAP

CITY OF HUNTINGTON BEACH

DEPARTMENT OF PUBLIC WORKS

CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
REQUEST FOR ACTION

Item No. PW 12-30

SUBMITTED TO: Chairman Herbel and Members of the Commission

SUBMITTED BY: Travis K. Hopkins, PE, Director of Public Works

DATE: October 17, 2012

SUBJECT: Lambert Park Slope Repair, CC-1337

Statement of Issue: Plans and specifications for the Lambert Park Slope Repair, CC-1337 are in final preparation. Staff is seeking support for the project and the initiation of the competitive bid process.

Funding Source: Funds in the amount of $350,000 are budgeted in Capital Projects Account No. 10040314.

Impact on Future Maintenance Costs: No anticipated impact on future maintenance costs as this project proposes to repair an existing slope.

Recommended Action: Motion to recommend to the City Council approval of the Lambert Park Slope Repair, CC-1337.

Alternative Action(s): Deny approval and recommend an alternative action.

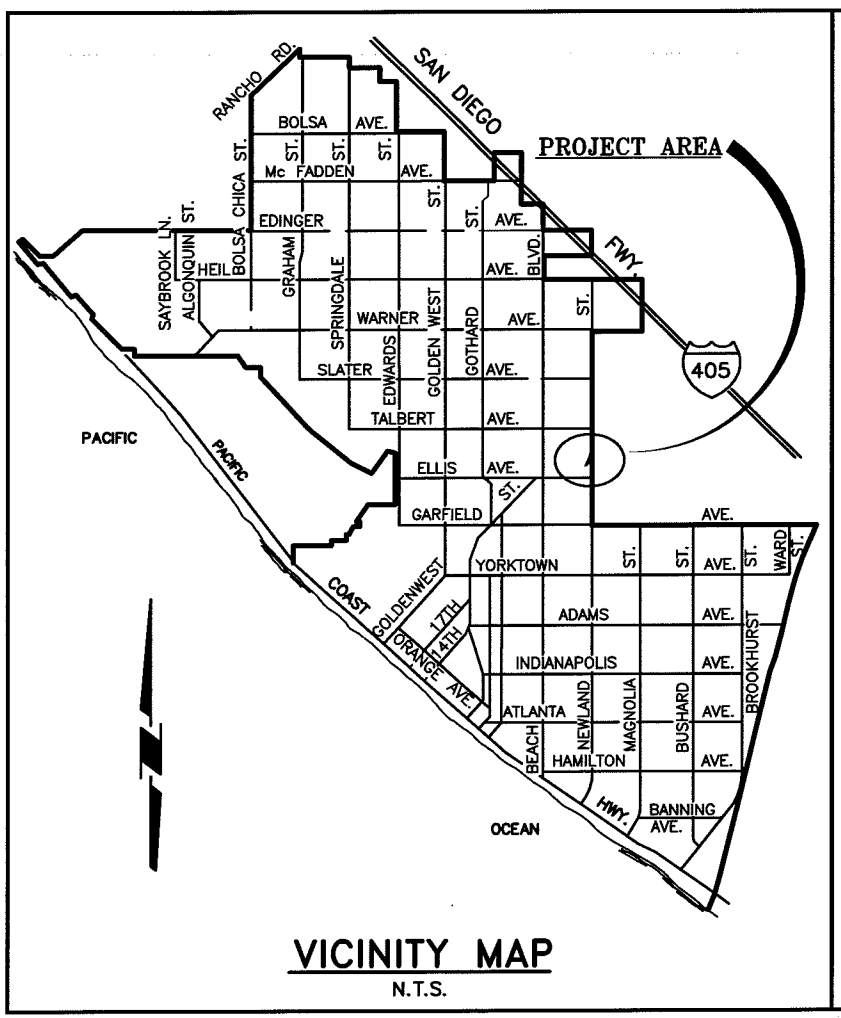
Analysis: A portion of the existing slope within Lambert Park, located at 18321 Newland Street, experienced a surficial slope failure in June 2006. A geotechnical analysis has determined that the proposed method of repair will provide an acceptable factor of safety against a future slope failure due to either static or seismic loading. The project will reconstruct, and geotechnically stabilize approximately 8,000 sq. ft. of the most critical area of the slope and minimize the potential for future slope failure in this area.

Attachments:

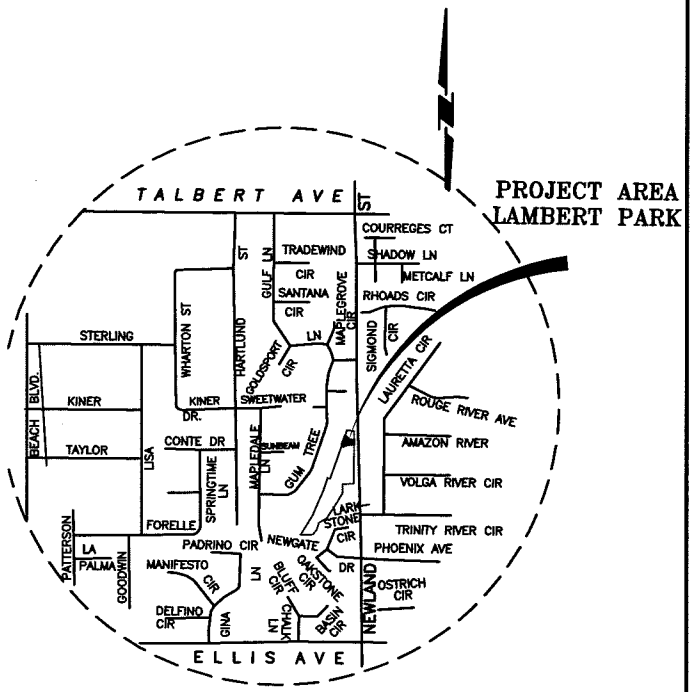
1. Project Location Map

ATTACHMENT #1

LAMBERT PARK SLOPE REPAIR, CC-1337



VICINITY MAP
N.T.S.



LOCATION MAP
N.T.S.

PROJECT LOCATION MAP

CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
REQUEST FOR ACTION

Item No. PW 13-01

SUBMITTED TO: Chairman and Members of the Commission

SUBMITTED BY: Travis K. Hopkins, PE, Director of Public Works

DATE: January 16, 2013

SUBJECT: 2012 Water Master Plan and Financial Plan

Statement of Issue: Beginning in 2011, staff and consultant began work on an update of the Water Master Plan and Financial Plan. The final plan is presented for the Commission's recommendation to the City Council.

Funding Source: Funding for the update and for the projects recommended therein is provided in the Water Fund (506).

Impact on Future Maintenance Costs: N/A

Recommended Action: Motion to recommend to the City Council the adoption of the 2012 Water Master Plan and Financial Plan.

Alternative Action(s): Do not recommend adoption of the plan.

Analysis: The original Water Master Plan was adopted in 1988 as a tool to assist in planning for adequate water service to keep pace with growth and to correct system deficiencies. The plan was originally unfunded and was supplemented in 1990 and 1993. In 1995, the plan was updated and a financing plan was put in place to fund the identified capital projects on a pay-as-you-go basis. Per prudent engineering practices, water master plans should be revisited and updated from time to time. In 2005, an update of the plan was completed and adopted by Council in June of 2006. Beginning in 2011, staff and consultant began work on another update. The 2012 Water Master Plan and Financial Plan are scheduled to be presented at a study session to Council on January 22, 2013, follow by a regular Council meeting on February 4, 2013.

Attachments:
1. Powerpoint Presentation
2. 2012 Water Master Plan & Financial Plan

ATTACHMENT #1

City of Huntington Beach

Water Master Plan (WMP) & Financial Plan (FP)

December, 2012

Prepared by:

Psomas (Primary Consultant)

ID Modeling (Hydraulic Modeling Subconsultant)

Raftelis Financial Consultants (Financial Subconsultant)

Overview

- Purpose
- City Characteristics and Projected Growth
- Water Demand
- Water Supply and Reliability
- Storage and Emergency Supply
- Water Transmission and Distribution System Modeling
- Capital Improvement Program
- Financial Plan

Purpose

Purpose of Water Master Plan (WMP)

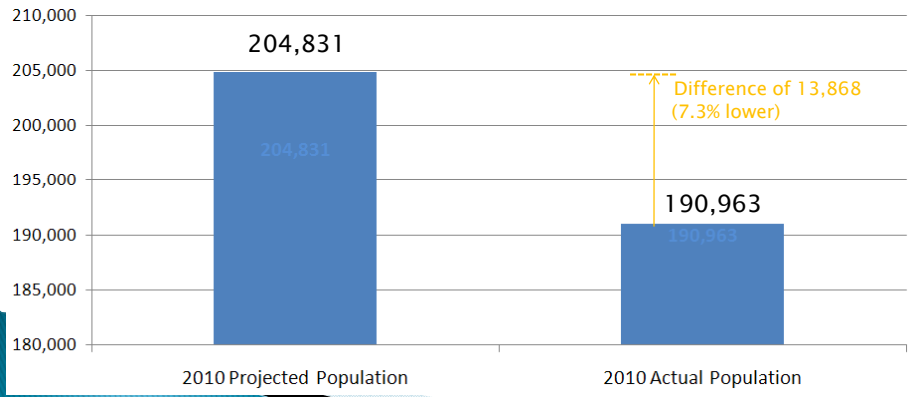
- Last updated in March 2006
- Evaluates future water system needs for 2010 to 2035 (City growth, water demands, water supply and reliability, water quality, water storage, emergency water supply, and water system distribution)

Purpose of Financial Plan (FP)

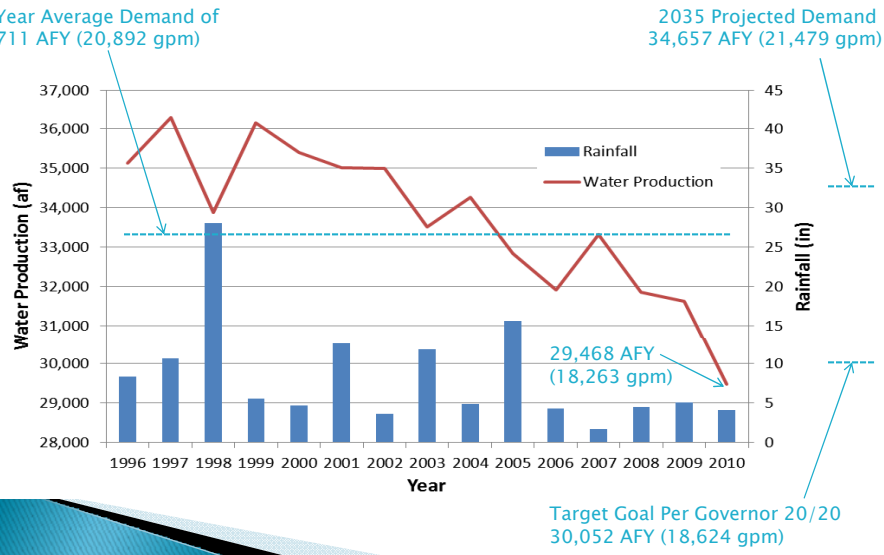
- Evaluate costs of remaining projects
- Scheduling and funding of remaining projects
- Scenario with desalination

City Characteristics & Projected Growth

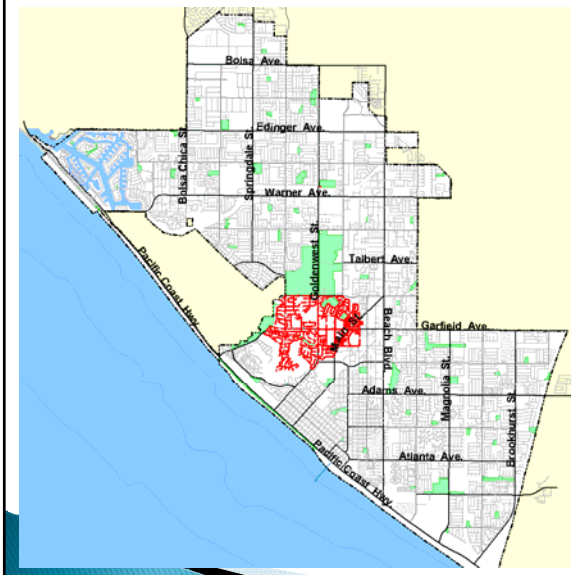
- 17,234 Acres, only 2.2% (376 acres vacant)
- Beach-Edinger Corridors Specific Plan and the Downtown Area Specific Plan



Water Demand Trend



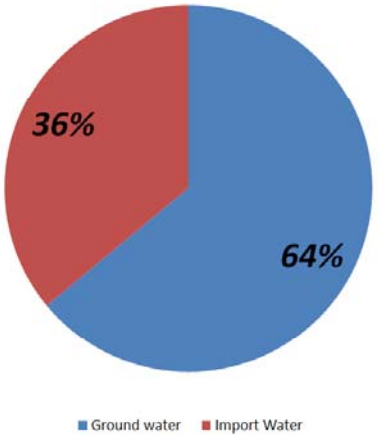
Maximum Day Demand

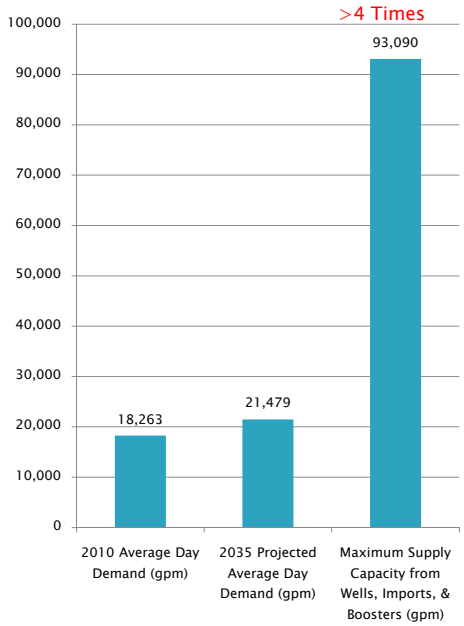


Maximum Day Demand

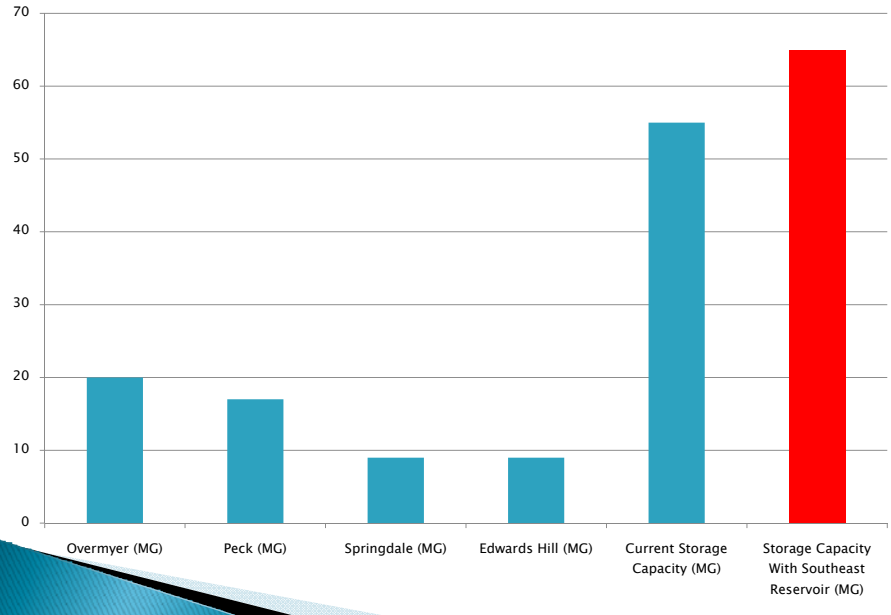
- Considers peak summer demand
- Use of hydraulic model
- Use industry criteria, fire, etc.

Supply Capacity





Reservoir Capacity



Emergency Storage Capacity

Water Agency	Emergency Storage (# Days Average Demand)
City of Huntington Beach	
Without Southeast Reservoir (2015 demand)	1.2
With Southeast Reservoir (2015 demand)	1.6
Respondents to 2001 City of Huntington Beach Survey	
City of Phoenix	1.9
City of Tucson	2.6
City of Anaheim	0.5
City of Pomona	1.5
City of Azusa	0.6
Palmdale Water District	2.1
Seattle Public Utilities	1.5
City of Sacramento	0.5
City of Garden Grove	1.1
City of Inglewood	1.4
City of Santa Ana	0.4
City of Hawthorne	0.7
City of Torrance	0.7
City of San Diego	0.4
Otay Water District	0.6
City of Sacramento	2.1
From Published Water Master Plans	
Irvine Ranch Water District	1.8
Capistrano Beach Water District – 1997	0.5
City of Tustin – 2000	0.4
City of Westminster – 1999	0.3
Yucaipa Valley Water District	2.0
City of Ontario	1.0

Average of 1.1 days

Next Steps

- Complete Remaining WMP Projects
- Well Assessment Study

Projects Completed Since 2005

- 3.5 miles of Transmission Mains
- Beach Blvd – 1,150 LF of 12-inch
- Chlorination Upgrades for Well #13
- Energy Backup System for Well #6, 9, & 10
- Corrosion Protection for 2 miles of 42-inch Main
- Corrosion Protection for 3.5 miles of 30-inch Main
- Fire Protection Improvements -620 LF of 12-inch
- Cast Iron Main Replacement (~26,400 LF)

CIPs Remaining (~$38 million)

- Beach Blvd – 1,400 LF of 12-inch
- Corrosion Protection 2.5 miles of 36-inch Main
- Permanent Wellhead Facilities for Well #13
- Southeast Reservoir and Booster Pump Station
- Southeast Reservoir Transmission Main (4 miles)
- Fire Protection Improvements (700 LF of 8 and 12-inch)
- Cast Iron Main Replacement (2,000 LF Remaining)
- Well #1 Re-Drill

Financial Plan

- Beginning Balance & Revenues
  - Water Master Plan
  - Water Fund
- CIP
  - With Southeast Reservoir/Booster Expense
  - Without Southeast Reservoir/Booster Expense

Beginning Balance & Revenues

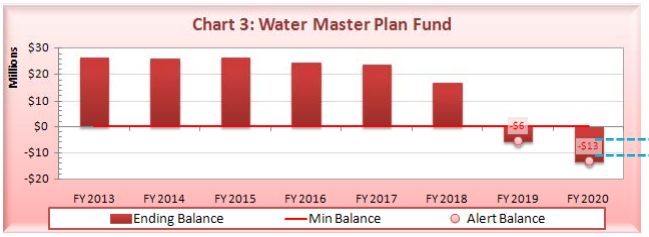
Water Master Plan Fund

- Beginning balance for the Water Master Plan Fund is $27.6M for FY 2012
- Revenues for FY 2012
  - Project Connection Fees: $200K
  - Interest Income: $300K

Water Fund

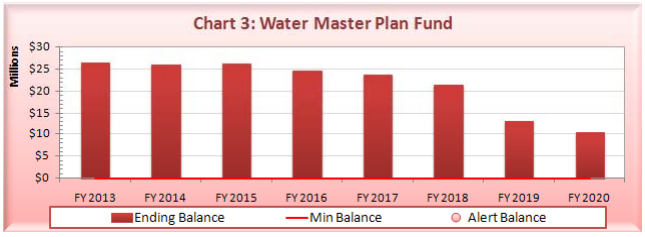
- Beginning balance for the Water Fund is $35.9M for FY 2012

Project Fund Balance (W/SE Reservoir Expense



- Assumes Southeast Reservoir/Booster Constructed from 2018
- Assumes cost to rise 3.5% annually
- Assumes Water Fund will cover the $13 million shortfall in the Water Master Plan Fund

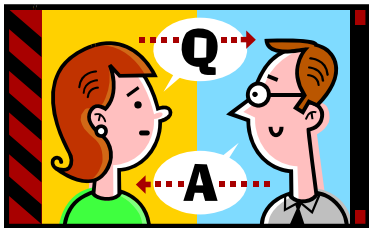
Project Fund Balance (W/O SE Reservoir Expense



- Assumes Southeast Reservoir/Booster Built by others as a desalination project
- Assumes cost to rise 3.5% annually
- Assumes Water Master Plan Fund will have $10.5 million surplus, and can be combined with Water Fund (W/City Council Approval)

Water Master Plan & Financial Plan

Discussion



THANK YOU

ATTACHMENT #2

2012 Water Master Plan and Financial Plan Update

for the City of Huntington Beach

PSOMAS

In association with

IDModeling

Raftelis Financial Consultants

CITY OF HUNTINGTON BEACH
WATER MASTER PLAN AND FINANCIAL PLAN UPDATE

December 2012

Prepared for:
CITY OF HUNTINGTON BEACH
2000 Main Street
Huntington Beach, CA 92648

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Project No. 2HUN011701

In Association with IDModeling & Raftelis Financial Consultants

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EXECUTIVE SUMMARY

ES.1 Purpose

The purpose of this report is to update the City's water master plan and water financing plan, which were last updated in March 2006 (2005 Water Master Plan and Financing Plan).

The Water Master Plan evaluates the water system performance and facilities for the planning period 2010 through 2035, consistent with the City's 2010 Urban Water Management Plan submitted to and approved on February 23, 2012 by the State Department of Water Resources. The project includes the evaluation of City growth, water demands, water supply and reliability, water quality, water storage, emergency water supply, energy use and recovery, and water system distribution.

The Water Financial Plan evaluates the costs, scheduling and funding of projects remaining to be paid for in the City's Water Master Plan Capital Improvement Program (CIP). These projects were recommended in previous City water master plans. The Water Financial Plan also evaluated the scenario whereby the potential desalination project is implemented and this source of supply becomes available to the City and other agencies in the area.

ES.2 City Characteristics and Projected Growth

Of the 17,234 acres of land within the City of Huntington Beach boundaries including the community of Sunset Beach, which has always been served by the City water system but was only recently annexed, only 2.2% of the City remains as vacant land (376 acres). It is anticipated that all of this land will be developed ultimately with the exceptions of land to be left vacant per City Specific Plans and vacant land in the open space conservation category. Additionally, some portions of the City's existing land use will have their densities intensified, specifically including the Beach-Edinger Corridors Specific Plan and the Downtown Area Specific Plan.

The City's population is projected to increase 10.4% from 204,831 in 2010 to 226,178 in 2035, with total dwelling units increasing from78,664 to 87,029 (10.7%) over the same twenty-five year period. Historical and projected water service area population and housing for the City's 2010 Urban Water Management Plan (UWMP) and this master plan was based on the Center for Demographic Research (CDR) at California State University Fullerton Orange County Projections (OCP) 2010 data adjusted for the Downtown and Beach and Edinger Areas. However, it should be noted that since the preparation of the City's 2010 UWMP, the 2010 Census data has been released. As with most cities in the State, both Huntington Beach and Sunset Beach populations were reported substantially less than the CDR's OCP 2010 data. According to the 2010 Census data, the 2010 population for the City was 189,992 and for Sunset Beach was 971, for a total water service area population of 190,963. One primary factor behind this lower projection was vacancy rates, which were reported at 4.8% for the City and 19.7% for

Sunset Beach, when the City's vacancy rate was reported at 2.65% in the 2005 Water Master Plan.

ES.3 Water Demand

City water demands have not changed significantly over the past 15 years even though development has occurred and the City's population has increased. City potable water supply for the 15 water years 1995/96 through 2009/2010 averaged 33,286 acre-feet per year (AFY). Note that a water year is July through June, whereas the City's fiscal year runs October through September. Based on the City's 2005 Water Master Plan, unaccounted-for water, which is the difference between water supply and water consumption, averaged 6.4%. During the five year period from 2005/06 to 2009/10, unaccounted-for water has averaged 5.4%. In 1995/96 unaccounted-for water was 9.9% and has been reduced due to a leak detection survey and comprehensive program of water main replacements undertaken by the City. The current rate of unaccounted-for water is commendable for a system the size, age, and complexity of the City's.

Total water use per person in the City has historically been less than total water use per person in Orange County. For comparison, Municipal Water District of Orange County (MWDOC) reported total water use in their service area for 2009/10 of 485,311 AFY serving a population of 2,300,021, which equates to 0.211 acre-feet per person. During the same period, the City of Huntington Beach's usage was 29,468 AFY serving a population of 204,831 or 0.144 acre-feet per person for the same period.

Existing Water Demand

City domestic water supply averaged 32,367 AFY (28.9 million gallons per day (MGD) or 20,069 gallons per minute (gpm)) over the three-year period 2005/06 through 2007/08 and this could be taken to be the average or normal year "existing" water system demand. This period is used because it is relatively current but prior to the nearly two-year Metropolitan/MWDOC mandated water conservation initiated in 2008/09 due to the prolonged drought of that time. This value was the average water use reported for a normal year in the City's 2010 UWMP.

Projected Water Demand

For projecting future average water use in the 2010 UWMP, development and population projections were used from the 2010 OCP assembled by the CDR as obtained from the City's Planning Department staff. These data were updated to include some additional development statistics not included in the OCP developed by City Planning staff. Using these projections, the 2035 water demand is projected to be 34,657 AFY or approximately 30.9 MGD, 7.1% higher than the assumed 2010 normal year demand of 32,367 AFY. This increased water demand equates to an annual water demand growth of approximately 0.27% per year, compounded annually.

Maximum Day Demand (MDD) is the highest daily demand over the year and is important in water master planning in that an agency must have an adequate supply capacity to meet this MDD from supply sources. Demands above the MDD including

peak hour demands and fire flows are met from storage facilities such as reservoirs. The City's MDD is generated using a factor of 1.8 times the average annual demand based on analysis of existing historical use patterns. The 28.9 MGD or 20,069 gpm of ADD used as the existing normal year demand equates to a MDD of 52.0 MGD or 36,124 gpm. For 2035 or Build-out, the projected 30.9 MGD or 21,489 gpm equates to a MDD of 55.6 MGD or 38,680 gpm.

ES.4 Water Supply and Reliability

City water supply has historically come from groundwater production and from supplemental, treated, imported water purchased from MWDOC, which is a member agency of the Metropolitan Water District of Southern California (MWD).

As a member agency of OCWD, the City is entitled to produce groundwater from the Basin. The Basin, which is managed by OCWD, is unadjudicated. The City and other Basin producers pay a Replenishment Assessment (RA) to OCWD for all groundwater produced up to a percentage of the producer's total water supplies used to meet demands. This percentage is called the Basin Production Percentage (BPP), which is set uniformly for all producers annually by OCWD based on Basin conditions and long-term projections.

For FY 2011/12, OCWD increased the BPP from 62% to 65% where it was for the previous few years due to drought conditions and low Basin levels. The RA is currently set at $254/acre-foot.

In addition to the RA, OCWD charges a Basin Equity Assessment (BEA) for pumping in excess of the BPP, which is basically a penalty to help maintain the Basin at projected levels. The BEA, which is set at $512/acre-foot for FY 2011/12, essentially equates the cost of groundwater pumped over and above the BPP to the rate charged for imported water from MWDOC. BEA rate will vary slightly between different member agencies of OCWD, as the rate is adjusted based on each member agency's groundwater pumping costs.

It benefits the City to use groundwater up to the maximum allowable BPP because groundwater is less expensive and more reliable than imported water. The City's (FY 2011/12) cost for producing groundwater up to the BPP is $290/acre-foot (including the RA and energy but not including other well operation and maintenance costs). The City supplements groundwater with treated, imported water from MWDOC at the current rate of $798.25/acre-foot exclusive of connection charges, readiness to serve charges, and other fixed fees.

The City's water supply has averaged 64% groundwater pumped and 36% imported water purchases over the recent six year period (2004/05 to 2009/10). It should be noted, however, that the City participates in the In-Lieu or Cyclic Storage Program offered by OCWD and MWD, when available. This is a groundwater program that refills the Basin by avoiding pumping from the Basin, and is usually offered in the wetter years and in the lower demand period of October through April. In-lieu imported water purchases have

been approximately 7% of the total city water supply over this six year period, from a high of 6,850 acre-feet peryear to 0 acre-feet peryear, with imported water purchases not applicable to this program at approximately 29% for total imported water purchases of 36%. Therefore, for purposes of determining the BPP, the in-lieu water is not counted and the City's BPP is 71% (100-29) over this period.

The City has a current well supply capacity of approximately 25,050 gpm from ten existing wells. However, the normal operating capacity of these existing wells is approximately 18,150 gpm or 72% of total capacity. The reason the normal operating capacity is less than total capacity is that some of these wells are not operated at 100% of capacity in consideration of such factors as groundwater level, water quality, availability of in-lieu water, etc. Additionally, the life of the wells and associated supply equipment can be prolonged when operating at less than full capacity.

The City is fortunate to overly the Orange County Groundwater Basin (Basin), which has been able to sustain BPPs from the mid-60s to 70 percent throughout past years. During preparation of the City's 2010 UWMP, Orange County Water District who manages the Basin conservatively projected that a BPP of 62 percent could be maintained throughout the next twenty-plus years. This means that the City can reasonably count on at least 62 percent of its projected demands being met by local groundwater produced from City wells overlying the Basin. However, due to current favorable basin conditions, the continuing move toward water conservation, and the expanded GWRS projections, OCWD staff has indicated that they are looking to increase the BPP to 68% for 2012/13 and feels that agencies could easily use 65% as a conservative BPP projection for long-term planning.

An analysis of the City's current wells ability to meet a BPP of 65% with projected 2015 (near term) and 2035 (build-out) demands was conducted using normal operating capacities of the wells and historical demand patterns by month and the result is that without running the wells beyond the normal operating capacity for long periods of time in the summer months there could be reliability issues if one or more wells are down for any reason. If this occurred, the City could still meet these maximum monthly demands by utilizing additional quantities of imported water and could potentially still catch up to the BPP by pumping more in the winter months. However, it is recommended that a well study be conducted to analyze this in more detail as well as evaluate the condition of all existing wells and their remaining useful life, potential water quality issues that could relate to high chloride levels in the vicinity of three of the City's wells near the Peck/Springdale Reservoir complex, and the potential need for replacement wells or new wells at new sites altogether in the future.

With the potential addition of the potential seawater desalination plant at the AES Huntington Beach Generating Station property and the ability of the City to draw supply from this source, the overall water supply reliability of the City would be enhanced. However, this will not increase City's ability to draw groundwater from the Basin, which appears to be a potential future need. However, based on the City's 2010 UWMP and this water master plan update, the City's existing water supply sources are deemed adequate

and reliable into the future to at least 2035, even without considering the potential desalination project.

Water Quality

The City's water supply, made up of groundwater and imported treated surface water, consistently meets or exceeds all State and federal potable water quality standards. Recently adopted and proposed federal and State water quality regulations on the horizon including a new lower maximum contaminant level (MCL) for arsenic, an upgraded rule for groundwater disinfection, a MCL for radon, new monitoring requirements for disinfectant byproducts, and a MCL for hexavalent chromium are not expected to affect the City's ability to meet future water quality standards based on historic water quality parameters of the City's supply sources and the City's current disinfection procedures. However, the City will need to monitor proposed radon regulation with regard to which radon mitigation program the State opts to follow.

ES.5 Storage and Emergency Supply

The City currently has 55.0 MG of storage capacity located at the Overmyer, Peck, Springdale and Edwards Hill reservoirs. Booster Stations are located at the Overmyer, Peck/Springdale, and Edwards Hill sites to pump water from the reservoirs into the Zone 1 distribution system at appropriate pressures. The Reservoir Hill Booster Pump Station, which is located at the Overmyer site, boosts water from Zone 1 into Zone 2. Zone 2 does not have the capability to directly pump from a storage reservoir. In addition to pumping to Zone 1, the Edwards Hill Booster Pump Station also boosts water into Zone 2.

As recommended in the City's last two master plans, a 10 MG storage reservoir, the Southeast Reservoir, and a 11,000 gpm booster pump station is proposed in the southeast quadrant of the City at the AES property to ensure water supply reliability and storage for the area south of the Newport-Inglewood Fault and south of Bolsa Chica. Currently there are no storage reservoirs or supply sources located south of the fault and an earthquake on this fault could potentially sever water transmission and distribution pipelines crossing the fault leaving the southern portion of the City without potable water. With construction of this Southeast Reservoir and Booster Pump Station, the City will have 65.0 MG of storage capacity. Along with the potential construction of the desalination plant, this project will also include the construction of a reservoir and booster pumping station on the AES site, which could provide the needed reliability south of the fault and allay the requirement for the City to construct these facilities.

The City's existing storage volume is more than adequate for all operational and the highest fire flow demand in either of the two pressure zones. Emergency storage is calculated after required operational and fire flow volumes are depleted. Using this methodology, the City has 1.23 days of emergency storage volume at existing demands and 1.16 days at projected year 2035 average demand. With the addition of the 10.0 MG Southeast Reservoir, the City would have 1.58 days of existing demand and 1.48 days of projected 2035 demand in storage. These emergency storage volumes place the City approximately in the middle of 24 water agencies surveyed by the City's Department of

Public Works in 2001, after removing the highest and lowest of the 24, as shown on Table 5-3.

Backup water supply can augment storage during certain specific emergency water supply scenarios. In this regard, several different emergency storage/supply scenarios were evaluated including a complete loss of the City's imported water supply coupled with a 7-day electrical power outage.

Likely causes for an imported water outage or reduction in supply could be a break in an imported water transmission main or mains or an outage at a water treatment plant caused by an earthquake or other event. It was determined that the City has sufficient emergency storage, groundwater supply, and emergency power to withstand an imported water outage of 31 days or longer coupled with an electric power outage lasting the first 7 days of this emergency scenario.

Another possible emergency scenario is a complete loss or reduction in the City's groundwater supply from the Orange County Groundwater Basin, conceivably as a result of Basin groundwater contamination. It was determined that the City has sufficient emergency storage and imported water supply capacity to withstand this emergency scenario as well.

ES.6 Water Transmission and Distribution System Modeling

The City's existing hydraulic network model was originally created by the City in 1998 to analyze the City water transmission and distribution system performance. This model has been updated and refined over the years. For this master plan, the latest model was provided by City staff at the outset of the project. The model is in WaterCAD format and is compatible with Water GEMS modeling software by Bentley Systems. The model is used routinely by City staff and contains numerous scenarios. It contains all pipes in the existing water distribution system, and several demand allocations including those representing existing and estimated future demand conditions for average day, maximum day, and peak hour demands.

Existing demands were first revised to correspond to the reduced demands experienced over the past few years, as consistent with the City's 2010 UWMP. Then a series of validation analyses were conducted to verify that the model adequately simulated observed operating conditions within the distribution system.

Hydraulic analyses conducted for this project used the existing system model to create a series of extended period simulation (EPS) analyses using a representative typical week of diurnal curves from June 2007. These demand curves were then uniformly increased to reflect conditions that could be expected during a week of maximum demand. Hydraulic analyses were conducted under existing and future year 2035 demand conditions. These hydraulic analyses were then used to confirm or develop sizing on capital improvements and develop system optimization recommendations.

ES.7 Capital Improvement Program

A financing plan was adopted in 1995 to pay for water system project improvements identified in that master plan as well as projects remaining from the 1988 Water Master Plan. The water master plan capital improvement program was last updated through the 2005 Water Master Plan and this plan updates those capital projects based on current and projected system demands, more refined modeling techniques, potential alternative capital projects to the Southeast Reservoir and Booster Station project, the status of the original recommended capital improvement program, and updated cost information.

Remaining Water Master Plan Projects

Water master plan projects that remain to be constructed from the 2005 Water Master Plan and Financing Plan are listed below, identified by their project numbering from previous master plans. Projects for which money has been encumbered prior to May 30, 2012 are not included as a remaining master plan project and those encumbered funds are therefore not included as available.

Project No. 1: Beach Boulevard Pipe Improvements

Dead end pipe segments are to be connected in locations along Beach Boulevard to improve water supply and fire flow reliability to adjacent areas fronting this thoroughfare. Both projects, together, total approximately 1,400 linear feet of 12-inch pipeline. Both of these relatively short connecting pipes will likely involve pipe jacking across Beach Boulevard.

Project No. 9: Pipeline Corrosion Protection Stage II

Corrosion control will be constructed for the 36-inch OC-35 Transmission Main on Springdale Avenue from Glenwood Drive (just outside of Peck and Springdale Reservoirs) to Warner Avenue. Design of this project has been completed, with construction expected to begin in late 2012.

Project No. 12: Permanent Wellhead Facilities for Well No. 13

Well No. 13, a fairly new well, has been operating with temporary facilities. Building a permanent well head enclosure will utilize the existing casing but will include a larger building, new mechanical equipment, improved controls, along with electrical equipment to allow this pump to operate as a hybrid, using electricity as well as natural gas.

Project No. 13: Southeast Reservoir and Booster Pump Station

A 10 million gallon storage reservoir and an 11,000 gpm booster pump station was recommended in the 2005 Water Master Plan in order to increase reliability to this area in the event of a major earthquake along the Newport-Inglewood Fault. As a part of the proposed desalination plant plan, it includes construction of a storage reservoir and a booster pump station that would eliminate the need for the City to construct these facilities. These new facilities would be available to this area in the event of such an emergency situation.

Project No. 14: Southeast Reservoir Transmission Main

A 10,400 linear foot, 36-inch distribution/transmission main will be constructed from the potential desalination booster station or City Southeast Reservoir Booster Pump Station to transmit water to the Downtown Loop. This new line will be interconnected with existing distribution lines along its route to distribute water to the southeast service area. This pipeline segment was undersized in the 2005 Water Master Plan at 16- to 24-inches and needs to be 36-inches in diameter.

Project No. 14A: Southeast Reservoir Transmission Main Extension to Overmyer

Modeling conducted with this current master plan also determined that an additional water transmission pipeline is needed to connect the Southeast Transmission Main to Overmyer Reservoir to handle day-to-day operations and to maintain water quality throughout the system. This additional transmission pipeline should have been included with the previous master plan and will be included as part of this current list of updated master plan projects.

The project involves a 1.5 mile, 36-inch and 0.25 mile 42-inch pipeline extension from the Southeast Reservoir Transmission Main at Atlanta Avenue up Huntington Street to Overmyer Reservoir. Additionally, two pressure regulating stations are needed for the two interconnects to the smaller diameter distribution system pipelines near the proposed Southeast Reservoir site and at the tie-in to the 20-inch Downtown Loop.

This project would, of course, only be constructed in conjunction with or following the construction of the Southeast Reservoir Transmission Main, Project No. 14, above. This new, 1.75 mile transmission main could be operated under system pressure to move water from Overmyer Reservoir to maintain levels in the Southeast Reservoir. Along with the Southeast Booster Station, it could also be operated to back-up Overmyer Reservoir if the reservoir needs to be taken down for maintenance. In the event desalinated water becomes available from the Southeast Reservoir and Booster Station, this line could operate either (1) under system pressure; or (2) under low pressure as a dedicated fill line to Overmyer Reservoir.

Project No. 16: Fire Protection Improvements

To improve fire flow pressures and supply reliability at Peters Landing in Huntington Harbor, approximately 400 linear feet of 12-inch main will be constructed, tying into the 12-inch pipeline in Pacific Coast Highway. To improve fire flow pressures and supply reliability at the high density residential area located east of Beach Boulevard and south of Atlanta Avenue, approximately 300 linear feet of 8-inch water main will be constructed. Design has been completed, with construction expected to be complete by summer of 2013.

Project No. 17: Cast Iron Main Replacement Program

The majority of the cast iron mains within the City Downtown area have been replaced but approximately 2,000 linear feet remain to be replaced with new mains made of non-corrosive pipe materials.

Project No. NA: Well No. 1 Re-drill

This project was included in the 1995 Water Master Plan to increase its capacity to around 750 gpm and since it is likely, following the results of the Groundwater Well Feasibility Study recommended in this master plan, that additional well capacity will be needed in the future, this project is included herein.

These remaining capital projects are shown on Table ES-1 with their estimated design and construction cost and anticipated year of design and construction, in January 2012 dollars.

Table ES-1
Estimated Costs for Remaining Master Plan Projects

Project # from 2005 WMP	Project Name	Estimated Design FY	Estimated Design Cost[a,b]	Estimated Construct. FY	Estimated Construction Cost[a,c]	Total Estimated Cost
1	Beach Blvd. Pipeline Imps.[d]	NA	$ -	2013	$ 700,000	$ 700,000
9	Pipeline Corrosion - II[d]	NA	$ -	2013	$ 1,200,000	$ 1,200,000
12	Well 13 Permanent Wellhead	2015	$ 200,000	2016	$ 1,800,000	$ 2,000,000
13	Southeast Res. & Booster PS	2018	$1,597,000	2019-20	$ 17,648,000	$19,245,000
14	Southeast Res. Trans. Main	2018	$ 503,000	2019-20	$ 5,355,000	$ 5,858,000
14A	New Connection - Overmyer to SE TM	2018	$ 540,900	2019-20	$ 5,409,000	$ 5,949,900
	1.75 mi. 36" to 42" in Huntngtn. St.		*$ 500,300*		*$ 5,003,000*	
	Interconnects @ Overmyer Res.		*$ 25,600*		*$ 256,000*	
	PRVs @ SE Res. & Atlanta/Dwntn Lp		*$ 15,000*		*$ 150,000*	
16	Fire Protection Improvements[d]	NA	$ -	2014	$ 300,000	$ 300,000
17	Cast Iron Main Replacement	2013	$ 200,000	2014	$ 800,000	$ 1,000,000
NA	Well 1 Re-drill	2016	$ 150,000	2017	$ 1,350,000	$ 1,500,000
	Total		**$3,190,900**		**$ 34,562,000**	**$37,752,900**

a) Costs estimates as of January 2012 (LA ENR = 10092). Escalation of design and construction costs will be accounted for in Financial Plan chapter. Project 14A was not included in 2005 Master Plan and total cost includes subtotals in italics.

b) Design Costs range from 5 to 15% of construction costs (except for Project 17 due to extensive potholing), depending on project size and complexity and include preliminary design, final design, potholing, geotechnical, survey, and bidding services.

c) Construction Costs include construction management and City project management. Construction management costs range from 2.5 to 5% of construction costs for shop drawings, RFIs, field visits, etc., but do not include inspection services. City project management costs range from 5 to 9% of construction costs and may include inspection services depending on the project type.

d) Design already complete or costs encumbered.

Recommendations for Additional Studies

Section 3.3.9 of this Water Master Plan recommends a future extensive well study to assess the condition of each of the City's existing wells, determine their remaining useful life, and develop a systematic approach to replacement of wells in their same general location and/or the addition of new wells at future locations. Because the potential desalination project would include construction of a storage reservoir and booster pump station as a part of the desalination project, future projects, including those that may arise from the above study, could be funded from the savings generated from deleting these two major projects from the City's Water Master Plan projects (or from savings on any of the other remaining Water Master Plan projects above).

ES.8 Financial Plan

A Financial Plan Model was developed to analyze ability of the Water Master Plan Fund and its available revenue sources to fund the remaining Water Master Plan CIP included in Section 7. Two scenarios were analyzed; one with and one without the expenditure for the Southeast Reservoir and Booster Pump Station (Southeast Reservoir) being funded by the City, as discussed in the CIP section of this report.

Beginning balances for the Water Master Plan Fund as well as projected revenue from interest income were generated. Revenue projections from Capital Facilities Charges (connection fees) were developed by year for an eight year period (FY 2013 through FY 2020), based on population and development projections from the City's 2010 Urban Water Management Plan. The estimated project costs from the CIP included in Table ES-1 were input into the model for each scenario along with allowances for inflation due to deferred construction at a realistic long term rate of 3.5% per year (compounded).

The financial Pro Forma for each scenario is summarized in Tables ES-2 and ES-3 on the following page. Table ES-2 shows the Water Master Plan Fund Pro Forma with the Southeast Reservoir Expense being funded by the City and Table ES-3 shows the Pro Forma with the Southeast Reservoir Expense being funded by a third party.

As shown in Table ES-2 representing the scenario with the Southeast Reservoir expense funded by the City, there are significant CIP expenditures in FY 2018 through FY 2020 with almost 25 million in future (inflated) dollars in FY 2019. Using the Financial Plan Model, it is projected that there will be available funds in the Water Fund to cover the shortfall in the Water Master Plan Fund during the study period. As shown in Table ES-2, fund transfers are necessary in FY 2019 and FY 2020, totaling approximately $13.4 million because total expenditures for the Water Master Plan Fund under this scenario are larger than the projected balances. These transfers ensure the CIP projects are funded and that the Water Master Plan Fund balances remain healthy. The ending balance of $0 at the end of the study period is appropriate because all of the CIP projects will be complete, and the Water Master Plan Fund can be closed out.

Table ES-3 illustrates the financial position of the Water Master Plan Fund under the CIP scenario where the City does not fund the Southeast Reservoir. Under this scenario, the CIP expenditures during the last three years are significantly less, the reserves remain healthy, and the City will not need any transfers from the Water Fund. Under this scenario, the City could opt to transfer the remaining funds, totaling approximately $10.5 million from the Water Master Plan Fund to the Water Fund, which will require a revision to City's existing ordinance to address the transfer of any excess in the Water Master Plan Fund to the Water Fund.

Table ES-2

Water Master Plan Fund Pro Forma with Southeast Reservoir Expense

	FY 2013 Projected	FY 2014 Projected	FY 2015 Projected	FY 2016 Projected	FY 2017 Projected	FY 2018 Projected	FY 2019 Projected	FY 2020 Projected
Beginning Balance	**$28,148,928**	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$16,789,376**	**$0**
Capital Facilities Charges	$200,735	$201,472	$202,213	$203,328	$204,450	$205,578	$206,713	$207,853
CIP Expenditure	($2,100,000)	($1,138,500)	($214,245)	($2,162,000)	($1,549,156)	($7,376,221)	($22,903,166)	($7,901,592)
Interest Income	$355,337	$335,921	$328,365	$332,351	$311,901	$298,917	$212,487	$0
Transfer from (to) the Water Fund	$0	$0	$0	$0	$0	$0	$5,694,590	$7,693,739
Ending Balance	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$16,789,376**	**$0**	**$0**

Table ES-3

Water Master Plan Fund Pro Forma without Southeast Reservoir Expense

	FY 2013 Projected	FY 2014 Projected	FY 2015 Projected	FY 2016 Projected	FY 2017 Projected	FY 2018 Projected	FY 2019 Projected	FY 2020 Projected
Beginning Balance	**$28,148,928**	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$21,360,781**	**$13,128,528**
Capital Facilities Charges	$200,735	$201,472	$202,213	$203,328	$204,450	$205,578	$206,713	$207,853
CIP Expenditure	($2,100,000)	($1,138,500)	($214,245)	($2,162,000)	($1,549,156)	($2,804,816)	($8,708,954)	($3,004,589)
Interest Income	$355,337	$335,921	$328,365	$332,351	$311,901	$298,917	$269,989	$166,446
Transfer from (to) the Water Fund	$0	$0	$0	$0	$0	$0	$0	($10,498,237)
Ending Balance	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$21,360,781**	**$13,128,528**	**$0**

Since the timeframe covered by the Financial Plan Model is somewhat long at eight years, many assumptions in the model such as actual construction costs, inflation factors, and growth rates may be different than what is modeled, especially in later years. The City has two different CIP scenarios that significantly affect the Water Mater Plan Fund balance. Because one of the scenarios involves a third party funding the Southeast Reservoir expense, the City currently has no way of knowing which scenario will occur. Additionally, both scenarios have the same level of CIP expenditure for the first five years, which the Water Master Plan Fund is able to accommodate. Therefore, it is recommended that the City update the Water Master Plan and Financial Plan in about 2016 and then revisit any rate adjustments, as the City will have a better idea of which CIP scenario will be in effect and what the remaining capital obligations are at that time.

1 CITY CHARACTERISTICS AND PROJECTED GROWTH

The City has reached near full development with only 2.2% of land remaining vacant. However, development and redevelopment projects that are either on-going or planned will affect future water demands. The City's population is projected to increase 15% by 2035 with housing projected to increase 10.7%[1].

1.1 Land Use

There are 17,234 acres of land within the City boundaries, 17,368 acres if including the recently annexed Sunset Beach area. Existing land use in the City is shown on Figure 1-1 and is tabulated in Table 1-1. The existing land use presented is from the City's current General Plan and from the City's Vacant Land Survey. Land Use presented in this water master plan is solely for the purposes of estimating water demands.

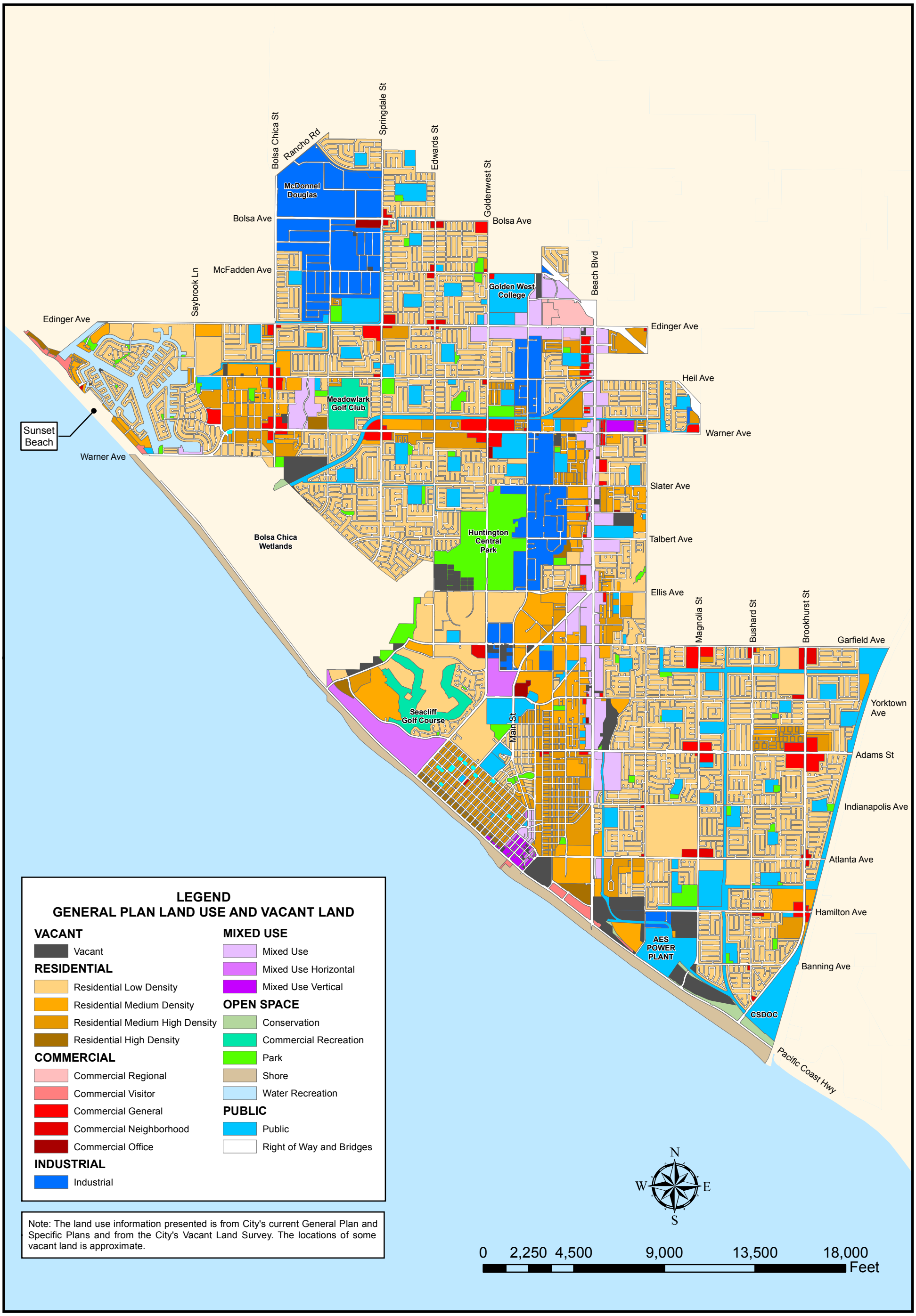
As shown in Table 1-1, only 2.2% of the City remains as vacant land (376 acres). Of this vacant land, approximately 32% is designated residential, 28% is designated open space - conservation, and 22% is designated open space - park. It is assumed that all of this land will be developed ultimately with the exception of vacant land in the open space conservation category, which is assumed to remain open space, i.e. no projected increase in future water demands.

Pursuant to the General Plan, the City is currently being developed in accordance with 14 Specific Plans. The largest Specific Plans currently underway are the Beach and Edinger Corridors Specific Plan and the Downtown Specific Plan.

The largest land use in the City is residential at 7,909 acres (approximately 46% of the total). Approximately 71% of the residential land use is low density residential (3 to 7 dwelling units (DU) per acre). Commercial land use is spread out over the City (550 acres). The Hyatt Regency Huntington Beach Resort and Conference Center and the Hilton Water Front Beach Resort constitute the majority of the 67 acres of Commercial Visitor land use.

The General Plan Land Use at Build-out is shown on Figure 1-2. Approximately 850 acres in the City are designated for Mixed Use, which is a composite of Commercial Neighborhood, Commercial General, and Residential including town homes, garden apartments, and mid to high-rise apartments. Mixed Use is also designated as either vertical or horizontal integrated housing. As shown on Figure 1-2, a large portion of the mixed use land borders Beach Boulevard from Adams Avenue to Edinger Avenue as part of the Beach and Edinger Corridors Specific Plan. Mixed use land use is also designated in the downtown area near the Main Pier. The large mixed use area with horizontal integrated housing located between the Seacliff Golf Course and PCH is already partially developed in accordance with the Palm/Goldenwest Specific Plan.

[1] Center for Demographic Research (CDR) at California State University Fullerton, 2010 Orange County Projections, 2010.



LEGEND
GENERAL PLAN LAND USE AND VACANT LAND

VACANT
- Vacant

RESIDENTIAL
- Residential Low Density
- Residential Medium Density
- Residential Medium High Density
- Residential High Density

COMMERCIAL
- Commercial Regional
- Commercial Visitor
- Commercial General
- Commercial Neighborhood
- Commercial Office

INDUSTRIAL
- Industrial

MIXED USE
- Mixed Use
- Mixed Use Horizontal
- Mixed Use Vertical

OPEN SPACE
- Conservation
- Commercial Recreation
- Park
- Shore
- Water Recreation

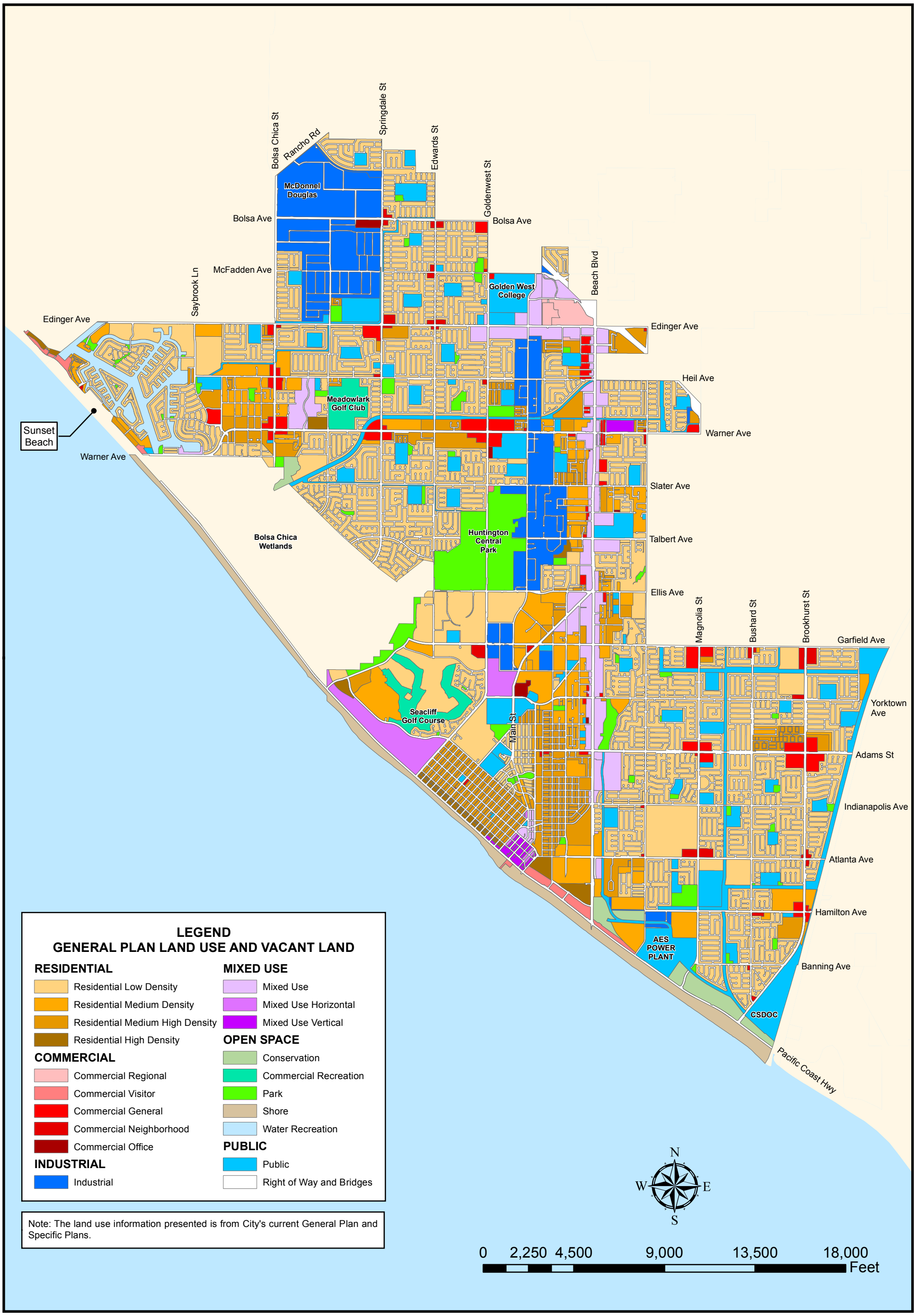
PUBLIC
- Public
- Right of Way and Bridges

Note: The land use information presented is from City's current General Plan and Specific Plans and from the City's Vacant Land Survey. The locations of some vacant land is approximate.

City of Huntington Beach
2012 Water Master Plan
Existing City Land Use
Figure 1-1

Table 1-1
Existing Land Use

General Plan Land Use Category	Total Net Area (Ac)	Vacant Area (Ac)	% Land Use	% Total Vacant Land
Residential				
Low Density (3 to 7 DU/Ac)	5,645.23	28.78	0.5%	7.6%
Medium Density (15 DU/Ac)	1,152.72	70.21	6.1%	18.7%
Medium High Density (25 DU/Ac)	1,005.22	1.55	0.2%	0.4%
High Density (30+ DU/Ac)	105.37	18.41	17.5%	4.9%
Subtotal	7,908.54	118.95	1.5%	31.6%
Mixed Use	850.01	14.39	1.7%	3.8%
Commercial				
Commercial Regional	66.00	-	-	-
Commercial Visitor	67.09	19.31	28.8%	5.1%
Commercial General	297.41	4.15	1.4%	1.1%
Commercial Neighborhood	92.27	1.65	1.8%	0.4%
Commercial Office	27.21	-	-	-
Subtotal	549.98	25.11	4.6%	6.7%
Industrial	1,153.03	16.20	1.4%	4.3%
Open Space & Other				
Open Space - Conservation	152.70	104.17	68.2%	27.7%
Open Space - Commercial Recreation	237.88	-	-	-
Open Space - Park	629.40	83.37	13.2%	22.1%
Open Space - Shore	373.36	-	-	-
Open Space - Water Recreation	243.27	-	-	-
Right of Ways and Bridges	3,511.31	0.32	0.0%	0.1%
Subtotal	5,147.92	187.86	3.6%	49.9%
Public	1,624.89	13.89	0.9%	3.7%
TOTAL	**17,234**	**376.40**	**2.2%**	**100.0%**



LEGEND
GENERAL PLAN LAND USE AND VACANT LAND

RESIDENTIAL
- Residential Low Density
- Residential Medium Density
- Residential Medium High Density
- Residential High Density

COMMERCIAL
- Commercial Regional
- Commercial Visitor
- Commercial General
- Commercial Neighborhood
- Commercial Office

INDUSTRIAL
- Industrial

MIXED USE
- Mixed Use
- Mixed Use Horizontal
- Mixed Use Vertical

OPEN SPACE
- Conservation
- Commercial Recreation
- Park
- Shore
- Water Recreation

PUBLIC
- Public
- Right of Way and Bridges

Note: The land use information presented is from City's current General Plan and Specific Plans.

City of Huntington Beach
2012 Water Master Plan
General Plan City Land Use
Figure 1-2

A total of 1,637 acres is dedicated to open space including Open Space/Parks (public parks) and Open Space/Commercial Recreation. Huntington Central Park is the largest public park in the City at 343 acres, not all of which is developed. The Seacliff Golf Course and the Meadowlark Country Club constitute the commercial recreation land use in the City at 238 acres.

There are 1,153 acres of industrial land in the City. The largest industrial area is in the northwest corner of the City where Boeing and the McDonnell Center Business Park are located. The second largest industrial area is the Gothard Industrial Corridor that borders Gothard Street between Ellis Avenue and Edinger Avenue.

Another industrial area in the City is the Southeast Industrial Area, which is actually a composite of industrial, public, and open space conservation zoned land uses. The AES Huntington Beach Generating Station (power plant) is located in this area. A 38-acre land fill is also located in the Southeast Industrial Area. The Orange County Sanitation District No. 2 Wastewater Treatment Plant is located in the far southeast corner of the City. Both the power plant and the treatment plant are large City water users.

The City also supplies water to Sunset Beach, which is approximately 134 acres of recently incorporated land located off Pacific Coast Highway near Huntington Harbour. Sunset Beach land use is not included in Table 1-1 (approximately 22 acres Residential, 9 acres Visitor Commercial, 28 acres right-of-way and 75 acres Public and Open Space, including the beach and channel).

1.2 Population and Housing

The population of the City's water service area (including Sunset Beach with an estimated population of approximately 1,300 per Municipal Water District of Orange County's agency projections) is estimated at 204,831 for 2010, and is growing slowly, as there is very little remaining vacant land. The City provides water to over 52,350 service connections. The Huntington Beach water service area is predominantly residential with over 92 percent of water service connections serving single-family and multi-family residences.

The population per household for the City of Huntington Beach was estimated at 2.59 by the Center for Demographic Research (CDR) at California State University Fullerton in 2010. This average population per household is for the City of Huntington Beach which makes up almost the entire water service area (excluding Sunset Beach).

Utilizing CDR's 2010 Orange County Projections (OCP), adjusting to include the City's approved plans for the Downtown Area Specific Plan and the Beach and Edinger Corridors Specific Plan, and including the Sunset Beach population, generates a 10.4 percent increase in population over the next 25 years in the City's water service area from 204,831 in 2010 to 226,178 in 2035. The total dwelling units in the water service area are projected to increase 10.7 percent from 78,644 in 2010 to 87,029 in 2035. For comparison, population and total dwelling units for Orange County are projected to increase 15% and 10%, respectively, between 2010 and 2035. Historical and projected water service area population and housing is shown in Table 1-2. However, it should be

noted that since the preparation of the City's 2010 UWMP, which was based on the CDR's OCP 2010 data, adjusted for the Downtown and Beach and Edinger Areas, the 2010 Census data has been released. As with most cities in the State, both Huntington Beach and Sunset Beach populations were reported substantially less than the CDR's OCP 2010 data. According to the 2010 Census data, the 2010 population for the City was 189,992 and for Sunset Beach was 971, for a total water service area population of 190,963. One primary factor behind this lower projection was vacancy rates, which were reported at 4.8% for the City and 19.7% for Sunset Beach.

The number of people per dwelling unit (DU) (population density) within the water service area was 2.43 in 2010 based on the 2010 Census population and total housing data. This figure does not adjust for vacant units (i.e. it is total population divided by total housing units). The population density using the 2010 CDR OCP data is 2.60 and is projected to increase slightly to 2.67 in 2020 and then return to 2.60 in 2035. However, if vacancy rates return to more normal rates (especially in Sunset Beach's case); population density will increase in the water service area. Population density is important in that an increase in people per dwelling unit will result in an increase in water demand, even if total housing units remain constant.

For comparison, the population density for Orange County is projected to increase approximately 4.0% in 2035 (relative to the year 2010) based on the OCP projections for population and total housing and under the same assumption of a constant vacancy percentage. Huntington Beach has a lower population density than Orange County as a whole. The Orange County population per total dwelling unit (occupied plus unoccupied) was 3.04 in 2000 and is projected to increase to 3.17 by 2035.

Table 1-2
Historical and Projected Population and Housing

	Historical			Projected				
	1990	2000	2010*	2015	2020	2025	2030	2035
Population	181,519	189,594	204,831	208,622	214,441	220,853	225,721	226,178
Annual % Increase	0.63%	0.44%	0.80%	0.37%	0.56%	0.60%	0.44%	0.04%
Total Dwelling Units	72,736	75,662	78,644	78,615	80,242	83,799	85,610	87,029
Annual % Increase	1.13%	0.40%	0.39%	-0.01%	0.41%	0.89%	0.43%	0.33%
Population/DU	2.50	2.51	2.60	2.65	2.67	2.64	2.64	2.60

Source: CDR OCP 2010 adjusted to include Downtown Area Specific Plan and Beach and Edinger Corridors Specific Plan updates. Population and dwelling units reflect total water service area including Sunset Beach.
*Note: 2010 Census data is 190,963, approximately 7.3% below 2010 projection of 204,831 by CDR OCP 2010.

2 WATER DEMAND

Water demand has decreased over the past decade even though development has occurred and the City's population has increased during this time. Unaccounted-for water, which is the difference between water supply and water consumption and represents "lost" water, has decreased since 1995/96 and this decrease is attributed in large part to a leak detection survey conducted for the City in 1996/97. Water demands are estimated to increase 7.1% by the year 2035 over 2010 demand, which represents the Ultimate System for the planning period, as a result of proposed new development and a projected 18% increase in population.

2.1 Historical Potable Water Production

Historical potable water production for 15 years 1995/96 through 2009/10 is shown in Table 2-1. The City's water year for the purposes of this report is July through June, whereas the City's fiscal year is October through September. The water year format is consistent with the Municipal Water District of Orange County (MWDOC) and Orange County Water District (OCWD) projections. All historical data presented in this water master plan is in accordance with the City's water year and what has been presented in the City's 2010 Urban Water Management Plan.

Goldenwest # 4 and Meadowlark # 2 are City wells that produce non-potable water (high color) and are used for irrigation purposes only. This non-potable water production has been subtracted from the potable water production in Table 2-1. Goldenwest # 4 was removed from service in 2011. Test pumping for Well No. 8 and for Well No. 12 in 1998/99 is also subtracted from potable water production in Table 2-1.

The effect of rainfall on water demand, primarily irrigation demand, is shown on Figure 2-1. Mean rainfall for the 15-year period shown is less than the long term average of 11.31 inches. Water production has decreased since 2004 despite dry conditions. This can be attributed in part to the water conservation measures undertaken by the City and its residents.

Table 2-1
Historical Potable Water Production (Acre-Feet)

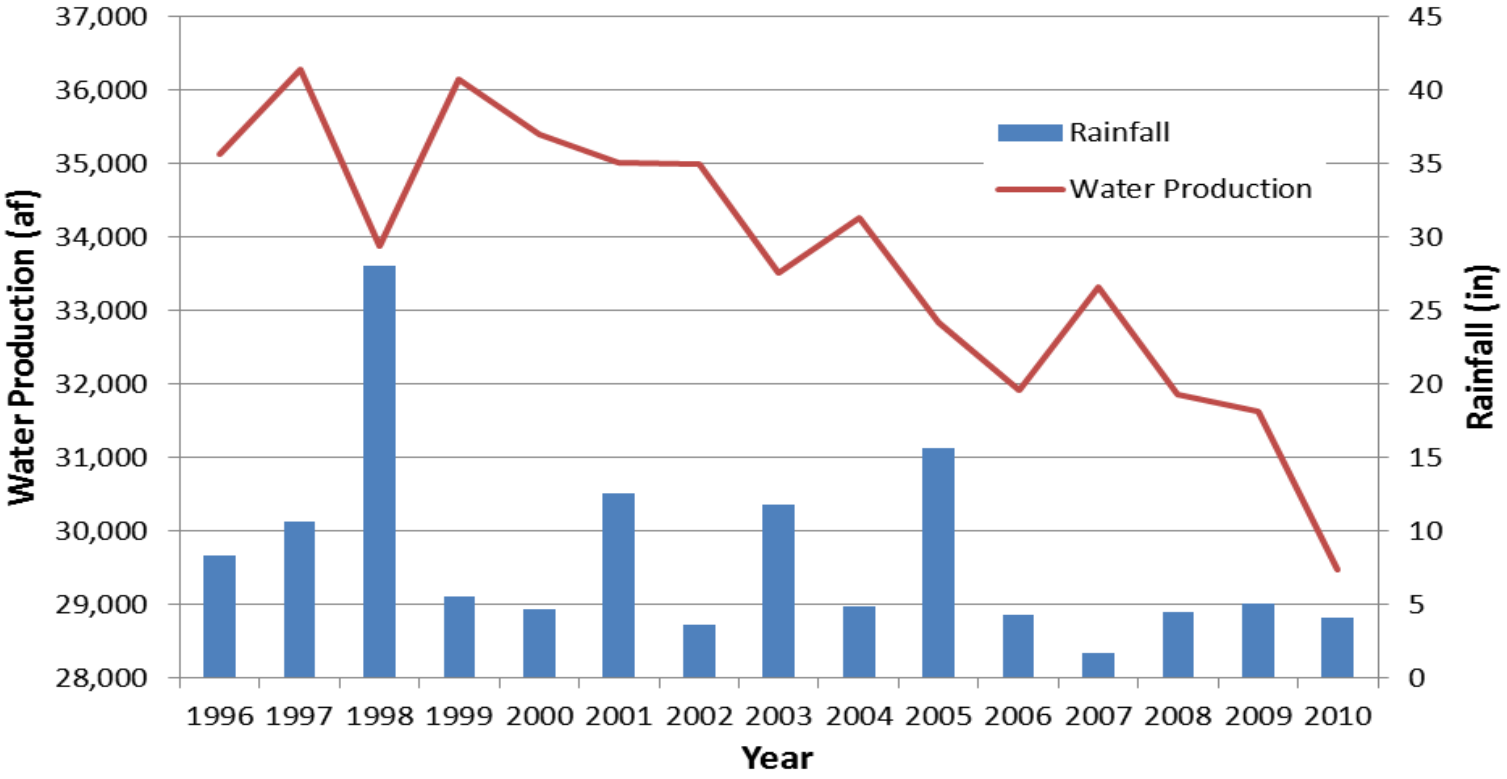
	Historical City Water Supply (1996-2010)															
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
Total Water Production	35,122	36,287	33,880	36,155	35,398	35,010	35,001	33,509	34,272	32,837	31,912	33,331	31,858	31,630	29,468	33,711
Non-Domestic Irrigation[1]	326	400	269	233	299	328	357	301	360	312	276	362	333	293	229	312
Well to Waste[2]	0			1,706												
Total Domestic Supply	34,796	35,887	33,611	34,216	35,099	34,682	34,644	33,208	33,912	32,525	31,636	32,969	31,525	31,337	29,239	33,286
Ratio to 15-Yr Average	1.05	1.08	1.01	1.03	1.05	1.04	1.04	1.00	1.02	0.98	0.95	0.99	0.95	0.94	0.88	1.00
Rainfall (in)[3]	8.29	10.62	28.08	5.57	4.65	12.57	3.66	11.77	4.89	15.60	4.28	1.68	4.49	5.08	4.11	8.36

(1) Groundwater produced by Goldenwest #3, Goldenwest #4, and Meadowlark #2 is non-potable due to high color and is used for irrigation.

(2) Test pumping of Well No. 12 and Well No. 8.

(3) Newport Beach Harbor Station #046175. Average for period of record is 11.3 in/yr (1921-2010).

Figure 2-1
Historical Potable Water Production vs. Rainfall



2.2 Historical Water Consumption/Unaccounted-For Water

Historical City water consumption and unaccounted-for water for the six years 2004/05 through 2009/10 is shown in Table 2-2. Water consumption was developed from City billing records. Unaccounted-for water, also referred to as non-revenue water is the difference between metered water production and metered water consumption and represents "lost" water. Unaccounted-for water occurs for a number of reasons:

- Water lost from system leaking, i.e. from pipes, valves, pumps, etc.
- The City Fire Department performs hydrant testing to monitor the level of fire protection available throughout the City and the City Public Works Department, Utilities Division performs hydrant flushing to eliminate settled sediment and ensure better water quality. Neither is metered. However, the quantity of water used is estimated and taken into consideration when calculating unaccounted-for water.
- Water used by the Fire Department to fight fires. This water is also not metered.
- Customer meter inaccuracies. Meters have an inherent accuracy for a specified flow range. However, flow above or below this range is usually registered at a lower rate. Meters become less accurate with time due to wear.

Based on the City's 2005 Water Master Plan, unaccounted-for water averaged 6.4% during the nine year period from 1996/97 to 2004/05. During the five year period from 2005/06 through 2009/10, unaccounted-for water has averaged 5.4 percent. Thus, over the past 14 years, unaccounted-for water has averaged 6.0 percent.

Unaccounted-for water was 9.9 percent in 1995/96 but has decreased since then largely due to a leak detection survey conducted for the City in 1996/97. A total of 498 miles of pipeline was surveyed, with a water loss of approximately 67,000 gpd quantified from 17 identified leaks. The annual water loss from these leaks was quantified as approximately 24.4 million gallons. The City repaired all of the leaks identified in the survey and has since implemented an on-going leak investigation and repair program as a measure to keep water losses to a minimum while facilitating cost savings[2]

The City will continue to use the calibrated hydraulic model of the water system, which will be updated as part of this master plan, to help estimate fire hydrant pressures. Only those fire hydrant pressures that are found to be deficient or close to deficient in the model will be verified in the field. Utilization of the model has essentially eliminated the need for fire hydrant flow tests.

[2] City of Huntington Beach, 2005 Water Master Plan, March 2006

Table 2-2
Historical Water Consumption

	Historical City Water Consumption/Production/Unaccounted-For Water (Acre-Feet)						
	2005	2006	2007	2008	2009	2010	Average
Consumption	**30,105**	**29,450**	**31,644**	**30,716**	**29,937**	**27,896**	**29,958**
Production	**32,837**	**31,912**	**33,331**	**31,858**	**31,630**	**29,468**	**31,839**
Unaccounted-For Water	2,732	2,462	1,687	1,142	1,693	1,572	1,881
Unaccounted-For Water %	8.3%	7.7%	5.1%	3.6%	5.4%	5.3%	5.9%

The California Urban Water Conservation Council recommends a complete distribution system audit if unaccounted-for water exceeds 10%. With the City currently averaging less than 6%, an audit is not needed.

Average daily per capita municipal and industrial (Per Capita M&I) water demand has been used by the water industry to measure and compare mean urban water demand. Per Capita M&I water demand includes the municipal, industrial, commercial, residential water demand, and unaccounted-for water associated with each person in the population. Historical Per Capita M&I water demand for the City is shown in Table 2-3.

Table 2-3
Historical Per Capita M&I Demand

Historical Per Capita Municipal and Industrial Water Demands							
Water Demand	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Average**
Total Demand (AF)	32,837	31,912	33,331	31,858	31,630	29,468	31,839
Population (1,000)	201.1	201.7	201.9	202.3	203.6	191.0	200.2
Total Per Capita (gpcd)	145.8	141.3	147.4	140.6	138.7	137.8	141.9
Rainfall (in)	15.6	4.3	1.7	4.5	5.1	4.1	5.9

Although Per Capita M&I water demand is still a useful measure for evaluating urban water demand, the various demand components evaluated separately can offer a more complete perspective. Historical City water demands by billing classifications are shown in Table 2-4.

Table 2-4
Historical Water Demand by Billing Class

Historical City Water Demands Per Billing Classifications (Acre-Feet)							
Demands Per City Billing Class	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Average**
Single Family Residential	14,787	14,769	15,715	15,144	14,830	13,937	14,864
Multi-Family Residential	6,967	6,721	6,869	6,704	6,579	6,298	6,689
Population (1,000)	*201.1*	*201.7*	*201.9*	*202.3*	*203.6*	*191.0*	*200.2*
Residential Per Capita (gpcd)	*96.6*	*95.1*	*99.9*	*96.4*	*93.9*	*94.6*	*96.1*
Commercial	4,142	4,013	4,415	4,206	4,086	3,700	4,094
Industrial	661	684	666	606	564	514	616
Institutional/Municipal	599	88	258	300	229	169	274
Irrigation	2,332	2,597	3,132	3,121	3,057	2,759	2,833
Other	616	580	589	634	592	519	588
Total Demand (AF)	**30,105**	**29,450**	**31,644**	**30,716**	**29,937**	**27,896**	**29,958**

The demand data is from City billing data and does not include unaccounted-for water. Residential per capita demand for the most recent six years 2004/05 through 2009/10 averaged 96.1 gpcd, which is 8% less than in 2003/04 (105 gpcd) and 14% less than in 1999/00 (112 gpcd). The downward trend in strictly residential water use can be attributed in part to water conservation programs undertaken by the City including public information programs, school education programs, water survey programs, and plumbing fixture retrofits.

It should be noted that the per capita residential use and total per capita use discussed above is not the same as the per capita calculation that must be reported as a part of the 20 x 2020 water conservation targets required by the State Department of Water Resources in Urban Water Management Plans starting with the 2010 Plan. The formula for developing the baseline per capita, 2020 target, and interim 2015 target to measure an agency's success in meeting the 20% mandated conservation by 2020 is somewhat different. It includes total water use (exclusive of agricultural use) divided by total service area population but allows for credits for recycled water use. The City does not have any direct recycled water use but does get a pro-rata credit for indirect recycled water based on OCWD's Groundwater Replenishment System.

Commercial and industrial water demand decreased from 4,803 AF in 2004/05 to 4,214 AF in 2009/10 (12% decrease). Decreased water use for the Commercial and Industrial billing categories can be attributed in part to the City's participation in MWDOC's and MWD's regional commercial, industrial, and institutional water-use efficiency programs, as well as the Metropolitan and MWDOC water allocation program put in effect in 2009/10 and lifted just prior to the end of 2010/11. Another reason for this decrease is the

gradual implementation by the City of dual meters in place of single meters for metering commercial and industrial accounts as well as multi-family residential accounts. The purpose of this program is to separate irrigation use from potable water use as many of these meters currently measure both potable and irrigation water use.

As new businesses come into the City or renovation of existing businesses occur, a separate irrigation meter is being installed by the owner when the landscape area exceeds 2,500 square feet. However, there is still a substantial amount of irrigation water use that is reported under the Commercial, Industrial and Multi-family billing categories. Implementation of this dual meter program has been occurring gradually over the past decade, plus. Under this program, one meter is dedicated to measuring internal water use under the Commercial or Industrial billing category, while a separate meter would be installed to measure irrigation water use under the Irrigation billing category. Over the five-year period from 2004/05 to 2009/10, total irrigation meters have increased from 873 to 934 with the majority of those new meters being conversions from single to dual meters on an existing site. Even with this 7% increase in irrigation meters, irrigation use only increased from 2,605 AF in 2004/05 to 2,651 AF in 2009/10 (less than 2% increase), primarily due to water conservation.

Also, Irrigation water use is greatly affected by rainfall amounts. However, due to the reasons indicated above, it is difficult to correlate Irrigation billing amounts to rainfall patterns. If the number of irrigation meters and acres being irrigated remained constant, a pattern could be more easily developed. Average rainfall at the Newport Beach Harbor Station has averaged 8.4 inches per year over that past 15 years (1996-2010), which is lower than the historical average of approximately 11.3 inches per year over the recorded period since 1922. Rainfall in 1997/98 was 28.1 inches, the highest on record. It does appear that the response of increased water use in years of low rainfall is much less severe than in past years. This is evidenced by the fact that the City's highest water demand over the six year period of 2004/05 and 2009/10 was in 2006/07 at only 5% higher than the average of that six year period, when rainfall during that 2006/07 was only 15% of average (1.7 inches). The City participates in MWDOC's regional landscape irrigation efficiency programs and institutes irrigation efficiency parameters in the City Municipal Code.

2.3 Projected Water Demands

City water billing and production data, population data from CDR, land use areas from the City's General Plan, and vacant land from the City's Vacant Land Survey were used to develop Existing System (year 2010) and Ultimate System (year 2035) unit water use factors and demands. The City provided meter data (1998/99 through 2009/10) for six billing categories. The six billing categories, which constitute the total water consumption for the City, are similar to the land use categories used in the City's General Plan.

City domestic water production averaged 32,367 AFY (28.9 MGD or 20,069 gpm) over the 3-year period 2005/06 through 2007/08 and this could be taken to be the average or normal year "existing" system water demand. This period is used because it is relatively current but prior to the nearly two-year Metropolitan/MWDOC mandated water

conservation initiated in 2008/09 due to the prolonged drought of that time. This value was the average water use reported for a normal year in the City's 2010 UWMP.

For projecting future average water use in the 2010 UWMP, development and population projections were used from two sources; the draft 2010 Orange County Projections (OCP) assembled by the Center for Demographic Research at California State University Fullerton as obtained from the City's Planning Department staff. These data were updated to include some additional development statistics not included in the OCP developed by City Planning staff. This information is summarized in a Technical Memorandum dated May 11, 2011 and included in Appendix A and the projections in 5-year increments to Year 2035 are shown in Table 2-5.

As shown in Table 2-5, the 2035 water demand is projected to be 34,657 AFY or approximately 30.9 MGD, 7.1% higher than the assumed 2010 normal year demand of 32,367 AFY. This increased water demand equates to an annual water demand growth of approximately 0.27% per year, compounded.

Table 2-5
Projected Water Demands

Projected Water Demands						
Water Demand	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Total Demand (AFY)[1]	29,468	32,616	33,036	33,823	34,324	34,657
Total Demand (MGD)[1]	26.3	29.1	29.5	30.2	30.6	30.9
Population (1,000)	191.0	208.6	214.4	220.9	225.7	226.2
Total Per Capita (gpcd)	137.8	139.6	137.6	136.7	135.8	136.8

(1) 2010 volume reported above is actual use. 32,367 AFY was used as 2010 normal year demand for purposes of projecting future water demands as explained above.

The projected water demands discussed above are average annual demands typically displayed in AFY or average day demand (ADD) typically displayed in million gallons per day (MGD) or gallons per minute (gpm). Another important projection is maximum day demand (MDD) or the highest 24-hour demand over the course of a year as a water system must be capable of supplying MDD. The peak daily or diurnal fluctuation or the peak hour demand (PHD) is typically handled from operational storage in reservoirs so is not important in determining supply requirements.

Based on extensive analysis, the 2005 Water Master Plan settled on a 1.8 MDD factor (MDD = 1.8 times the ADD) for the entire water system, which included a 15% factor of safety over measured data. A 2.7 MDD factor was selected for Zone 2, which is typical as a smaller area with less land use diversity experiences higher peaking factors. Monthly water use for the five year period ending in FY 2010 resulted in an average maximum monthly demand factor of 1.45, occurring in the month of August. Diurnal curves for a typical week in June of 2007 provided by City staff resulted in the maximum day of that week being 1.06 times the average day of the week. In order to achieve a 1.80 MDD

factor, the maximum week would have to be 1.17 times higher than the maximum month (1.45 x 1.17 x 1.06 = 1.80), which is perfectly logical. Therefore, the factors utilized in the previous hydraulic model analyses are deemed to be appropriate for use in the modeling analyses conducted in this master plan.

The 32,367 AFY (28.9 MGD or 20,069 gpm) of ADD used as the 2010 normal year demand equates to a MDD of 52.0 MGD or 36,124 gpm. For 2035, the projected 34,657 AFY (30.9 MGD or 21,489 gpm) of ADD equates to a MDD of 55.6 MGD or 38,680 gpm.

3 WATER SUPPLY AND RELIABILITY

The City's existing sources of potable water supply consist of ten groundwater wells, three imported water connections, and three emergency connections with neighboring cities.

Orange County Water District (OCWD) manages the Orange County Groundwater Basin (Basin), which the City overlies. OCWD sets a Basin Production Percentage annually, which allows the City and other Basin producers to pump groundwater up to the BPP percentage of their total water supplies to meet demands. The BPP is set at 65% (FY 2011/12).

The City also purchases treated, imported water from the Municipal Water District of Orange County (MWDOC), which is a member agency of the Metropolitan Water District of Southern California (MWD). The City has historically used more groundwater than imported water to meet demands as groundwater production is less expensive, at least in quantities up to the BPP.

The City's water supply consistently meets or exceeds all State and federal potable water quality standards. The City maintains a water quality monitoring program consistent with State requirements.

3.1 City Water Supplies

As a member agency of OCWD, the City is entitled to produce groundwater from the Basin. The Basin, which is managed by OCWD, is unadjudicated. The City and other Basin producers pay a Replenishment Assessment (RA) to OCWD for all groundwater produced up to a percentage of the producer's total water supplies used to meet demands. This percentage is called the Basin Production Percentage (BPP), which is set uniformly for all producers annually by OCWD based on Basin conditions and long-term projections.

For FY 2011/12, OCWD increased the BPP from 62% to 65% where it was for the previous few years due to drought conditions and low Basin levels. The RA is currently set at $254/acre-foot.

In addition to the RA, OCWD charges a Basin Equity Assessment (BEA) for pumping in excess of the BPP, which is basically a penalty to help maintain the Basin at projected levels. The BEA, which is set at $512/acre-foot for FY 2011/12, essentially equates the cost of groundwater pumped over and above the BPP to the rate charged for imported water from MWDOC. BEA rate will vary slightly between different member agencies of OCWD, as the rate is adjusted based on each member agency's groundwater pumping costs.

The City's (FY 2011/12) cost for producing groundwater up to the BPP is $290/acre-foot (including the RA and energy but not including other well operation and maintenance costs). The City supplements groundwater with treated, imported water from MWDOC at the (FY 2011/12) rate of $798.25/acre-foot exclusive of connection charges, readiness to

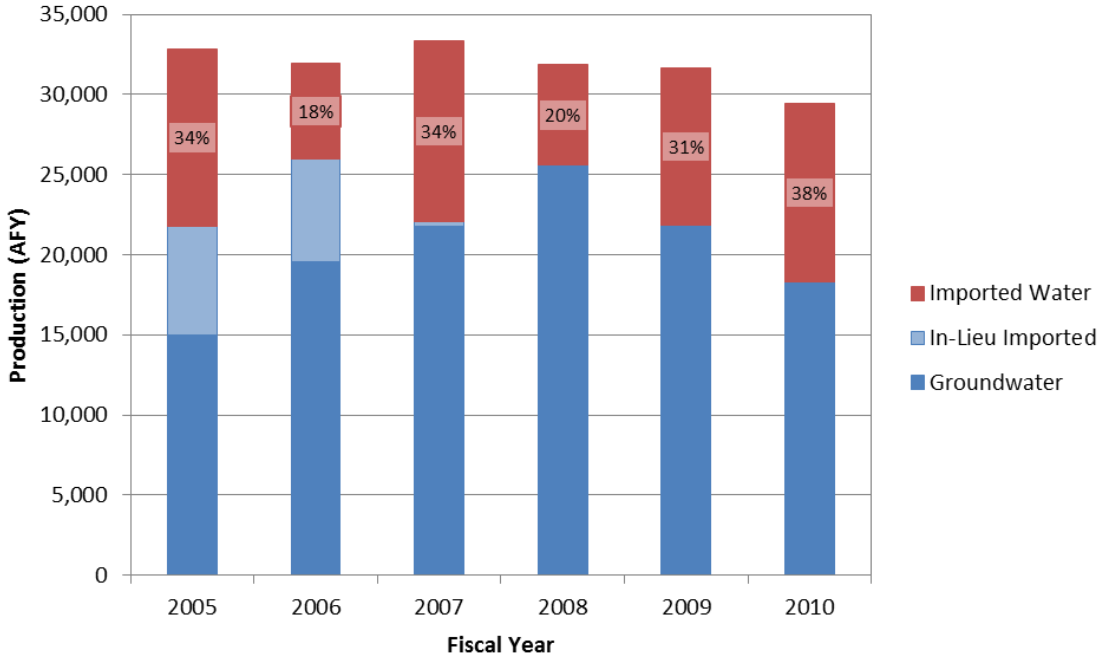
serve charges, and other fixed fees. These other MWDOC fixed charges applicable to the City for FY 2011/12 are the retail service connection charge of $327,325/year, a readiness to serve charge of $37,124/month, and a capacity charge of $12,125/month. The City also pays MWDOC for "Choice Programs" such as Water Use Efficiency $32,479/year, School Program $20,300/year, and Huntington Beach Desal Workgroup $2,204/year.

The City's water supply has averaged 64% groundwater pumped and 36% imported water purchases over the recent six year period (2004/05 – 2009/10) as shown in Table 3-1 and shown graphically on Figure 3-1. It should be noted, however, that the City participates in the In-Lieu or Cyclic Storage Program offered by OCWD and MWD, when available. This is a groundwater program that refills the Basin by avoiding pumping from the Basin, and is usually offered in the wetter years and in the lower demand period of October through April. In the program, OCWD requests the City to leave a number of its wells turned off and the City then takes replacement, or in-lieu, water through its imported water connections, which water is purchased by OCWD from MWD through MWDOC. OCWD purchases the in-lieu water at a reduced rate, and then bills the City the amount it would have had to pay for pumping energy and the RA as if it had produced the water from its wells.

Table 3-1
Groundwater Production vs. Imported Water Purchases
(FY05 – FY10)

	Fiscal Year						
Water Supply	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Average**
Groundwater (AFY)	14,945	19,543	21,795	25,573	21,857	18,271	20,331
Imported Water (AFY)	17,892	12,369	11,536	6,285	9,773	11,197	11,509
Total (AFY)	**32,837**	**31,912**	**33,331**	**31,858**	**31,630**	**29,468**	**31,839**
% Imported	54%	39%	35%	20%	31%	38%	36%
In-Lieu Imported (AFY)	6,850	6,466	263	0	0	0	2,263
Adjusted % Imported	34%	18%	34%	20%	31%	38%	29%

Figure 3-1
Groundwater Production vs. Imported Water Purchases
(FY05 – FY10)



In-lieu imported water purchases have been approximately 7% of the total city water supply over this six year period, with imported water purchases not applicable to this program at approximately 29% for total imported water purchases of 36% as shown on Table 3-1. Also, as shown in that table and the corresponding figure, in-lieu water was not available in four of the six years shown (except for a small amount one year) due to drought conditions in southern California and averaged only 2,263 AFY over that period. However, it was available in six of the eight years previous to this recent period dating back to 1996/97 and averaged 4,647 AFY during that previous eight-year period. Due to the wet winter of 2010/11, the in-lieu program has been re-instated by MWD and substantial quantities have been taken by the City in recent months. In-lieu water is regarded as groundwater production when calculating a producer's BPP. Therefore, the City's groundwater production for BPP purposes has averaged 71% during this period, adjusted to include in-lieu water. This is calculated taking 100% minus the Average Adjusted % Imported of 29% shown in Table 3-2.

3.2 Water Quality

The Safe Drinking Water Act (SDWA), which was enacted in 1974, is the main federal law that regulates potable drinking water standards. Under SDWA, the U.S. Environmental Protection Agency (EPA) sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards.

State potable water quality standards are set by the California Department of Public Health (CDPH). The potable water quality standards listed in the title 22 California Code of Regulations include primary and secondary maximum contaminant levels (MCLs). Primary MCLs are established for a number of organic and inorganic chemicals, trihalomethanes, and radioactivity as they relate to public health. Secondary MCLs are established for chemicals or characteristics as they relate to taste, odor, or appearance of drinking water. These State MCLs are the same or in some cases more stringent than the federal MCLs.

The City's water supply consisting of groundwater and imported surface water consistently meets or exceeds all State and federal potable water quality standards. The City maintains a water quality monitoring program consistent with CDPH requirements.

As a result of the high quality of the City's source water supplies, the only water treatment conducted by the City is disinfection and fluoridation. The City disinfects at each of its well sites through the injection of gaseous chlorine (CL_2) typically at a rate of about 1.0 milligrams per liter (mg/l) residual. The City receives imported surface water that has been disinfected by MWD by means of chloramination typically at a rate of about 2.2 mg/l residual.

The City has fluoridated its water supply to aid in the development of healthy teeth since 1972. The natural fluoride concentration in the local groundwater ranges from 0.3 to 0.5 mg/l. The City increases the fluoride concentration to between 0.7 and 1.3 mg/l via injection stations located at all wells. The City previously injected fluoride at the imported water connections until late 2007, when MWD began fluoridation of their water. The average fluoride level of the imported surface water at City turnouts is 0.8 mg/l.

MWD conducts extensive monitoring of its treated water at the various treatment plants within its system. OCWD also conducts more extensive testing than required by all regulatory agencies on groundwater samples taken at all of the production and numerous monitoring wells throughout the Basin on behalf of its member agencies in order to stay on top of any potential contaminant that might be detected as well as to track migration of TDS and other water quality trends. Following is a summary of recent regulations relating to potential constituents of concern and their levels in the City's water supplies.

Arsenic

In January 2006, a new federal water quality regulation reduced the MCL for arsenic, an inorganic chemical, from 50 parts per billion (ppb) to 10 ppb. California's revised arsenic MCL of 10 ppb became effective in November 2008. The average arsenic level in the City's water supply has historically ranged between "Not Detected" to 3 ppb and has averaged "Not Detected". Accordingly, treatment of City supply sources to meet the stricter arsenic MCL is not required or anticipated.

Groundwater Rule

EPA initiated the Ground Water Rule (GWR) in November 2006, which specifies the appropriate use of disinfection in groundwater and addresses other components of groundwater systems to protect against bacteria and viruses in portable groundwater supplies. The requirements of the GWR include State-conducted system sanitary surveys and compliance monitoring for systems that disinfect to ensure that they reliably achieve 99.99% (4-log) inactivation or removal of viruses. The City currently disinfects at all of their well sites through the injection of gaseous chlorine.

Radon

Radon is a naturally occurring radioactive gas that may be found in indoor air and in drinking water. Exposure to radon can increase the risk of contracting cancer. Radon in soil under homes presents a greater risk than radon in drinking water. There is currently no MCL for radon in drinking water. EPA has developed a proposed regulation to reduce radon in drinking water that includes a "Multimedia Mitigation" program option to reduce radon in air.

The proposed regulation offers two options:

- *Option 1*: States can choose to develop enhanced state-wide programs to address the health risks from radon in indoor air known as Multimedia Mitigation (MMM) programs while reducing radon levels in drinking water for individual water systems to 4,000 pCi/L (picoCuries per liter, a standard unit of radiation) or lower. EPA is encouraging states to adopt this option because it is the most cost-effective method and achieves the greatest radon risk reduction.
- *Option 2*: If a state opts not to develop an MMM program, individual water systems in that state would be required to either reduce radon in their system's drinking water to 300 pCi/L or develop individual local MMM programs and reduce levels in drinking water to 4,000 pCi/L. Water systems already at or below the 300 pCi/L standard would not be required to treat their water for radon.

Radon was monitored in the City's water supply between 2001 and 2006 and levels averaged 443 pCi/L (366 pCi/L in 2001, 443 pCi/L in 2002, 356 pCi/L in 2003, 314 pCi/L in 2004, 596 pCi/L in 2005, and 582 pCi/L in 2006). Radon treatment alternatives include aeration and treatment with granular activated carbon filters.

Stage 2 Disinfection Byproduct Rule

Chlorine and other chemical disinfectants used by public water systems to control microbial pathogens in drinking water interact with organic and inorganic materials in source water to form disinfection byproducts (DBP). Epidemiology and toxicology studies have shown a link between disinfection byproducts, specifically total trihalomethanes (THM) and haloacetic acids (HAA), and some forms of cancer.

Effective in 2002, EPA's Stage 1 Disinfectant Byproduct Rule (DBR) requires water systems to meet THM and HAA MCLs of 80 ppb and 60 ppb, respectively. Compliance is determined by calculating the running annual averages of samples from all monitoring locations across the system. TTHM and HAA5 averaged 18 and 6; 23 and 8; and 31 and 18; for the Huntington Beach water system in 2009, 2010, and 2011, respectively. These values are well below the MCLs.

In 2006 EPA finalized Stage 2 of the regulation, which further controls allowable levels of DBPs in drinking water without compromising disinfection itself. Under the Stage 2 DBR, systems were required to conduct an evaluation of their distribution system to identify the locations with high THM and HAA concentrations. The City completed the evaluation in 2008, and submitted a Stage 2 monitoring plan for CDPH review. Full Stage 2 compliance monitoring will start in April 2012. The Stage 2 plan changed several of the locations previously monitored in the Stage 1 plan, and includes a few new sites. Under the Stage 2 DBR, compliance with the MCLs for THM and HAA are calculated for each monitoring location in the distribution system (locational running annual average), as opposed to the previous less stringent method of calculating running annual averages of samples from all monitoring locations across the system.

The Stage 2 DBR is being implemented in two phases. During Phase 1 of the implementation, the MCLs for THM and HAA are 80 ppb and 60 ppb, respectively, based on running system-wide annual averages at the current Phase 1 monitoring sites. The last Phase 1 monitoring is the First Quarter of 2012. During Phase 2, the compliance sites will be changed based on the system-wide evaluation for high DBP sites and the locational annual MCL averages will be 80 ppb for THM and 60 ppb for HAA. The Phase 2 monitoring begins the Second Quarter of 2012.

Hexavalent Chromium

In July 2011, the Office of Environmental Health Hazard Assessment (OEHHA) proposed a revised Public Health Goal (PHG) for hexavalent chromium at 0.02 ppb. The CDPH is required by California law to set a primary drinking water standard, MCL level, for hexavalent chromium and to set the MCL as close to the PHG as possible, taking into account technical feasibility (e.g., detectability and treatment) and costs. CDPH has been gather ing data associated with hexavalent chromium occurrence, treatment, and costs Now that the PHG is final, CDPH will move forward with the process of adopting an MCL for hexavalent chromium.

In the early 2000s, the California Unregulated Chemical Monitoring Rule required water utilities to monitor hexavalent chromium. However, all the data collected were at a detection limit of 1 ppb. How to develop a MCL that is as close to the 0.02 ppb PHG as technically and economically feasible with the 1-ppb detection limit database is the question. In theory, with the available occurrence data and the detection limit for reporting purposes set at 1 ppb, the proposed MCL cannot be lower than 1 ppb. If treatment costs prove prohibitive, the MCL can be even higher. If CDPH decides to collect new hexavalent chromium data from drinking water sources within the State then the MCL process will be further delayed.

The City's wells have been monitored since 2001 for hexavalent chromium and all readings have been below the 1-ppb detection limit ("Not Detected").

3.3 Groundwater Supply

The City and other OCWD member agencies are charged the RA for groundwater produced from the Basin up to the BPP, and are charged an additional BEA for groundwater produced over this percentage. The BPP is uniform for all members and is set at 65% for 2011/12 up from 62% in 2010/11. The RA is set at $254/AF and the BEA for the City of Huntington Beach is set at $512/AF for 2011/12. Over the past few years, the BPP was lowered to its historic low of 62% in consideration of lower groundwater levels. However, this year it was increased to 65% and OCWD staff is currently considering raising it to 68% for 2012/13 due to favorable groundwater levels and is anticipating it could go even higher in the near future with the Groundwater Replenishment System (GWRS) expansion coming on line in three years. During the preparation of the 2010 UWMPs in their service area, OCWD staff was indicating that a conservative long-range projection for the BPP could be 62% and are currently indicating a 65% BPP may be a more realistic conservative long-range projection, making the supply projections in the City's 2010 UWMP even more reliable.

3.3.1 OCWD Projects

OCWD has on-going and proposed projects to protect, clean, and refill/maintain the groundwater basin.

Talbert Seawater Intrusion Barrier

Since 1975, OCWD has operated a seawater barrier to keep seawater from migrating inland and mixing with and contaminating potable groundwater. OCWD's Fountain Valley Seawater Intrusion Barrier is a series of 28 injection wells running along Ellis Avenue from Euclid Street to Newland Street. A mixture of wastewater purified at Water Factory 21 in Fountain Valley and deep well water is pumped to the wells and injected into the ground to create an underground dam that blocks seawater from entering the groundwater basin.

In 2007, OCWD completed a project to further protect the groundwater supply with an expansion of the seawater intrusion barrier by constructing a pipeline southerly from Ellis Street in the Southern California Edison property near Newland Street (Harper Park) and two additional injection wells.

Groundwater Replenishment System

The Groundwater Replenishment System (GWRS), a joint project of OCWD and the Orange County Sanitation District (OCSD), takes highly treated wastewater that would have previously been discharged into the Pacific Ocean and purifies it using a three-step process consisting of microfiltration, reverse osmosis, and ultraviolet light with hydrogen peroxide. Some of this highly treated water is used to fortify the seawater intrusion barrier and some is pumped to upstream areas of the Basin where it is recharged at strategic sites into the deep aquifers of the Basin, where it eventually becomes part of the

potable groundwater supply. The treated water exceeds all federal and state drinking water standards and is near-distilled water that improves the overall quality of the groundwater basin by lowering the mineral content. This state-of-the-art water purification project, the largest of its kind in the world, has a current capacity of 70 million gallons per day (mgd) resulting in about 72,000 AFY for recharge to the Basin.

Groundbreaking on an expansion of the GWRS took place in January 2012. When operational in about 2015, this expansion will increase the capacity by 30 mgd to 100 mgd and the GWRS will then be able to provide another 31,000 AFY and a total of 103,000 AFY for supplemental recharge of the Basin.

3.3.2 City Groundwater Production

The capacity of the City's active potable wells is shown in Table 3-2 and the locations of these potable wells are shown on Figure 3-2. As shown on Table 3-2, the City has a total potable water well capacity estimated at 25,050 gpm. However, many of the City's wells are not normally operated at 100% capacity in consideration of several factors including groundwater level, water quality, availability of in-lieu water, etc. The City prolongs the life of the wells and associated supply equipment when operating at less than capacity and the normal operating capacities for the City's wells which totals about 72% of total capacity will be discussed later in this Chapter.

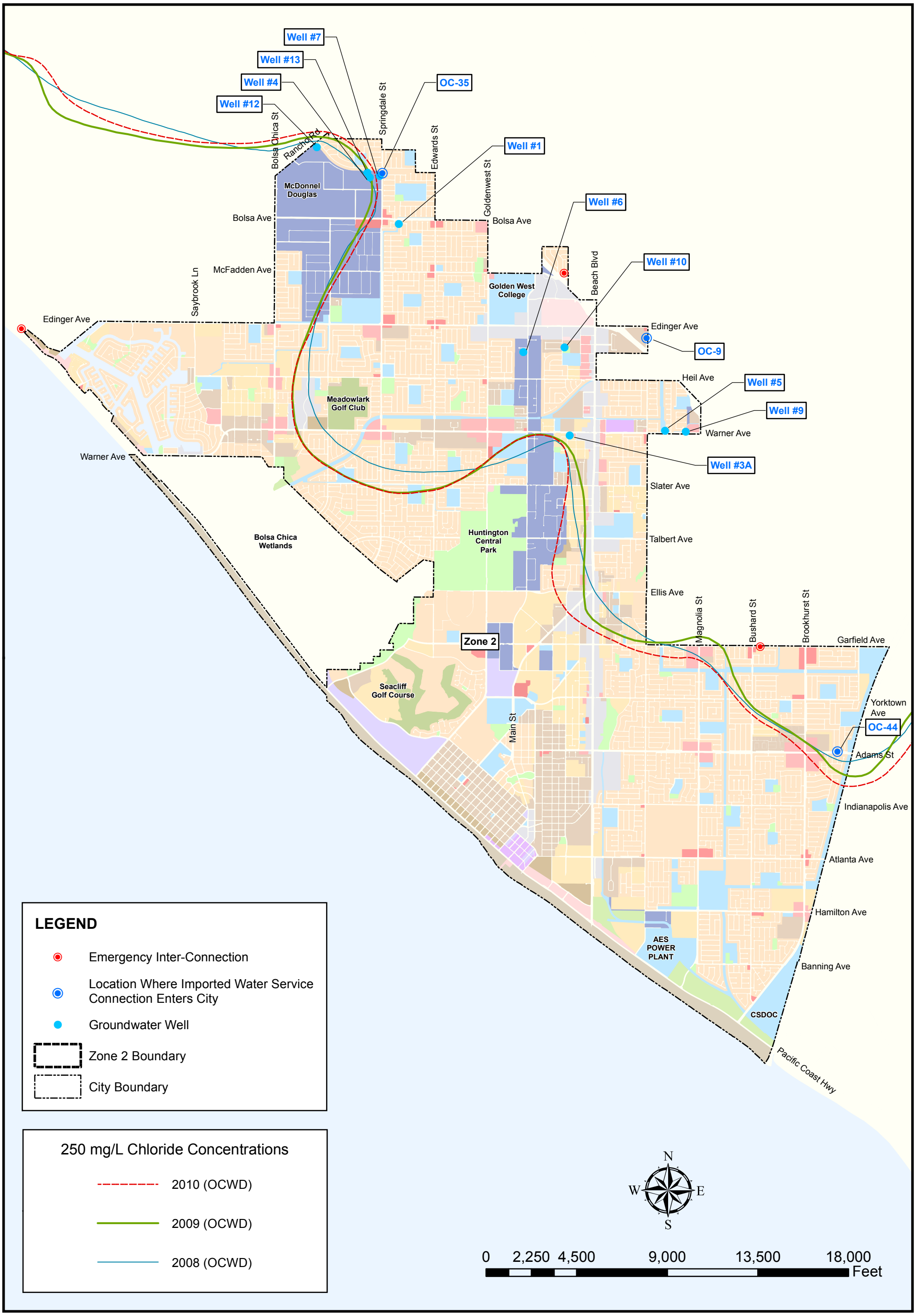
Table 3-2
Groundwater Well Production Capacities

	Year Drilled	Well Depth (feet)	Capacity (gpm)
Well No. 1	1962	306	750
Well No. 3A	1994	716	2,500
Well No. 4	1967	804	500
Well No. 5	1969	820	3,000
Well No. 6	1973	810	3,000
Well No. 7	1975	891	3,400
Well No. 9	1981	996	3,000
Well No. 10	1981	960	3,400
Well No. 12[a]	2006	800	3,000
Well No. 13	2001	800	2,500
Total Groundwater			**25,050**

Source: City of Huntington Beach 2010 UWMP.

(a) Well 12 taken out of service due to water quality issues (high chloride). May be reinstated with production reduced to 500-750 gpm; schedule to be determined.

Additionally, the City does not operate each well continuously over the course of a year (i.e. 24/7, 365 days a year). Each well is operated only about 6 to 7 months of total time to preserve the well and because during winter months demands are not high enough to pump all wells 100% of the time.



City of Huntington Beach
2012 Water Master Plan

Locations of City Potable Groundwater Wells & Imported Water Sources

Figure 3-2

The City's 2010 UWMP assumed a 62% BPP as that was what was in effect in 2010 and was what OCWD staff was indicating was a conservative assumption for future long-range planning purposes. With the current basin conditions, the continuing move toward water conservation, and the expanded GWRS projections, OCWD staff has indicated that they are looking to increase the BPP to 68% for 2012/13 and feels that agencies could easily use 65% as a conservative BPP projection for long-term planning. Based on 2010 water consumption adjusted for the drought conditions to a normal year consistent with the 2010 UWMP, and 2035 projected demands the amount of water using these two BPP percentages that could be withdrawn from the Basin without paying the BEA are as shown on Table 3-3.

Table 3-3
Groundwater Production to BPP

Supply (AFY)	2010	2035
Total Supply Requirement	32,367	34,657
GW Production to 62% BPP	20,068	21,487
GW Production to 65% BPP	N/A	22,527

3.3.3 Regional Imported Water Supply

The City purchases supplemental treated imported water from MWDOC, which is a member agency of MWD. MWD imports raw water from northern California and the Colorado River, and then treats the majority of this water to potable standards at filtration plants located throughout southern California. MWD water from northern California as part of the State Water Project (SWP) is stored at Castaic Lake on the western side of the MWD service area and at Silverwood Lake near San Bernardino. MWD water imported from the Colorado River is stored at Lake Mathews in Riverside County. The Diamond Valley Reservoir in Riverside County near Hemet provides regional seasonal and emergency storage of SWP and Colorado River water.

3.3.4 Conjunctive Use Storage Program

In 2003, MWD, MWDOC, and OCWD signed a 25-year agreement to store nearly twenty billion gallons of water in the Orange County Groundwater Basin for use during dry years and emergencies. The agreement also provides for additional protection from seawater intrusion and improved groundwater quality. Under the program, MWD, in cooperation with MWDOC and OCWD, will store more than 60,000 AF of imported water in the Basin during wet periods. During dry periods, droughts, or emergencies, up to 20,000 AFY will be withdrawn for use. The cost of the water supply will be equal to the full-service MWD imported water rate.

Eight groundwater extraction wells were provided to city and local water district participants to ensure that the stored water can be pumped in addition to the normal pumped groundwater. The operating agencies are able to use MWD's new wells as backups for their existing systems and ownership of these wells will transfer to the participating agencies when the agreement expires. Participating agencies include the cities of Buena Park, Fullerton, Garden Grove, Orange, Santa Ana, and Westminster, plus Golden State Water Company, and Yorba Linda Water District.

3.3.5 City Imported Water Supply

The City receives treated imported potable water from two primary MWD sources. MWD's Jensen Filtration Plant, located in San Fernando Valley, receives only SWP water with no water received from the Colorado River. Jensen-treated water is delivered to the City via service connections OC-9 and OC-35.

The City also receives treated imported potable water from the Diemer Filtration Plant, located just north of Yorba Linda. Typically, the Diemer Plant receives a blend of Colorado River water from Lake Mathews through the MWD lower feeder and SWP water through the Yorba Linda Feeder. At this time the blend is approximately a 50/50 blend of the two sources. Diemer-treated water is delivered to the City via service connection OC-44.

As mentioned above, imported water is delivered to the City via three service connections: OC-9, OC-35, and OC-44. The locations of these service connections or turnouts are shown on Figure 3-2. All three turnouts currently supply water directly to Zone 1. The City's allocated maximum capacities from these connections are shown in Table 3-4. OC-9 and OC-35 are both under the jurisdiction of the West Orange County Board (WOCWB), which normally require 24-hour advance notice to change delivery flows. Both service connections are located at the intersection of Dale and Katella Streets in the City of Stanton. Water from OC-9 enters the City system at the intersection of Newland Street and Edinger Avenue and water from OC-35 enters the City system at the intersection of Springdale and Glenwood Streets. Since the City is the majority owner of the WOCWB, the Public Works Department, Utilities Division is responsible for performing all operation and maintenance on the transmissions mains, and the City Utilities Manager acts as the General Manager for WOCWB.

OC-44 is located on MWD's East County Feeder No. 2. MWD, who owns the primary meter, allows the City to take water from OC-44 on a demand basis, and does not require advance notice in order to change flow settings. Water is supplied to the City from OC-44 via a 24- to 42-inch transmission line owned jointly by the City and Mesa Consolidated Water District. A secondary joint metering station to measure flows to the City is located on Adams Avenue at the Santa Ana River, where the water enters the City system.

Table 3-4
Imported Water Connections

Connection	Allocated Capacity (gpm)	Zone Supplied	Turnout Location (Location Entering City System)
OC-9	6,300	Zone 1	Dale & Katella Streets - Stanton (Newland St. & Edinger Ave.)
OC-35	9,000	Zone 1	Dale & Katella Streets - Stanton (Springdale & Glenwood Streets)
OC-44	6,700	Zone 1	East Orange County Feeder No. 2 (Adams Ave. & Santa Ana River)
Total	22,000		

3.3.6 Seawater Desalination

A third party private desalination company has been in the process of developing the Huntington Beach Seawater Desalination Project to be located adjacent to the AES Power Plant in the City along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 million gallons per day (56,000 AFY) of drinking water and will distribute water to coastal and south Orange County to provide approximately 8% of Orange County's water supply needs. The project supplies would be distributed to participating agencies through a combination of (1) direct deliveries through facilities including the East Orange County Feeder No. 2, the City of Huntington Beach's distribution system, and the WOCWB Feeder No. 2, and (2) water supply exchanges with agencies with no direct connection to facilities associated with the Project.

Many agencies in Orange County, including the City of Huntington Beach, have signed a MOU with this third party private desalination company to purchase varying amounts of capacity in this project. However, until this project becomes a reality, the City is not counting on these supplies in its water planning. In following sections, contingent plans for capital improvements with or without this project will be discussed.

3.3.7 Emergency Connections

The City has emergency mutual-aid interconnections with adjacent water agencies including the City of Fountain Valley, City of Westminster, and Golden State Water Company (City of Seal Beach). The locations of these emergency interconnections are shown on both Figures 3-2 and 4-1. Each of these agencies could provide Huntington Beach with limited water supply in the event of an emergency, if these supplies are available. Conversely, the City could provide emergency water to these cities, if available from either groundwater or imported water sources. Imported water is also supplied to Huntington Beach from OC-44 via a 24- to 42-inch transmission main jointly owned by the City and Mesa Consolidated Water District. In an emergency the City could receive water from this source from Mesa and vice versa.

3.3.8 Supply Reliability

Available water supplies compared to demands determine one component of an agency's overall supply reliability. The City's ability to pull from different sources such as imported water from Metropolitan and groundwater provide a certain degree of reliability. Other local sources such as recycled water can also provide additional supply reliability. However, just because an agency has more supply than demand does not necessarily make the system reliable. For example, all of its supply could come from one source that might be susceptible to interruptions in service from droughts, earthquakes or other elements.

The more different sources or sources with a high degree of reliability an agency has, the more reliable their supply will be. The City is fortunate to overly the Orange County Groundwater Basin (Basin), which has been able to sustain BPPs from the mid-60s to 70 percent throughout past years. During preparation of the City's 2010 UWMP, Orange County Water District who manages the Basin conservatively projected that a BPP of 62 percent could be maintained throughout the next twenty-plus years. This means that the City can reasonably count on at least 62 percent of its projected demands being met by local groundwater produced from City wells overlying the Basin. However, due to current favorable basin conditions, the continuing move toward water conservation, and the expanded GWRS projections, OCWD staff has indicated that they are looking to increase the BPP to 68% for 2012/13 and feels that agencies could easily use 65% as a conservative BPP projection for long-term planning. Imported water is less reliable in that Metropolitan's main sources are the State Water Project which is subject to climate patterns including drought and other environmental constraints and Colorado River Water which also has limitations. However, Metropolitan has projected in its long range water planning documents, including its 2010 Regional UWMP and 2010 Integrated Water Resources Plan (IRP), that supplies will be sufficient to meet projected demands during normal, single dry and multiple dry years through the year 2035.

As discussed in detail in the City's 2010 UWMP, there are additional local programs that were not counted on due to the relatively conservative approach taken in the UWMP that could make the City's overall supply reliability picture even more secure. A couple of these programs include local stormwater capture and reuse and the potential desalination project.

Given the above, the ability of the City to reliably produce sufficient quantities of groundwater from the Basin and imported water from its available wells and turnout facilities, respectively, will be analyzed. Existing City wells with their year of construction, depths, pumping capacities and normal operating capacities are listed in Table 3-5. The reason the normal operating capacities are lower than those listed under the "Capacity" column may be due to the fact that some of the City's wells are not operated at 100 percent capacity in consideration of several factors including groundwater level, water quality, availability of in-lieu water, etc. Additionally, the life of the wells and associated supply equipment can be prolonged when operating at less than capacity resulting in the normal operating supply values shown in Table 3-5, which total 18,150 gpm or about 72% of total capacity.

Table 3-5
Well Capacities

	Year Drilled	Well Depth (feet)	Capacity (gpm)	Normal Operating Capacity (gpm)
Well No. 1	1962	306	750	350
Well No. 3A	1994	716	2,500	1,750
Well No. 4	1967	804	500	450
Well No. 5	1969	820	3,000	3,000
Well No. 6	1973	810	3,000	2,500
Well No. 7	1975	891	3,400	3,400
Well No. 9 [a]	1981	996	3,000	1,500
Well No. 10	1981	960	3,400	2,700
Well No. 12[b]	2006	800	3,000	-
Well No. 13	2001	800	2,500	2,500
Total Groundwater			**25,050**	**18,150**

Source: City of Huntington Beach 2010 UWMP.

(a) Well 9 operating capacity reduced to allow for sufficient blending with other sources in order to address higher level of dissolved Hydrogen Sulfide.

(b) Well 12 taken out of service due to water quality issues (high chloride). May be reinstated with production reduced to 500-750 gpm; schedule to be determined.

Imported water can be supplied directly into the City's Zone 1 via three turnouts, OC-9 at 6,300 gpm, OC-35 at 9,000 gpm, and OC-44 at 6,700 gpm, for a total imported supply availability of 22,000 gpm, as shown on Table 3-4.

Determining the amount pumped from each of the City's supply facilities from month to month is fairly complex due to many variables. First, the City's demand fluctuates with higher demands in summer than winter. Additionally, the BPP typically varies to some degree from year to year based on weather and Basin conditions. And finally, in-lieu water is available from Metropolitan in certain years in certain months when surplus imported water is available (Metropolitan provides imported water in wet years at rates similar to groundwater costs to encourage use of surplus imported supplies and, in essence, increase levels in the Basin for use in dry years). Table 3-6 shows a typical hypothetical annual operational scenario using projected 2015 demands from the City's 2010 UWMP and applying monthly demand distribution based on the average of monthly demand factors from the past five years (FY 2007 through FY 2011). For example, over that period the highest monthly average was August with a factor of 1.45 times average annual demand and the lowest month was February with a factor of 0.81 times average.

Table 3-6
2015 Monthly Demand/Supply Projections
(acre-feet)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2015 Demand	3,222	3,546	3,112	2,962	2,532	2,301	2,210	1,997	2,169	2,511	2,819	3,235	32,616
Supply Source													
Groundwater	2,095	2,305	2,023	1,925	1,646	1,496	1,437	1,298	1,410	1,632	1,832	2,103	21,200
Imported	1,128	1,241	1,089	1,037	886	805	774	699	759	879	987	1,132	11,416
Groundwater (Operating Capacity)													
Well 1	48	48	46	48	46	48	48	43	48	46	48	46	564
Well 3A	240	240	232	240	232	240	240	217	240	232	240	232	2,822
Well 4	62	62	60	62	60	62	62	56	62	60	62	60	726
Well 5	411	411	398	411	398	411	411	371	411	398	411	398	4,838
Well 6	342	342	331	342	331	342	342	309	342	331	342	331	4,032
Well 7	466	466	451	466	451	466	466	421	466	451	466	451	5,483
Well 9	205	205	199	205	199	205	205	186	205	199	205	199	2,419
Well 10	370	370	358	370	358	370	370	334	370	358	370	358	4,354
Well 13	342	342	331	342	331	342	342	309	342	331	342	331	4,032
Total GW Capacity	2,486	2,486	2,406	2,486	2,406	2,486	2,486	2,245	2,486	2,406	2,486	2,406	29,272
GW Surplus	**391**	**181**	**383**	**561**	**760**	**990**	**1,049**	**947**	**1,076**	**774**	**654**	**303**	**8,071**
Imported Water	3,013	3,013	2,916	3,013	2,916	3,013	3,013	2,722	3,013	2,916	3,013	2,916	35,481
Imported Surplus	1,886	1,772	1,827	1,977	2,030	2,208	2,240	2,023	2,254	2,037	2,027	1,784	24,065
Total Capacity	5,500	5,500	5,322	5,500	5,322	5,500	5,500	4,967	5,500	5,322	5,500	5,322	64,753
Total Surplus	2,277	1,954	2,210	2,538	2,790	3,199	3,289	2,970	3,331	2,811	2,681	2,087	32,137

The first row in Table 3-6 shows the projected 2015 demand proportioned across each month based on the average factors for each month as discussed above. The next two rows show the monthly demand split between groundwater and imported water using a BPP of 65 percent, assuming no in-lieu water for simplicity. It is understood that this scenario is somewhat simplified in that an exact BPP is not typically maintained each and every month but at the end of the year it is important to hit the BPP as close as possible since over pumping from the Basin results in Replenishment Assessments over and above normal groundwater pumping rates and taking more imported water is more expensive than groundwater pumped at or below the BPP.

Table 3-6 does illustrate an important point, though. All the groundwater rows and columns show the normal operating pumping rates from Table 3-5 times the number of days in each month converted to acre-feet for each well and then a total for all of the nine wells. The "GW Surplus" row is the difference between the total of all Well Operating Capacities minus the Groundwater Demand from the second row of the table. Table 3-6 shows that the total Surplus Groundwater Pumping Capacity projected for Year 2015 is 8,071 acre-feet, which is substantial. However, in June through September the Surplus Groundwater Pumping Capacity is below 400 acre-feet for each month and for August is below 200 acre-feet. During that summer period, if a large capacity producing well, such as Well 7, were to be down for the month, the BPP could not be maintained in any of those four months. If this were to occur, other wells could perhaps be pumped at higher rates to compensate during such an outage. Alternatively, more groundwater could be pumped in winter months when there is significantly more surplus to catch up with the BPP. However, this analysis does show that there is marginal surplus groundwater production capacity in certain times of the year. This becomes even more significant when you consider that Wells 4, 7, and 13 are all located in close proximity to one another at the Peck/Springdale Reservoir complex and in the area where higher chloride content exists in the Basin. This fact is illustrated on Figure 3-2 by comparing City well locations with the 250 mg/l Chloride concentration lines as developed by OCWD from monitoring in recent years. If the City were to lose these three wells for a year with projected 2015 demands and assuming the Normal Operating Pumping Capacities shown in Table 3-6, they would be almost 2,170 acre-feet short of meeting the assumed BPP of 65 percent.

A similar table was prepared using projected 2035 demands and that scenario is illustrated in Table 3-7. Granted these are demand projections some 25 years in the future but they show that there is only 37 acre-feet of surplus well capacity in the month of August, which is just slightly more than the production volume of the largest well for two days. The demands, BPP, and monthly peaking can be easily modified in the Excel files created to generate Tables 3-6 and 3-7 (included as a deliverable to the City) to analyze differing scenarios and assess their impacts. Needless to say, as demands increase and with increases in the BPP, the City's groundwater pumping capacity becomes less and less reliable, especially in summer months. Additionally, in drier years the monthly demand distribution would be more extreme (i.e. higher summer peak use) than the average monthly distributions used in this analysis, further exacerbating this condition.

Table 3-7
2035 Monthly Demand/Supply Projections
(acre-feet)

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2035 Demand	3,424	3,768	3,307	3,147	2,690	2,445	2,349	2,122	2,304	2,668	2,995	3,437	34,657
Supply Source													
Groundwater	2,226	2,449	2,150	2,045	1,749	1,589	1,527	1,379	1,498	1,734	1,947	2,234	22,527
Imported	1,198	1,319	1,158	1,101	942	856	822	743	807	934	1,048	1,203	12,130
Groundwater (Operating Capacity)													
Well 1	48	48	46	48	46	48	48	43	48	46	48	46	564
Well 3A	240	240	232	240	232	240	240	217	240	232	240	232	2,822
Well 4	62	62	60	62	60	62	62	56	62	60	62	60	726
Well 5	411	411	398	411	398	411	411	371	411	398	411	398	4,838
Well 6	342	342	331	342	331	342	342	309	342	331	342	331	4,032
Well 7	466	466	451	466	451	466	466	421	466	451	466	451	5,483
Well 9	205	205	199	205	199	205	205	186	205	199	205	199	2,419
Well 10	370	370	358	370	358	370	370	334	370	358	370	358	4,354
Well 13	342	342	331	342	331	342	342	309	342	331	342	331	4,032
Total GW Capacity	2,486	2,486	2,406	2,486	2,406	2,486	2,486	2,245	2,486	2,406	2,486	2,406	29,272
GW Surplus	**260**	**37**	**256**	**441**	**657**	**897**	**959**	**866**	**988**	**671**	**539**	**172**	**6,745**
Imported Water	3,013	3,013	2,916	3,013	2,916	3,013	3,013	2,722	3,013	2,916	3,013	2,916	35,481
Imported Surplus	1,815	1,695	1,759	1,912	1,975	2,158	2,191	1,979	2,207	1,982	1,965	1,713	23,351
Total Capacity	5,500	5,500	5,322	5,500	5,322	5,500	5,500	4,967	5,500	5,322	5,500	5,322	64,753
Total Surplus	2,075	1,732	2,015	2,353	2,632	3,055	3,151	2,845	3,195	2,654	2,504	1,885	30,096

These analyses do illustrate that the City has plenty of surplus imported water capacity even in the higher demand months based on the high volume of turnout capacity. The fact that the three turnouts are located at different points on the City distribution system is an added plus for imported water reliability.

3.3.9 Groundwater Well Study

In conclusion, to be prepared for a potential loss of one or more wells due to any number of factors, a separate well study should be completed to assess the condition of each of the City's existing wells, determine their remaining useful life, and develop a systematic approach to replacement of wells in their same general location and/or the addition of new wells at future locations. From the 1995 Water Master Plan, Well No. 1 was already identified to be separately evaluated regarding the feasibility of re-drilling it with its capacity increased to approximately 750 gpm. The current year Capital Improvement Program included a project to address the presence of higher levels of dissolved Hydrogen Sulfide at Well No. 9, which is currently operating at a reduced capacity of 50 percent to accommodate required blending. The recommended well study would address the future of these two wells as well as the need for and phasing of any additional wells and recommended locations for these wells.

4 FACILITIES AND OPERATION

4.1 Existing Facilities Summary

The City's existing potable water system facilities and pipelines are shown on Figure 4-1. The City's existing storage system consists of four reservoirs (Overmyer, Peck, Springdale and Edwards Hill), all located in the lower pressure zone (Zone 1), with a combined storage capacity of 55.0 million gallons (MG). The Peck and Springdale reservoirs are located at the same site. Booster stations are located at the three reservoir sites to pump water from the reservoirs into the distribution system.

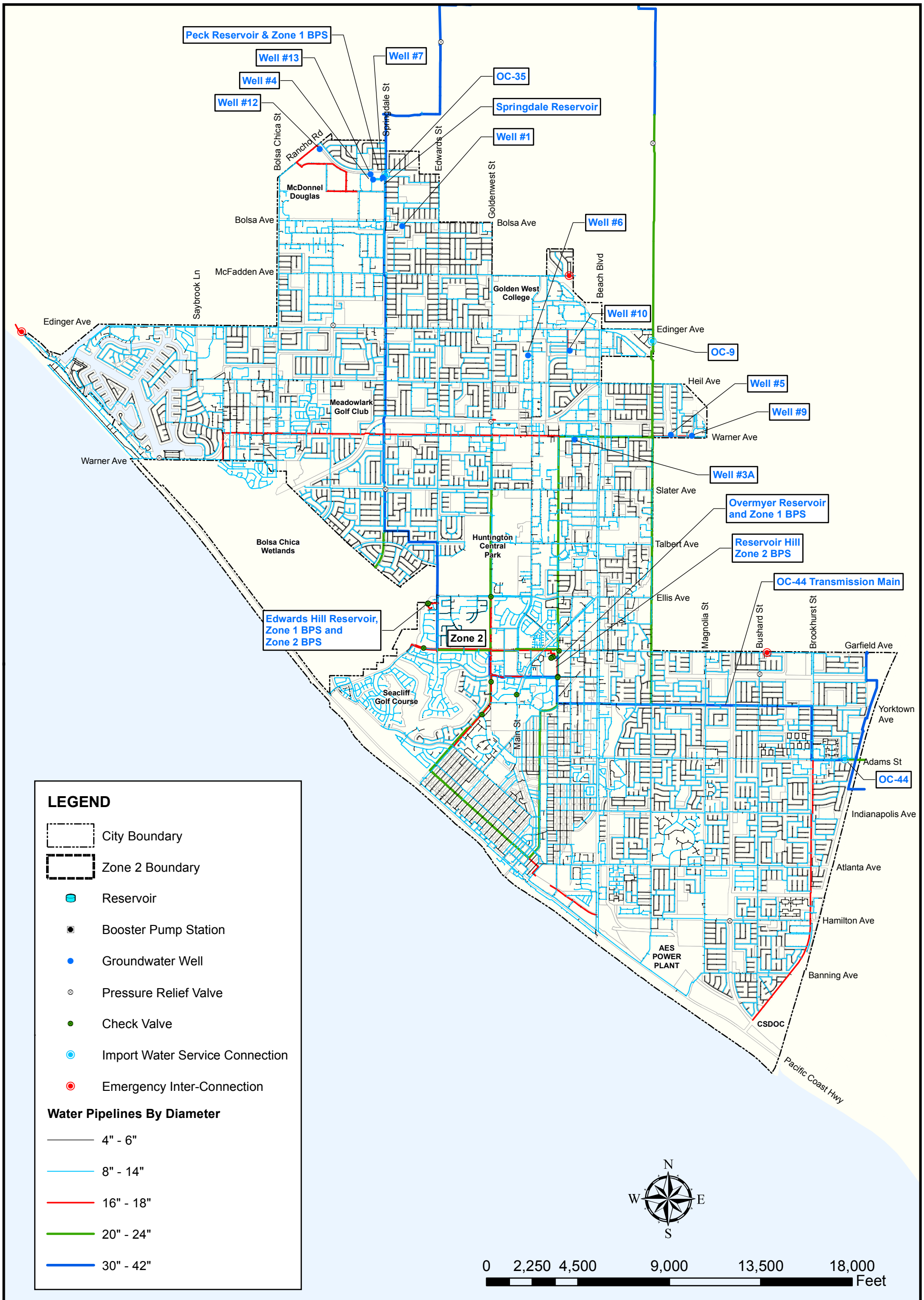
The City's service area is composed of two pressure zones: Zone 1 and Zone 2. Ground elevations in Zone 1 vary between 5 feet below and 80 feet above sea level. The Overmyer, Peck and Edwards Hill booster pump stations boost water from their respective reservoirs into the Zone 1 distribution system. Zone 2 is the 800 acre Reservoir Hill area that rises to an elevation of 109 feet. The Reservoir Hill Booster Pump Station, which is located at the Overmyer site, boosts water from Zone 1 into Zone 2. The Edwards Hill Booster Pump Station also has Zone 2 pumps. Neither of the Zone 2 booster pump stations have a direct connection to pump from a storage reservoir.

In addition to the four booster pump stations, the City's existing potable water distribution system includes ten well facilities that pump directly into the distribution system (with the exception that Well 4 pumps directly into Peck Reservoir); three imported water service connections; four emergency water connections with neighboring public water systems; and 620 miles of transmission and distribution piping ranging in size from 4 inches to 42 inches in diameter.

One City well, Meadowlark No. 2, is used solely for irrigation of the Meadowlark Golf Course and is not part of the potable water system. A separate, nonpotable water distribution system does not currently exist nor is one planned to be implemented in the near future. However, the potential for reducing demands on the potable water system through implementation of local projects such as capture and beneficial use of storm runoff for City landscape irrigation does exist and is discussed in the City's 2010 Urban Water Management Plan.

4.2 System Operation

Ten existing potable water wells (Well Nos. 1, 3A, 4, 5, 6, 7, 9, 10, 12 and 13) can pump directly into the distribution system. Well No. 9 is currently operating at 50 percent capacity due to the presence of higher levels of dissolved Hydrogen Sulfide. Well No. 12 is currently out of service due to water quality issues (high chloride) and may be reinstated with production reduced with a schedule to be determined. The wells are typically used to satisfy system demands during the day and to fill the four system reservoirs at night when system demands are lower.



City of Huntington Beach
2012 Water Master Plan

Existing Potable Water System Facilities

Figure 4-1

The total combined well supply capacity for the City, assuming all ten wells are operating would be approximately 25,050 gpm with a current normal operation capacity of approximately 18,150 gpm, as described in Chapter 3.

The pumps at Well Nos. 1 and 5 have constant speed motors. The pumps at the other well sites can be operated at variable speeds via natural gas engines and are generally operated to maintain constant flow.

The Overmyer, Reservoir Hill, Peck, and Edwards Hill booster pump stations are controlled by system pressure at the respective complex. The lead pump at a station is activated to start when the system pressure drops to a specified level. Pumps are added or removed as necessary based on increased or decreased demand as sensed by an increase or decrease in system pressure.

All of the pumps at the four booster pump stations can be operated at variable speeds. Edwards Hill booster station is a hybrid system, which can operate either by variable-frequency electric motors or variable speed natural-gas engines. Overmyer and Peck booster stations both only operate by variable speed natural-gas engines, but design is underway to rehabilitate Peck booster station to become a hybrid system in around 2013. Reservoir Hill booster station only services Zone 2 and is primarily operated by variable speed natural-gas engines, with the exception of one small pump operated by variable-frequency electric motors. The Overmyer, Peck and Edwards Hill booster pump stations are operated to maintain constant discharge pressures, which correspond to a discharge hydraulic grade line (HGL) of approximately 180 feet for the Overmyer and Edwards Hill booster pump stations and 189 feet for the Peck Booster Pump Station. The Zone 2 Reservoir Hill Booster Pump Station and the Zone 2 pumps at the Edwards Hill Booster Pump Station are operated to maintain a constant discharge pressure, which corresponds to a discharge HGL of approximately 230 feet.

At each booster pump station, the lead pump is shut off when operating at its minimum speed and decreasing demand causes the pump discharge pressure to rise to the specified stop pressure and system pressure remains above this set point for a specified time. When the respective booster pump station is off-line, various pressure control valves automatically throttle to maintain system pressure by allowing system water to flow into the reservoirs.

Imported water is supplied to the City via three service connections: OC-9, OC-35 and OC-44. The City's allocated capacities from these connections are 6,300 gpm, 9,000 gpm, and 6,700 gpm, respectively. OC-9 and OC-35 are operated on a fixed-flow basis with prior notification to MWD required in order to change flow settings. Flows from OC-44 can be changed without notifying MWD. All three connections supply water directly to Zone 1.

System pressures throughout the City are generally maintained between 50 and 72 psi during normal operation. The tight range is attributable to the flat terrain of the City and to the utilization of variable-speed pump drives at the booster pump stations to maintain system pressures.

4.3 Storage Reservoirs and Booster Pump Stations

The characteristics of the existing storage reservoirs are shown in Table 4-1. The storage capacities of the four existing reservoirs total 55.0 million gallons (MG).

Table 4-1
Existing Storage Reservoir Characteristics

Reservoir	Location	Dimensions (ft)	Maximum Water Depth (ft)	High Water Elevation (ft)	Capacity (MG)
Overmyer	Zone 1	441 x 198	48.5	71.8	20.0
Edwards Hill	Zone 1	213 dia.	34.0	84.0	9.0
Springdale	Zone 1	448 x 143	24.0	35.5	9.0
Peck	Zone 1	541 x 210	23.5	33.7	17.0
Total					55.0

The characteristics of the existing booster pump stations are shown in Table 4-2. A 10-MG storage reservoir and 11,000-gpm booster pump station was included in the 2000 Master Plan at the AES property in the southeast quadrant of the City to provide storage and supply to the area south of the Newport-Inglewood fault and east of Bolsa Chica. In 2005, the City purchased the future tank property from AES Huntington Beach Development, LLC. This reservoir and booster pump station, which are still included as a water master plan project in this water master plan, are discussed in Chapters 5 and 7.

4.3.1 Overmyer Reservoir and Booster Pump Station

The Overmyer Reservoir and the associated booster pump station are located at the City's Utilities Division Yard. The reservoir, which was constructed in 1971, was formed by excavating into natural soils and constructing an embankment of the excavated material. The vertical walls are 25 feet high and the 1.5:1 sloping sides are 22 feet high.

The reservoir was rehabilitated in 2003/04, in accordance with the 1995 Water Master Plan. The work included strengthening the wall footing, installation of a new concrete wall liner, construction of a new roof structure with new roof support columns and column base plates, and construction of gunite floors and slopes. In conjunction with the reservoir rehabilitation, a new booster pump station was also constructed.

The pumping capacity of the Overmyer Booster Pump Station is 20,000 gpm with all four pumps in operation and 13,500 gpm with one of the largest pumps (6,500 gpm) out of service (acting in stand-by as a backup). The pump station is operated to maintain a constant discharge pressure, which corresponds to a discharge hydraulic grade line (HGL) of 180 feet. All four pumps have variable-speed operation via natural-gas engines. Two 3,900-gallon liquefied propane gas (LPG) tanks and associated equipment are

located at the site to provide backup propane gas supply for operation of the Overmyer and Reservoir Hill booster pumps.

Table 4-2
Existing Booster Station Characteristics

Station	Pump	Zone	Electric Motor (EM) or Natural Gas Engine Drive (NG)			Pump Design Point		
			Speed	Horse-Power	Type	Flow (gpm)	HGL (ft)	RPM
Overmyer[a]	1	Zone 1	Variable	409	NG	6,500	160	1,160
	2	Zone 1	Variable	409	NG	6,500	160	1,160
	3	Zone 1	Variable	150	NG	3,500	115	1,190
	4	Zone 1	Variable	150	NG	3,500	130	1,160
						20,000[d]		
Reservoir Hill	1	Zone 2	Variable	10	EM	400	52	1,770
	2	Zone 2	Variable	25	NG	1,500	114	1,180
	3	Zone 2	Variable	25	NG	1,500	114	1,180
	4	Zone 2	Variable	75	NG	3,500	51	1,160
	5	Zone 2	Variable	75	NG	3,500	51	1,160
						10,400[d]		
Peck	1-4	Zone 1	Variable	330	NG[f]	4,635	189	1,200
						18,540[d]		
Edwards Hill	1-4	Zone 1	Variable	150	Dual[c]	2,500	160	1,780
						7,500[e]		
Edwards Hill	5-7	Zone 2	Variable	25/45[b]	Dual[c]	1,250	52	1,760
						3,750[d]		

(a) The Overmyer Zone 1 Pumps can also be used to pump to Zone 2 in an emergency.
(b) The motors are 25 hp and the engines are 45 hp.
(c) The pumps can be driven either by natural gas combustion engines with variable speed, right angle gear drives or by variable frequency electric motors.
(d) The total capacity includes all zone pumps in the station; however, see text description for each station to determine rated capacity, which is capacity with the largest pumping unit out of service.
(e) Edwards Hill Zone 1 station actually includes four 2,500 gpm pumps but only three can be used at a time due to current piping restrictions; thus 7,500 gpm is total capacity, which is same as rated capacity.
(f) Design is underway to rehabilitate the Peck booster station to become a hybrid system in around 2013, by providing the capability to operate the station with variable-frequency electric motors.

4.3.2 Reservoir Hill Booster Pump Station

The Reservoir Hill Booster Pump Station is located on the same site as the Overmyer Reservoir and Booster Pump Station. The pump station boosts water from Zone 1 to the 800-acre Reservoir Hill area that constitutes Zone 2 of the water system. Zone 2 has a high ground elevation of 109 feet. The booster pump station has a pumping capacity of 10,400 gpm with all five pumps in operation and 6,900 gpm with the largest pump (3,500 gpm) out of service. Pump No. 1 is driven with a variable frequency electric motor. The other four pumps (Pump Nos. 2 through 5) have variable-speed operation via a natural-gas engine. The pump station is operated to maintain a constant discharge pressure, which corresponds to a discharge HGL of approximately 230 feet.

4.3.3 Peck and Springdale Reservoirs and Peck Booster Pump Station

The 17.0 MG Peck Reservoir, the 9.0 MG Springdale Reservoir and the Peck Booster Pump Station are located at the same site, west of Springdale Street at the northern end of the City. Well Nos. 4, 7, and 13 are also located at this site. The Peck Reservoir was constructed in 1966. In 1995, the reservoir was rehabilitated with seismic upgrades and a new booster pump station was constructed. The Springdale Reservoir was constructed in 2003, in accordance with the 2000 Water Master Plan. Both reservoirs are above-ground, concrete, rectangular reservoirs with the dimensions shown in Table 4-1. The Peck Booster Pump Station boosts water from both the Peck Reservoir and the Springdale Reservoir into the Zone 1 distribution system. The pump station is operated to maintain a constant discharge pressure, which corresponds to a discharge HGL of approximately 189 feet.

The pumping capacity of the Peck Booster Pump Station is 18,540 gpm with all four pumps in operation and 13,905 gpm with one pump out of service. Pump Nos. 1 through 4, each rated at 4,635 gpm, have variable-speed operation via natural-gas engines. A 10,000-gallon LPG tank and associated equipment are located at the site to provide backup propane gas supply for operation of the engine-driven booster pumps and the engine-driven pumps at Well Nos. 4, 7 and 13. Design is underway to rehabilitate the Peck booster station to become a hybrid system in around 2013, by providing the capability to operate the station with variable-frequency electric motors.

4.3.4 Edwards Hill Reservoir and Booster Pump Station

The 9.0 MG Edwards Hill Reservoir and Booster Pump Station are located at the corner of Edwards Street and Overlook Drive. The reservoir and pump station were constructed in 2001. The prestressed-concrete, circular reservoir is above-ground, with the dimensions shown in Table 4-1.

The Edwards Hill Reservoir Pump Station houses both Zone 1 and Zone 2 pumps. In 2001, the Zone 1 pumping system was upgraded with larger capacity pumping assemblies, variable frequency motors and natural gas engines. While the size of each new pump nearly doubled, from 1,500 gpm to 2,500 gpm, no improvements to the suction or discharge piping were made. Therefore, only three of the four pumps can

operate at a time due to piping restrictions and total capacity is limited to 7,500 gpm (3 x 2,500), up from the 6,000 gpm previous total capacity (4 x 1,500). However, the reliability was greatly improved as the rated capacity (one pump out of service) is now 7,500 gpm vs. the previous rated capacity of only 4,500 gpm (3 x 1,500). The Zone 1 pumps are operated to maintain a constant discharge pressure, which corresponds to a discharge HGL of approximately 180 feet. The pumping capacity of the Zone 2 pumps is 3,750 gpm with all three pumps in operation and 2,500 gpm with one of the three 1,250-gpm pumps out of service. The Zone 2 pumps are operated to maintain a constant discharge pressure, which corresponds to a discharge HGL of approximately 230 feet.

All of the pumps (Zone 1 and Zone 2) have variable speed operation via dual drives, i.e. either a variable-frequency motor or a natural-gas engine. A 2,000-gallon LPG tank and associated equipment are located at the site to provide backup propane gas supply for operation of the engine driven pumps.

4.4 Potable Water Well Pumps

The characteristics of the existing potable water well pumps and corresponding drives are shown in Table 4-3. The pumps at Well Nos. 4, 6, 7, 9, 10, and 13 can be operated at variable speeds via natural gas engines and are generally operated to maintain constant flow. The pump at Well No. 12 can be operated at variable speeds via a variable frequency drive electric motor and also is operated to maintain a constant flow. The pumps at Well Nos. 1 and 5 are driven by constant-speed electric motors.

Table 4-3
Existing Potable Water Well Pump Characteristics

	Electric Motor (EM) or Natural Gas Engine (NG)			Pump Design Point		
Well	Speed	Horsepower	Type	Flow (gpm)	HGL (ft)	RPM
Well No. 1	Constant	75	EM	600	320	1,770
Well No. 3A	Variable	350	EM	4,000	263	1,775
Well No. 4	Variable	49	NG	500	252	1,775
Well No. 5	Constant	400	EM	4,000	263	1,775
Well No. 6	Variable	395	NG	3,340	330	1,190
Well No. 7	Variable	409	NG	4,000	300	1,200
Well No. 9	Variable	338	NG	3,000	408	1,775
Well No. 10[a]	Variable	395	NG	4,000	308	1,775
Well No. 12	Variable	400	EM	3,400	365	1,760
Well No. 13	Variable	330	NG	4,000	308	1,770

(a) In 2011, Well 10 was retrofitted with improvements designed such that the addition of an EM and VFD will be facilitated easily in the future.

A 10,000-gallon LPG tank and associated equipment provide backup propane gas supply for operation of the engine-driven pumps at Well Nos. 4, 7, and 13, and the engine-driven pumps at the Peck Booster Pump Station. In accordance with the 1995 Water Master Plan recommendations to provide energy back-up at well sites, the City purchased a portable trailer-mounted 500 gallon propane storage vessel in 2010 and constructed vaporizers at Well Site Nos. 6, 9, and 10.

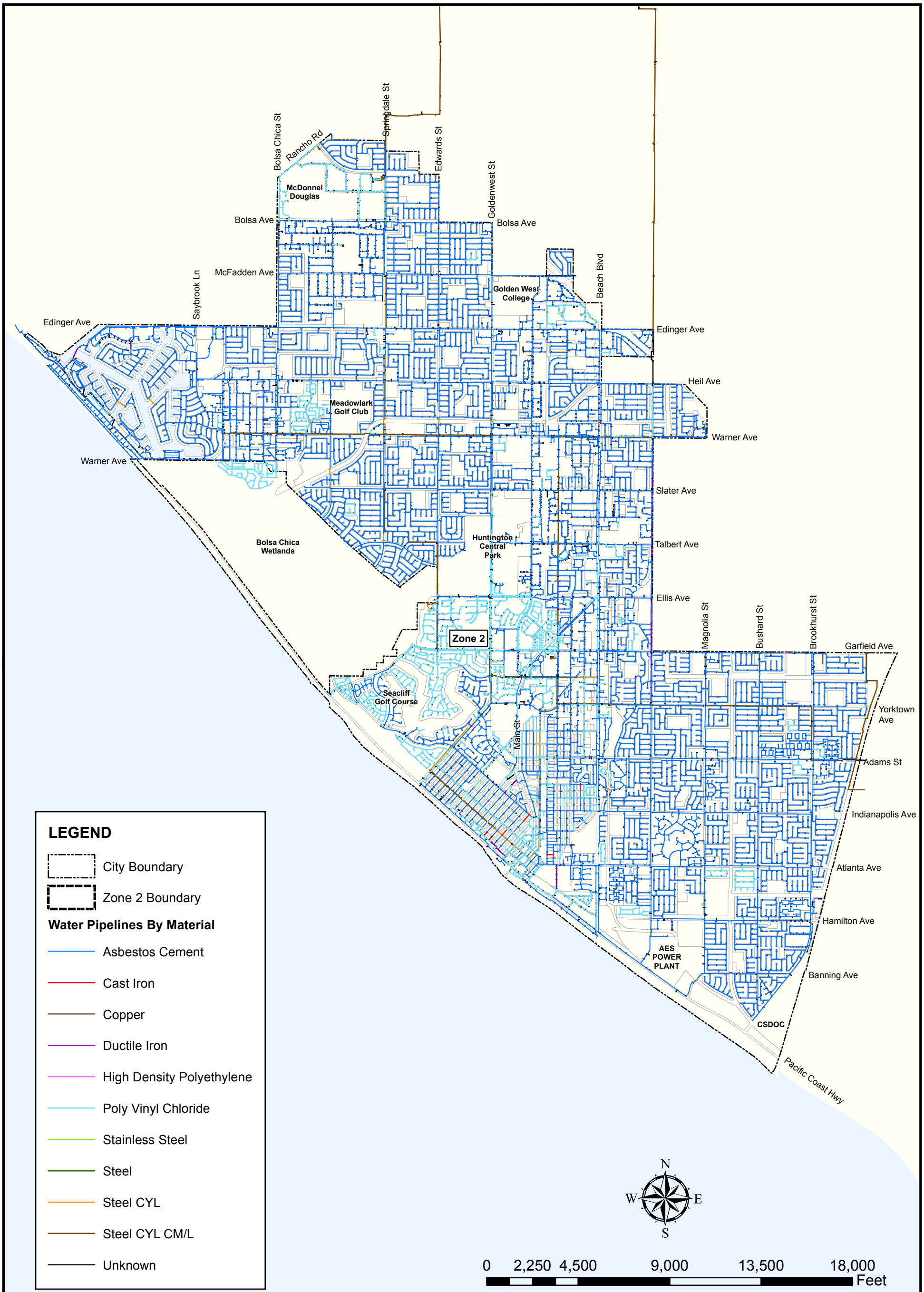
4.5 Transmission and Distribution Piping

As shown in Table 4-4, there are approximately 620 miles of transmission and distribution piping in the water system with sizes ranging from 4- to 42-inches in diameter. The majority of the piping in the system is 6 to 8 inches in diameter (73%) and the most common material is asbestos cement (AC) pipe (76%). Figure 4-2 shows these different pipe materials with the City's system graphically.

Table 4-4
Transmission and Distribution System Mains

Pipe Diameter (inches)	Length (feet)							
	Asbestos Cement	Cast Iron	Ductile Iron	PVC	STL CYL	STL CYL CML	Unknown	Total
4	34,741	651	97	6,368	0	54	14,088	55,999
6	932,805	1,289	878	30,473	213	15	122,349	1,088,022
8	1,064,140	0	1,645	237,898	1,548	64	7,309	1,312,604
10	41,841	0	0	12,410	92	122	3,037	57,502
12	364,513	0	2,033	119,415	1,318	2,194	798	490,270
14	9,590	0	0	175	2,052	214	2	12,032
15	0	0	0	0	0	3,390	0	3,390
16	26,664	0	0	16,118	0	14,022	127	56,931
18	0	0	0	7,409	871	237	0	8,516
20	0	0	5,087	9,631	16,702	4,039	56	35,515
21	0	0	0	0	403	16,445	0	16,848
22	0	0	0	0	0	0	0	0
24	1,343	0	7,641	10,031	584	11,115	4,173	34,887
27	0	0	0	0	25	5,845	0	5,869
28	0	0	0	0	0	8,169	0	8,169
30	0	0	0	0	2,631	15,591	1	18,223
33	0	0	0	0	0	12,199	0	12,199
36	0	0	0	0	12,817	22,715	0	35,532
42	0	0	0	0	2,439	17,742	0	20,181
Total (Feet)	2,475,637	1,941	17,380	449,928	41,694	134,171	151,938	3,272,689
Total (Miles)	468.7	0.4	3.3	85.2	7.9	25.4	28.8	619.6
Pct.	75.6%	0.1%	0.5%	13.7%	1.3%	4.1%	4.6%	100.0%

PVC = Polyvinyl Chloride, STL CYL = Steel Cylinder, CML = Cement Mortar Lined



City of Huntington Beach
2012 Water Master Plan

Transmission and Distribution Piping by Material

Figure 4-2

The transmission mains constitute the majority of the steel pipe in the system. Water transmission pipelines associated with the three imported water service connections are vital to transmit water throughout the City and to all water storage facilities. Corrosion protection of the 30-inch, 36-inch, and 42-inch pipelines was included in the 1995 Water Master Plan. All transmission mains with the exception of the 36-inch main have been completely retrofitted with corrosion protection systems. However, the vital transmission mains upstream of the City's three imported water service connections that are either jointly owned with the West Orange County Water Board or Mesa Consolidated Water District have not been installed with any corrosion protection systems. Therefore, separate feasibility and implementation studies are necessary to begin the process of installing similar corrosion protection systems on these vital transmission mains.

The 36-inch to 42-inch OC-35 transmission main begins at a connection with the West Orange County Water Board Feeder No. 2 connection at Glenwood Drive/Springdale Street and runs south on Springdale Street and Edwards Street, then east on Clay Street to a connection with the OC-44 transmission main at Huntington Street, which is near to the Overmyer facilities. A non-rectified corrosion protection system was recently installed in 2009 for this transmission pipeline that included insulating fittings/test stations and all necessary appurtenances, including replacement of valves for the 42-inch coal-tar enamel coated steel water main. The 36-inch mortar coated steel water main is scheduled to undergo similar cathodic protection improvements, including an impressed current rectifier corrosion protection system with necessary appurtenances, beginning in late 2012.

The 30-inch transmission main begins at the jointly owned OC-44 service connection with Mesa Consolidated Water District at Adams Avenue and the Santa Ana River and runs west on Adams Street, north on Brookhurst Street, west on Yorktown Avenue, then north on Huntington Street to a connection with the 42-inch transmission main in Clay Street. An impressed current rectifier corrosion protection system was installed in 2012 for this transmission pipeline that included insulating fittings/test stations, an all necessary appurtenances, including replacement of valves for the 30-inch coal-tar enamel coated steel water main.

In accordance with the 1995 Water Master Plan, beginning at the West Orange County Water Board Feeder No. 1 connection at Edinger Avenue and Newland Street, a new 20-inch to 24-inch transmission main was constructed in 2007, running south on Newland Street to a connection with the OC-44 transmission main in Yorktown Avenue. The new transmission main is primarily ductile iron pipe, with some segments being Polyvinyl Chloride (PVC), and was installed with a non-rectified corrosion protection system.

In 2011, the remaining 2.5 miles of the original 21-inch OC-9 coal-tar enamel coated steel transmission main was extensively re-evaluated by a corrosion specialist. Their finding was extremely favorable in that the transmission main was found to be in very good condition.

Another transmission main in the system is the Downtown Loop that transmits water around and through the Downtown area. The 20-inch steel transmission main has an

impressed current rectifier system for corrosion protection that was retro-fitted in 2007. The 20-inch steel transmission main connects with the 30-inch OC-44 transmission main at Yorktown Avenue/Huntington Street and runs west on Yorktown Avenue, then south on Lake Street, then west on Olive Street through Downtown, then north on Goldenwest Street to a connection with the 42-inch OC-35 transmission main on Clay Street.

The remaining distribution system is a well-gridded system with the majority of the arterial grids composed of 12-inch or larger diameter Asbestos Cement (AC) pipe.

Originally, only 1% of the piping in the system consisted of cast iron (35,000 linear feet). However, even this small amount is significant because unlined and uncoated cast iron pipe is prone to severe interior and exterior corrosion, respectively. Unlined cast iron pipe loses much of its original carrying capacity with age due to interior pipeline tuberculation. This is especially true for small diameter pipe.

Up until 2005, there was a substantial amount of cast iron pipe in the City's distribution system, the majority of which was 8 inches in diameter or smaller. Some of this pipe dated back 75 to 100 years based on City records. In accordance with the 2000 Water Master Plan, the City undertook an aggressive cast iron main replacement program and currently all but 2,000 linear feet of cast iron pipe remain, all in the Downtown area.

4.6 Distribution System Treatment

Gaseous chlorine (CL_2) is injected at all of the well sites to disinfect the water. The City receives imported water that has been disinfected by MWD by means of chloramination. The City disinfects at each of its well sites through the injection of gaseous chlorine (CL_2) typically at a rate of about 1.0 milligram per liter (mg/l) residual, while the imported water disinfected by chloramination, is typically at a rate of about 2.2 mg/l residual.

In accordance with the 1995 Water Master Plan, chlorination facilities at Well Site Nos. 6, 7, 9 and 10 were all upgraded by 2002. The upgrades included room modifications, some building construction, and the installation of secondary containment vessels with CL_2 leak monitors and earthquake sensors. In accordance with the 2000 Water Master Plan, similar chlorination upgrades were constructed at Well No. 13 and completed by 2010.

The City has fluoridated its water supply since 1972. The natural fluoride concentration of the groundwater ranges from 0.3 to 0.4 mg/l, and the City increases the fluoride concentration to between 0.70 and 1.30 mg/l. The natural fluoride concentration of the imported water supply has a fluoride content of 0.2 mg/l, and MWD increase the fluoride concentration to 1. 0 mg/l.

5 STORAGE AND EMERGENCY SUPPLY

5.1 Overview

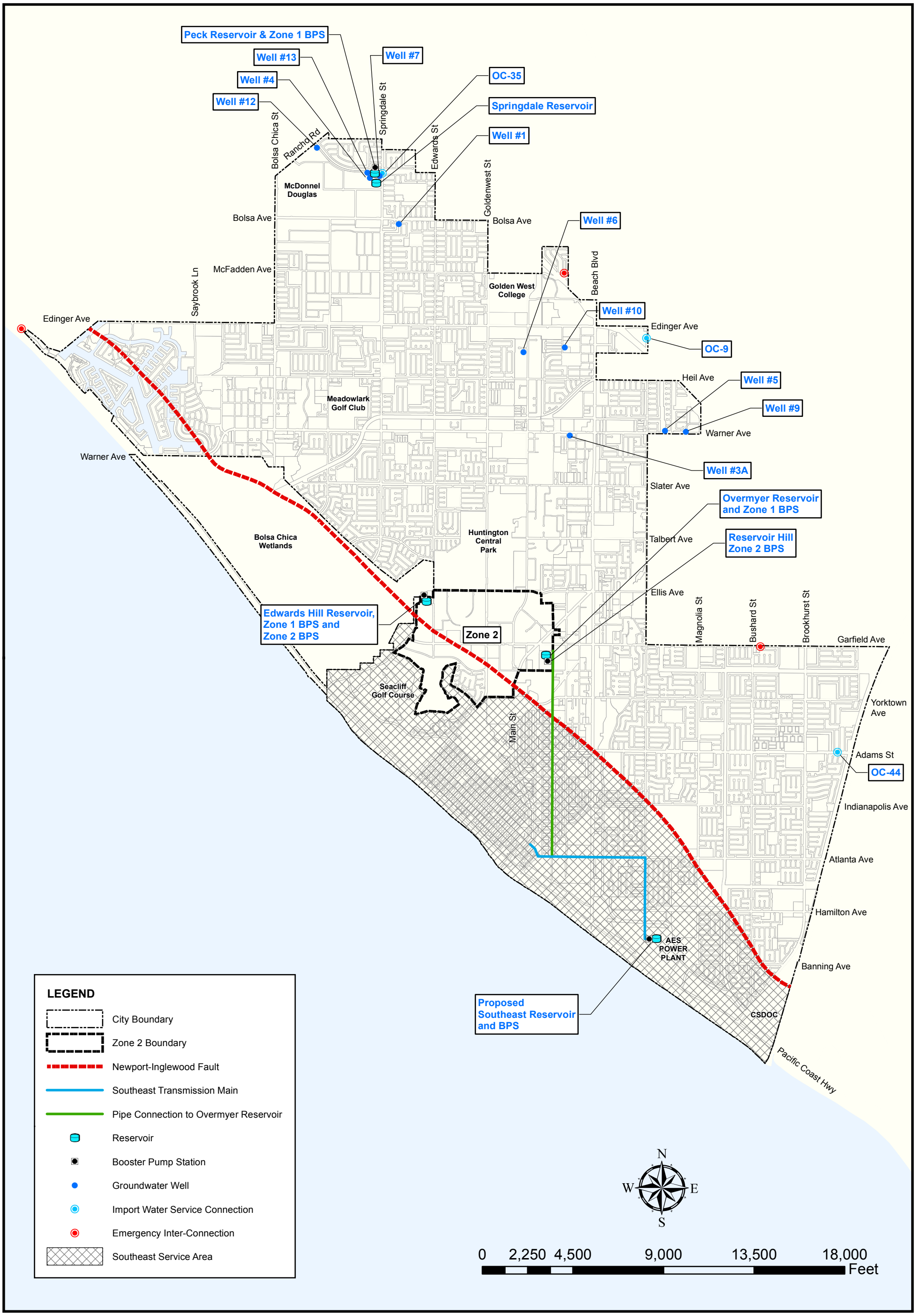
Storage is required in a water system to balance variations in demand above and below normal supply settings (operational storage), to provide water for fighting fires (fire storage), and to provide water when normal supplies are reduced or unavailable due to unusual circumstances (emergency storage).

The City currently has 55.0 million gallons (MG) of storage capacity located at the Overmyer, Peck, Springdale, and Edwards Hill storage reservoirs as shown in Table 5-1. Booster stations are located at the Overmyer, Peck/Springdale, and Edwards Hill sites to pump water from the reservoirs into the Zone 1 distribution system at appropriate pressures. The Reservoir Hill Booster Pump Station, which is located at the Overmyer site, boosts water from Zone 1 into Zone 2, which does not have the capability to directly pump from a storage reservoir. In addition to Zone 1 pumps, the Edwards Hill Booster Pump Station also houses pumps to boost water from Zone 1 into Zone 2.

Table 5-1
Existing and Proposed Reservoir Capacities

Reservoir	Location	Capacity (MG)
Existing		
Overmyer	Zone 1	20.0
Edwards Hill	Zone 1	9.0
Springdale	Zone 1	9.0
Peck	Zone 1	17.0
Subtotal Existing		55.0
Proposed		
Southeast (with 11,000 gpm booster pump station)	Zone 1	10.0
TOTAL		65.0

As shown in Figure 5-1, the Newport-Inglewood Fault runs through the City. Currently there are no sources of supply and no storage reservoirs south of the fault. Water is supplied to the south from supply sources north of the fault. An earthquake on this fault could potentially sever water transmission and distribution pipelines crossing the fault and leave the southern portion of the City without potable water.



City of Huntington Beach
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Newport-Inglewood Fault and Southeast Service Area

Figure 5-1

As recommended in the 2000 Water Master Plan, a 10 MG storage reservoir and an 11,000 gpm booster pump station is to be constructed in the southeast quadrant of the City, south of the fault. The reservoir and booster station were sized to supply demands to the area south of the fault and south of Bolsa Chica. Additionally, a 10,400 linear-foot 16-inch to 24-inch Southeast Transmission Main was also specified in the 2000 Water Master Plan to distribute water to the southeast service area and to the Downtown Loop. The proposed routing of this transmission main was north on Newland Street, then west on Atlanta Avenue to a tie-in with the 20-inch Downtown Loop at 3rd Street/Lake Street. The proposed transmission main was to be interconnected with a parallel 12-inch distribution main for the entire routing to distribute water to the southeast service area. As part of the hydraulic modeling work accomplished for this master plan update, it was determined that the original proposed diameter of the Southeast Transmission Main needs to be increased to 36-inches, and that additional piping is necessary to extend from Huntington Street/Atlanta Avenue to Overmyer Reservoir. The additional pipeline routing and increased pipe sizing were analyzed in this master plan and are discussed further in Chapter 7.

With the construction of this "Southeast Reservoir and Booster Pump Station", the City would have 65.0 MG of storage capacity as shown in Table 5-1.

However, the potential desalination project is also proposing to construct a 10 MG reservoir to store treated water prior to pumping it out to customers. If the new reservoir and pump station is constructed and connected to the City's proposed transmission main as is currently planned, then the need for a separate, City reservoir and pump station in this area would be negated. If the southeast portion of the City were to be cut off from the rest of the City system and existing storage northwest of the Fault, the new reservoir could provide water to this area during such an emergency situation. Under this scenario, the City would still need to construct the proposed Southeast Transmission Main.

The four existing reservoirs are located in Zone 1. The proposed Southeast Reservoir or the new reservoir from the potential desalination project would also be located in Zone 1. Operational, fire, and emergency storage for Zone 2 is available from the Zone 1 reservoirs.

Each of the City's reservoirs is a pumped storage reservoir that requires a booster pump station to boost water from the reservoir into the distribution system at appropriate pressure. Accordingly, the booster pump stations must be reliable. Natural-gas power is considered by some to be more reliable than electrical power. Emergency power is necessary at the booster pump stations to ensure supply from the storage reservoirs during a power outage. Emergency supply can take the place of emergency storage if the supply is available during the emergency scenario being considered. It then becomes important, whenever possible, to have emergency power or a dual source of energy at supply sites, such as the City's wells, to ensure a reliable source supply.

All of the City's supply sources, wells and imported water connections, are located in Zone 1. The Zone 1 supply sources must provide peak-hour supply to the Zone 2 Edwards Hill and Reservoir Hill booster pumps because Zone 2 does not have a direct

connection to a storage reservoir to supply operational storage. The Reservoir Hill Booster Pump Station and Edwards Hill Booster Station, together, must have sufficient pumping capacity to convey the Zone 2 peak-hour demand and the Zone 2 maximum-day demand plus fire-flow demand, and must be reliable.

5.2 Reservoir Operating Levels

Table 5-1 shows the capacities of the City's reservoirs corresponding to the reservoirs being filled to their maximum levels. However, during a normal operating day, the reservoir levels typically vary between the maximum and minimum levels in order to supply water into the system when needed. The City typically fills reservoirs at night when system demands are low, but even then not all reservoirs are full at the same time. Reservoirs supply water into the system during the day when demands exceed the total supply from wells and imported water connections. The wells and imported water connections are set such that the reservoirs are exercised during high demand hours of a day. The volume that is drained and then refilled on a daily basis is operational storage. With this in mind, a total volume of 55 MG is rarely available at any one time.

In assessing system storage, the full storage capacity of 55 MG is taken as a starting point. The operational storage needed for the maximum day demand (MDD) is then calculated. This volume is then subtracted from the 55 MG capacity to assess available storage when all reservoirs are at their lowest levels simultaneously during a normal operating day.

Fire storage necessary for fire protection is then assessed assuming that complete system operational storage has been depleted during a normal MDD (worst case). Emergency storage, which is reservoir volume necessary to satisfy system demands when normal supplies are reduced or unavailable due to unusual circumstances, is then assessed after operational and fire storage volumes have been subtracted from system reservoirs (again, worst case). This is the industry standard methodology for assessing water system storage sufficiency.

5.3 Operational Storage

As a general rule, supply sources other than reservoirs are designed to supply average day demand (ADD) up to MDD, and storage reservoirs are sized to supply the hourly demands in excess of MDD. This storage volume is termed operational storage. The reservoirs fill when demand falls below the total output from the wells and the imported water connections. Water agencies often reserve approximately 25% of MDD for operational storage.

The City is located along the Pacific Ocean, which results in a moderate to mild climate. Accordingly, high demand variations in the summer are less severe than more inland areas. As a result, the City's actual operational storage may be slightly less than 25% of MDD. However, to be conservative, 25% of MDD will be used as the operational storage requirement for the City's water system for this water master plan.

Year 2035 MDD for the City is estimated at 38,680 gpm (ADD of 21,489 gpm multiplied by a 1.80 MDD peaking factor as discussed in Section 2.3). At 25% of MDD, the operational storage requirement is 13.92 MG.

5.4 Fire Storage

Fire flow is the flow rate of a water supply that is available for firefighting from fire hydrants at a minimum residual pressure of 20 pounds per square inch (psi). City fire flow requirements are set by the City Fire Department and are based on the current Uniform Fire Code (UFC). The fire flow requirements are based on land use, construction materials, and building floor area (fire area). The UFC requirements are minimum requirements and additional fire flow and storage might be required as determined by the City's fire department.

General fire flow requirements based on general land use classifications as shown in Table 5-2 will be used to analyze fire flow pressures and storage in this water master plan. Actual fire flow requirements would be determined by the City Fire Department in accordance with the UFC. The fire flows shown in Table 5-2 could be reduced if the building in question is provided with an approved automatic sprinkler system. It should be noted that, as of January 2011, all new residential construction is required to have fire sprinklers.

Table 5-2
General Fire Flow Requirements for Water Master Plan Analysis[a]

Land Use Designations	Fire Flow (gpm)	Flow Duration (hours)
One and Two-Family (Low Density) Residential	1,000 to 2,000	2
Multi-Family (High Density) Residential, Mobile Home Park, and School	3,500	3
All Commercial (other than Regional), Hospital	5,000	5
Regional Commercial, Industrial	6,000	6

(a) The data in this table provides general City fire flow criteria to be used in this water master plan. Actual fire flow requirements would be determined by the City Fire Department in accordance with the Uniform Fire Code. As of Jan. 2011, all residential, including Low Density is required to have fire sprinklers, which should reduce flows above by up to 50% with a minimum of 500 gpm.

Because a fire can occur on any day and at any time, the adequacy of fire storage and supply was analyzed under a MDD, after operational storage had been depleted. A Zone 1 fire flow storage requirement of two simultaneous 5,000-gpm fire flows for 5 hours (3.0 MG) was used in the 2005 and previous years' City Water Master Plans and will be used as the Zone 1 requirement in this water master plan. It assumed that the two simultaneous Commercial or Mixed-Use fires would occur in the Downtown Area.

Zone 2 has some industrial land use. Accordingly, per the general fire flow requirements in Table 5-2, the maximum Zone 2 fire flow requirement is 6,000 gpm for 6 hours (2.16 MG gallons as indicated in Section 5.5.1). Because Zone 2 does not have a reservoir, this storage must be provided in Zone 1 reservoirs. The total Zone 1 fire storage requirement is then 5.16 MG. Booster pump stations utilized to satisfy fire flow requirements must be reliable with a redundant pump available for back up. For this reason, the largest pump at the Reservoir Hill Booster Pump Station was assumed out of service in analyzing the adequacy of Zone 2 fire-flow supply.

5.5 Emergency Storage/Supply

Emergency storage is the volume in reservoirs that is available to satisfy demands when normal supplies are reduced or unavailable due to unusual circumstances. For the City, normal water supply is from wells and imported water connections. An emergency reduction in normal water supplies can occur at any time and it must be assumed that emergency storage is available only after operational and fire storage have been depleted (or reserved) from the reservoirs on the MDD.

One way to gauge the magnitude of available emergency storage is to determine the equivalent number of days of average demand that can be provided. Year 2035 operational plus fire storage requirement for the City is estimated at 19.08 MG (13.92 MG operational plus 5.16 MG fire). Currently, the City has 55.0 MG of storage capacity. After the operational and fire storage have been depleted, 35.92 MG of storage is available as emergency storage. At projected 2015 demands of 29.12 MG this equates to 1.23 average days of storage. At a year 2035 average demand of 30.94 MGD, 1.16 days of emergency storage would be available. With the construction of the proposed 10.0 MG Southeast Reservoir, 1.58 days of storage would be available using projected 2015 average demands and 1.48 days of storage would be available at 2035 demands. However, this is a rather abstract barometer of emergency storage that is primarily useful for comparison with other water purveyors.

In a 2001 survey conducted by the City of Huntington Beach Department of Public Works, various water agencies in California, Washington, and Arizona were asked how much emergency storage the water agency had "if they lost their major source of supply". Emergency storage as the number of days of average demand (unless otherwise footnoted) for the various agencies contacted are shown in Table 5-3. Twenty six agencies were surveyed and 24 are listed in Table 5-3, with the high and low thrown out. The days of emergency storage calculated above puts Huntington Beach in the middle of the agencies surveyed. Note that some agencies responded with days of "peak-day"

demand or days of "emergency storage", which are footnoted in Table 5-3. It is not known if days of "emergency storage" are days of average demand or peak demand.

Table 5-3
Emergency Storage for Other Water Purveyors

Water Agency	Emergency Storage (# Days Average Demand)[a]
City of Huntington Beach[b]	
Without Southeast Reservoir (2015 demand)	1.2
With Southeast Reservoir (2015 demand)	1.6
Respondents to 2001 City of Huntington Beach Survey	
City of Phoenix	1.9
City of Tucson	2.6
City of Anaheim	0.5
City of Pomona	1.5
City of Azusa	0.6
Palmdale Water District	2.1
Seattle Public Utilities[c]	1.5
City of Sacramento[d]	0.5
City of Garden Grove[d]	1.1
City of Inglewood[d]	1.4
City of Santa Ana[d]	0.4
City of Hawthorne[d]	0.7
City of Torrance[d]	0.7
City of San Diego[d]	0.4
Otay Water District[d]	0.6
City of Sacramento[d]	2.1
From Published Water Master Plans	
Irvine Ranch Water District	1.8
Capistrano Beach Water District – 1997	0.5
City of Tustin – 2000	0.4
City of Westminster – 1999	0.3
Yucaipa Valley Water District	2.0
City of Ontario	1.0

(a) Unless otherwise footnoted

(b) Based on estimated average-day demand for 2015

(c) Days of "peak-day" demand

(d) Days of "emergency storage"

Emergency storage for other local water agencies (as days of average demand) from information published in recent water master plan reports are also included in Table 5-3.

The City of Huntington Beach is approximately in the middle for emergency storage as days of average demand relative to the other agencies listed in Table 5-3. However, the amount of emergency storage needed by a given agency is dependent on the availability of other supply sources during a specific emergency scenario. Emergency storage as days of average demand pertains to an emergency scenario where no other source of supply is expected to be available. For Huntington Beach, this translates to complete loss of both groundwater supply and imported water supply. This is a possible scenario, but highly unlikely relative to a scenario where either groundwater supply or imported water supply is lost or reduced.

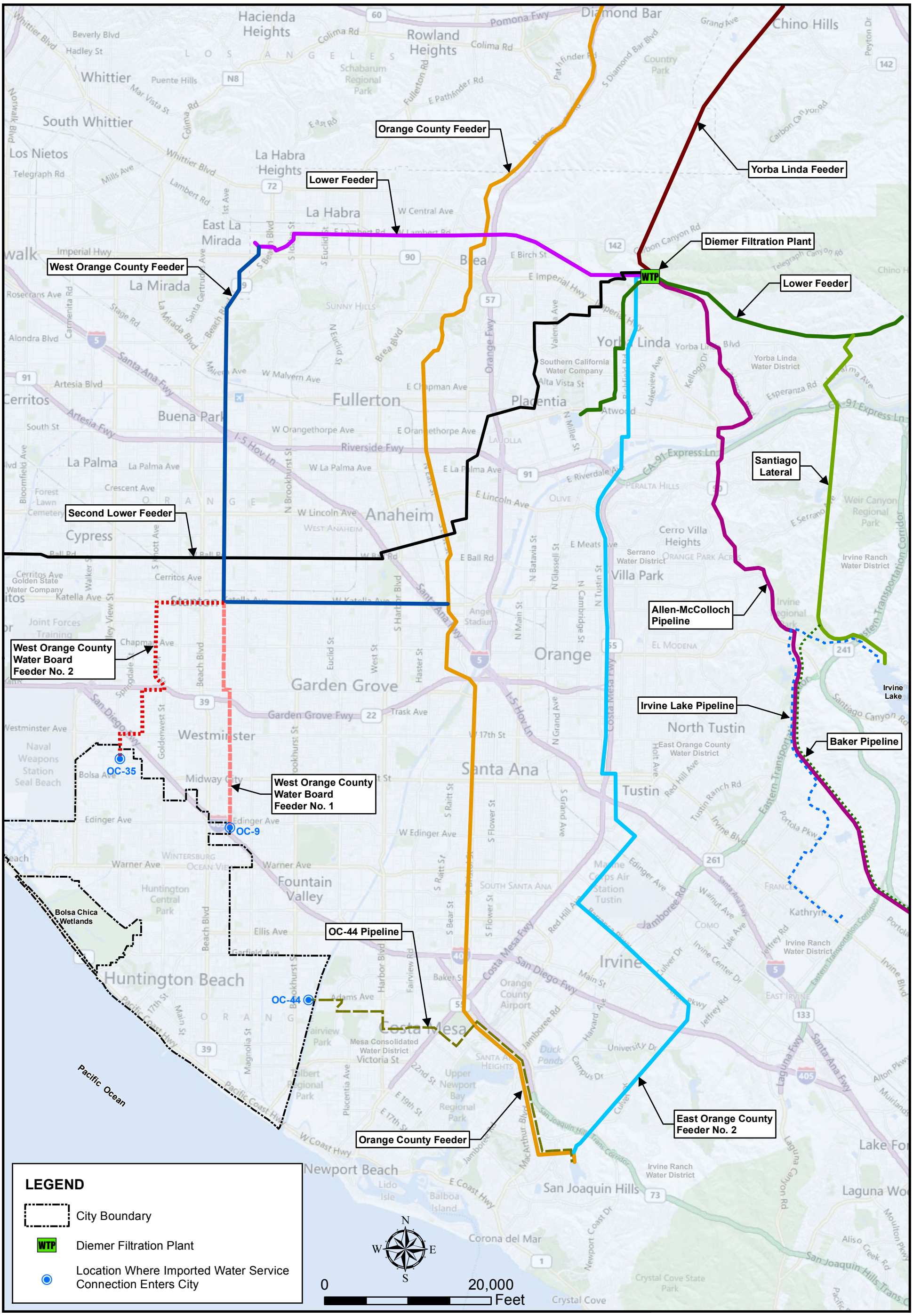
In an emergency situation where water supply is lost or reduced, the City would go to public notification to reduce water demand. A reduction in demand to 80% of average-day demand is assumed in this water master plan for the emergency scenarios evaluated. Note that the days of average demand emergency storage shown in Table 5-3 is for normal average-day demand, i.e. not reduced.

In this water master plan, five different emergency storage/supply scenarios were evaluated:

- Emergency Scenario No. 1: A complete loss of the City's imported water supply.
- Emergency Scenario No 2: A complete loss of the City's imported water supply coupled with a 7-day electric power outage.
- Emergency Scenario No 3: A complete loss of the City's groundwater supply.
- Emergency Scenario No 4: A complete loss of the City's imported water and groundwater supplies.
- Emergency Scenario No 5: A complete loss of water supply to the portions of the City south of the Newport-Inglewood fault as a consequence of an earthquake on this fault.

***Emergency Scenario No. 1**: A complete loss of the City's imported water supply*

As discussed previously, the City purchases supplemental, treated, imported water from MWDOC, which is a member agency of MWD. MWD imports raw water from northern California and the Colorado River, then treats the majority of this water to potable standards at filtration plants located in throughout Southern California. As shown on Figure 5-2, imported water is conveyed to the City via the following routes:



City of Huntington Beach
2012 Water Master Plan

Imported Water Pipeline System

Figure 5-2

1. From the Diemer Filtration Plant to the East Orange County Feeder No. 2 (EOCF2) to the OC44 Transmission Line to the OC-44 Service Connection at Adams Street and the Santa Ana River.

2. From the Diemer Filtration Plant and/or the Jensen Filtration Plant (to either the Lower Feeder or the Second Lower Feeder) to the West Orange County Feeder to:
    a. the West Orange County Water Feeder No. 1 to the OC-9 Service Connection at Newland Street and Edinger Street, and
    b. the West Orange County Water Feeder No. 2 to the OC-35 Service Connection at Springdale Street and Glenwood Street.

The City's allocated capacities in OC-9, OC35, and OC-44 are shown in Table 5-4.

Table 5-4
City Imported Water Service Connections

Connection	Allocated Capacity (gpm)	Zone Supply	Location
OC-9	6,300	Zone 1	Dale and Katella Streets (City of Stanton)
OC-35	9,000	Zone 1	Dale and Katella Streets (City of Stanton)
OC-44	6,700	Zone 1	Adams Ave. & Santa Ana River (East Orange County Feeder No. 2)
TOTAL	**22,000**		

The most likely causes for an imported water outage or reduction in supply would be a break in an imported water transmission main or mains or an outage at a filtration plant. Imported water transmission pipelines are well designed, with most of the pipelines constructed of welded steel pipe. However, the imported water transmission pipelines traverse hundreds of miles in areas with high seismic potential and this makes the imported water supply system susceptible to damage in a seismic event. Additionally, aging pipelines are subject to failure, especially metal pipes without corrosion protection systems in place. The MWD recommendation has been for water agencies to have seven days of storage/supply independent of imported water in order to have supply when MWD must take facilities down for repair or maintenance and as a safeguard against an emergency imported water outage.

The imported water pipelines (outside of the City) also operate at high pressures and a pressure surge could rupture a pipeline. In December 1999, a pressure surge on the Allen McColloch Pipeline (AMP) ruptured a section of pipe. Because the rupture occurred on a section of pipe that was easily accessible and occurred in the winter, repairs took four weeks. Otherwise, the repair could have taken much longer.

MWD's "Infrastructure Reliability and Protection Plan (IRPP)" is a program where MWD evaluates the reliability of its aqueduct facilities, treatment plants and distribution system. MWD conducted a regional evaluation of the risks to its facilities from earthquakes and categorized recovery times for four types of defined events, as summarized in Table 5-5.

In addition to the recovery times shown in Table 5-5, MWD also provided a more detailed assessment of the time required for specific facilities in Orange County. An outage of the Diemer Filtration Plant is estimated to have a recovery time of 31 days and repairs on the East Orange County Feeder No. 2 is estimated to take 10 days. For Orange County, the most significant risk to imported water supply is believed to be movement of the Whittier-Elsinore fault system.

Table 5-5
MWD IRRP-Defined Events and Recovery Times

Defined Event	Type of Failure	Recovery Time
Nominal Single Event	Single location pipe failure due to earthquake, operational occurrences, or 3rd party incidents	3 to 10 days
Recovery Plan Event	Multiple location pipe failures due to a moderate earthquake	14 to 21 days
Complex Single Event	Single location pipe failure in a difficult location with interfering utilities	21 to 31+ days
Extreme Event	Failures of treatment plants and distribution system due to seismic events that significantly exceed design criteria	1 to 6 months

The City has some protection against losing its entire imported water supply because imported water can be conveyed from the Diemer Plant to the City via several routes to OC-9 and OC-35 and a separate route to OC-44. Although concurrent breaks on several routes are possible, concurrent breaks on all of the routes is not considered likely. The City can also receive treated imported water from the Diemer Filtration Plant and the Jensen Treatment Plant via the West Orange County Feeder conveyance route, leaving the City less vulnerable to an outage at either of the two plants.

MWDOC was contacted to discuss imported water supply reliability for Huntington Beach and their position is that the City might receive all, some, or none of its normal imported water supply after a major facility outage depending on circumstances. MWDOC would act to send imported supply to where it is most needed. Most likely, the City would see at least some reduction in its normal imported water supply because of the City's strong groundwater supply relative to other areas entirely dependent on imported water. MWDOC would prioritize who most needed imported water, and conceivably the City could be asked to get by on groundwater alone if that is where the City fell on the priority list.

Under an extreme emergency in which no imported water were available, the City would have to rely on 100% groundwater supply to meet demands of 16,180 gpm and 17,190 gpm, which is the City's projected year 2015 and 2035 average-day demand, respectively, reduced by 20% through public notification. In evaluating this emergency condition, it is assumed that "normal" booster pumping capacity, i.e. capacity from duty pumps not including the largest backup pump at each site, is available at all of the booster pump stations. If a duty pump were to be out of service for repair, it is assumed that the backup pump would take its place. To be conservative, it is assumed that one well pump is out of service for repair at the time of the emergency. For this evaluation, Well No. 5 is assumed to be out of service.

As discussed previously, the City has a total potable water well capacity estimated at 22,400 gpm as shown in Table 5-6, with the assumptions footnoted. However, under the assumption that Well No. 5 is out of service, the capacity is reduced to 19,400 gpm, which is still greater than the estimated 2010 and 2035 demands under a reduced scenario. The City would also have approximately 36 to 46 MG of emergency storage available depending on whether the 10 MG Southeast or the new reservoir from the potential desalination project is on line.

Table 5-6
Well Supply under Emergency and Electrical Power Outage

Well	Estimated Operating Capacity (gpm)	Electric Motor (EM) or Natural Gas Engine (NG)	Available Capacity w/Electrical Power Outage (gpm)
Well No. 1[(a)]	350	EM	0
Well No. 3A	2,500	EM	0
Well No. 4	500	NG	500
Well No. 5	3,000	EM	0
Well No. 6	3,000	NG	3,000
Well No. 7	3,400	NG	3,400
Well No. 9	3,000	NG	3,000
Well No. 10	3,400	NG	3,400
Well No. 12[(b)]	750	EM	0
Well No. 13	2,500	NG	2,500
TOTAL (gpm)	22,400		15,800
TOTAL (mgd)	32.3		22.8

a) Existing operating capacity of 350 gpm. Could have an estimated capacity of 750 gpm if re-drilled; schedule to be determined.

(b) Completed in late 2005 at a capacity of 3,000 gpm with an electric motor and no on-site generator. Currently out of service due to water quality issues but assumed to be operated at 750 gpm during emergency conditions (non-power outage – Scenario 1)

***Emergency Scenario No 2**: A complete loss of the City's imported water supply coupled with a 7-day electrical power outage*

Under this emergency scenario, it is assumed that an earthquake would disable the imported water supply for up to 31 days and would create a 7-day electrical power outage. In this scenario it is assumed that natural gas supply is not lost at any of the booster pump stations or well sites. The City has backup propane storage/equipment at each of the booster pump sites to power natural-gas engines in the event of an outage of the normal natural-gas supply, i.e. natural gas pipelines. Well Nos. 4, 7, and 13 also can receive emergency propane supply from the 10,000-gallon LPG tank at the Peck facilities site.

In accordance with the 1995 Water Master Plan, to provide energy back-up at well sites, the City purchased a portable, trailer-mounted propane storage vessel in 2010 and constructed vaporizers at Well Site Nos. 6, 9, and 10.

As in Emergency Scenario No. 1, it is assumed that normal booster pumping capacity is available, but that Well No. 5 is out of service for repairs.

As shown in Table 5-6, Well Nos. 4, 6, 7, 9, 10, and 13 operate off of natural-gas engines and these wells would be available during an electrical power outage, whereas Well Nos. 1, 3A and 12 have electric motors and would be out of service as backup generators are not available. Well No. 5 is assumed out of service due to repairs consistent with the assumption made in Emergency Scenario 1. Therefore, the well supply would be 15,800 gpm as shown in Table 5-6.

As discussed in Chapter 4, all pumps at the booster pump stations with one exception are powered by a natural gas engine or can be powered by either an electric motor or a natural gas engine. All of these pumps would be available during an electrical power outage. The exception is the 400-gpm pump at the Zone 2 Reservoir Hill Booster Pump Station that is powered by an electric motor only and is assumed to be out of service during the electrical power outage.

The City's projected 2015 average-day demand reduced by 20% through public notification is estimated at 16,180 gpm. During an electrical power outage, available well supply is estimated to be 15,800 gpm, which results in a supply deficit of 3.8 MG for a 7-day outage. However, the City would have 35.9 MG of emergency storage available from existing reservoirs, resulting in a supply surplus of over 32 MG for the 7-day electrical power outage.

The estimated year 2035 average-day demand reduced by 20% through public notification is 17,190 gpm. During an electrical power outage, a supply deficit of 14.0 MG for the 7-day period would occur. However, the City will have 35.9 MG of emergency storage available even without considering the 10.0 MG Southeast or the new reservoir from the potential desalination project to satisfy demand during the 7 days with over 20 MG of storage to spare.

Emergency Scenario No 3: A complete loss of the City's groundwater supply

Another emergency scenario is a complete loss in the City's groundwater supply from the Orange County Groundwater Basin, conceivably as a result of basin groundwater contamination. This emergency scenario is not deemed as likely as an imported water outage. In such an emergency, other basin producers would also be affected and a larger strain would be placed on imported water supply. Again, MWD and MWDOC would prioritize imported water delivery to agencies on a most needed basis. The City may or may not receive all of its imported water supply, which is 22,000 gpm as shown in Table 5-4. The maximum allocation of 22,000 gpm is more than sufficient to meet demands of 16,180 gpm and 17,190 gpm, which is the City's 2010 and year 2035 average-day demand, respectively, reduced by 20% through public notification. The City would also have approximately 36 to 46 MG of emergency storage available depending on whether the 10 MG Southeast or the new reservoir from the potential desalination project is on line. The existing emergency storage alone is equivalent to an 831-gpm supply for 30 days for the existing system and a 1,063-gpm supply for 30 days for the year 2035 system, assuming the additional 10 MG reservoir is on line by then.

Emergency Scenario No 4: A complete loss of both the City's imported water and groundwater supplies

A scenario where the City completely lost both its groundwater supply and its imported water supply is considered extremely unlikely. This would be the scenario where the total emergency supply for the City would need to come from emergency reservoir storage because it is assumed that neighboring cities would also be affected by such an extreme water supply emergency and that supply from emergency connections with other cities would not be available. Available emergency storage is equivalent to 1.23 days of operation for the projected 2015 water system demands and 1.16 days of operation for the 2035 system demands, assuming no additional storage is constructed; and 1.49 days assuming the 10 MG Southeast or the new reservoir from the potential desalination project is on line by then.

However, under such an extreme outage scenario, the City would go to immediate public notification and demand would be reduced well below average demand. Because of the severe condition, it could be assumed that water demand would be reduced to 40% of average. A 40% reduction results in emergency storage equivalent to 2.05 days of operation for the projected 2015 water system demand and 1.93 days of operation for the 2035 system demands, assuming no additional storage is constructed; and 2.47 days assuming the additional 10 MG reservoir is on line by then.

Emergency Scenario No 5: A complete loss of water supply to the portions of the City south of the Newport-Inglewood fault as a consequence of an earthquake on this fault

Pumped storage in the southern part of the City, south of the Newport-Inglewood fault, was recommended in both the 2000 and 2005 Water Master Plans and is recommended in this water master plan update based on the findings in the 1999 City of Huntington Beach Infrastructure Restoration Study (Special Study Report on the Water and Drainage System Infrastructure) prepared by the U.S. Army Corp (1999 Army Corps Study).

Currently, there are no sources of supply and no storage reservoirs in the City south of the fault. The 1999 Army Corps Study concluded that water transmission supply pipelines crossing the fault would be ruptured by a design-basis earthquake on this fault, leaving the area south of the fault without a water supply. The study anticipated that a portion of the major water mains crossing the fault could be repaired after the earthquake to provide partial service to the southern areas isolated by the fault.

The City has purchased property at the AES generating plant site as the location for the Southeast Reservoir and Booster Pump Station. When this reservoir or the new reservoir and adjacent booster station from the potential desalination project is constructed, along with the Southeast Transmission Main, they would provide fire plus emergency storage for the area south of the fault and east of Bolsa Chica. These projects are recommended to remain for inclusion in the City's Water CIP as discussed in Chapter 7.

5.5.1 Pressure Zone 2

The 2035 maximum day demand projected for Zone 2 is 2,390 gpm (3.44 MGD) using a 2.7 MDD factor as discussed in Section 2.3. At 25% of the maximum day demand, the operational storage requirement for Zone 2 is 0.86 MG. A 6,000-gpm fire flow for five hours is the Zone 2 fire flow requirement because of industrial land use in Zone 2. This equates to a fire storage requirement of 2.16 MG. The combined Zone 2 fire and operational storage requirement of 3.02 MG is well within the overall system requirement of 19.08 MG as described previously in Section 5.5.

The Reservoir Hill Booster Pump Station has a Zone 2 pumping capacity of 6,060 gpm with the largest pump (3,500 gpm) out of service. The Edwards Hill Booster Pump Station has a pumping capacity of 3,750 gpm with all three Zone 2 pumps in operation. The combined Zone 2 pumping capacity of 9,810 gpm is sufficient to supply the MDD plus fire flow requirement of 8,390 gpm (2,390 + 6,000).

The Reservoir Hill booster pumps with the exception of Pump No. 1 are powered by natural gas engines and the Edwards Hill booster pumps can be powered by either an electric motor or a natural gas engine. All of these pumps would be available during an electrical power outage. The exception is the 400-gpm Pump No. 1 at the Reservoir Hill Booster Pump Station that is powered by an electric motor only and is the only pump that would be out of service during an electrical power outage.

A 1,500-gallon LPG tank and associated equipment are located at the Edwards Hill site to provide backup propane gas supply for operation of the engine-driven pumps. Two 3,900-gallon LPG tanks and associated equipment are located at the Overmyer/Reservoir Hill site to provide backup propane gas supply for operation of the Reservoir Hill booster pumps as well as the Overmyer booster pumps.

5.6 Storage/Supply Adequacy for Emergency Operating Conditions

The City has sufficient reservoir storage to satisfy City operational plus fire storage requirements through the planning period ending in the year 2035. As scheduled in the City's current Water CIP, a 10-MG storage reservoir and an 11,000-gpm booster pump station will be constructed in the southeast quadrant of the City to ensure supply reliability and storage for the area south of the Newport Inglewood Fault and south of Bolsa Chica.

The City has sufficient emergency storage, groundwater supply, imported water supply, and emergency power to withstand a number of emergency supply outage scenarios evaluated in this Chapter.

In accordance with the 1995 Water Master Plan to provide energy back-up at well sites, the City purchased a portable, trailer-mounted 500 gallon propane storage vessel in 2010 and constructed vaporizers at Well Site Nos. 6, 9, and 10.

6 HYDRAULIC MODEL CONSTRUCTION, MODEL VALIDATION & SCENARIO MODELING

6.1 Hydraulic Model Description

The hydraulic model used for this master plan was provided by City staff at the outset of the project. The model is in WaterCAD format and is compatible with Water GEMS modeling software by Bentley Systems. The model is used routinely by City staff and contains numerous scenarios. It contains all pipes, wells, reservoirs, imported water connections, and booster stations in the existing water distribution system, and several demand allocations including those representing existing and estimated future demand conditions for average day, maximum day and peak hour demands.

6.2 Model Validation

Existing demands were first revised to correspond to the reduced demands experienced over the past few years as described in Chapter 2, which are also consistent with the 2010 UWMP, as discussed in Chapter 2. Then a series of validation analyses were conducted to verify that the model adequately simulated observed operating conditions within the distribution system. An existing demand condition was selected for the validation analyses after review of the model and discussion with City staff. The validation analyses were run under various existing demand conditions. The results were reviewed with City staff, and it was determined that the existing model provided accurate results for use on this project. The review determined that the existing piping system was sufficiently accurate and the existing demand allocation was suitable for analyses for this Water Master Plan.

The WaterCAD model simulates pump station flows and pressures into the system using reservoirs set to an overflow elevation equal to the hydraulic gradient in the system. Refill rates to the water storage facilities are simulated with control valves and a separate reservoir to receive the refill water. Imported supplies from the three turnouts and from City wells are simulated as input flow to the system (negative demand) equal to the reported typical yield of each well and turnout. In cases where a well or turnout is not operating, input flows are set to zero.

Hydraulic analyses conducted for this project used the existing system model to create a series of extended period simulation (EPS) analyses that represent demands experienced over a typical week in June 2007. These demand curves were then uniformly increased to reflect conditions that could be expected during a week of maximum demand. Hydraulic analyses were conducted under existing and future year 2035 demand conditions. In recent years, due to aggressive water conservation and water allocation, demands have been down as shown in Table 2-2. Therefore, existing demands were derived from the average demand from 2005/06 to 2007/08, prior to any water allocations to reflect existing normal year water demand, consistent with the City's 2010 UWMP. Details on the hydraulic analyses methodology and results are provided as technical memorandums in the appendices of this master plan report with summaries provided below.

6.3 Distribution System Modeling

Various scenarios were set up by varying demand conditions and modeled to analyze the transmission and distribution system to determine system responses and develop recommended capital improvements. These scenarios are summarized in the following sections and described in the technical memorandums in the appendices.

6.3.1 Maximum Week Condition

6.3.1.1 Existing Demands

Demand data for a typical week in June of 2007 was provided by City staff, including diurnal curves for the entire week. These typical daily demands were factored up to represent a typical week during the maximum week.

Capital projects included in the previous master plans that remain to be completed will be discussed in detail in Chapter 7, and were analyzed to determine/confirm proper sizing and location.

6.3.1.2 Future (2035) Demands

The future, 2035 demand projections (sometimes referred to as Build-out in this master plan) were described previously in Chapter 2. The additional demands over and above existing demands come primarily from two major specific plan areas, the Beach-Edinger Corridors Area and the Downtown Area, as discussed in Chapter 2. Therefore, projected additional demands are placed on nodes within the water distribution system in accordance with the location where they are anticipated to occur as described in the Build-out Demands & Distribution of Demands dated February 14, 2012 (Appendix B).

Similar to the existing system hydraulic modeling discussed above, the future demands projected for 2035, were placed on the hydraulic model and week-long EPS runs were analyzed for average and maximum day conditions.

Under these Build-out system hydraulic analyses, the water transmission and distribution system, including all of the remaining master plan improvement projects discussed in Section 7.3, performed very well. There are capital improvement concepts analyzed that can help meet build-out maximum day demands totaling almost 38,700 gpm.

It should, however, be pointed out that the Well Study recommended in this master plan could also have an impact on the potential build-out improvements. However, if average demands do not reach these levels due to continued water conservation, then these improvements could be reduced in size and scope.

7 CAPITAL IMPROVEMENT PROGRAM

7.1 Overview

The 1995 Huntington Beach City Council adopted a water master plan and financing plan to pay for water system project improvements identified in that master plan as well as projects remaining from the 1988 Water Master Plan. The1995 financing plan adopted a pay-as-you-go (cash) basis to fund master plan projects. The water master plan capital improvement program was last updated through the 2005 Water Master Plan and this plan updates those capital projects based on current and projected system demands, more refined modeling techniques, the status of the original recommended capital improvement program, and updated cost information.

7.2 Remaining Water Master Plan Capital Improvement Projects

Water master plan projects that remain to be constructed from the 2005 Water Master Plan and Financing Plan to be funded from the water master plan project funds are described below and are identified with project numbering consistent with the previous 1995, 2000, and 2005 water master plans and financing plans. Projects for which money has been encumbered prior to May 30, 2012 are not included as a remaining master plan project and those encumbered funds are therefore not included as available.

Project No. 1: Beach Boulevard Pipe Improvements

For Project No. 1, dead end pipe segments are to be connected in locations along Beach Boulevard to improve water supply and fire flow reliability to adjacent areas fronting this thoroughfare. Dead end segments will be connected on the east side of Beach Boulevard from the flood control channel (OCFCD C-6) to Blaylock Drive, a total length of approximately 1,400 linear feet of 12-inch pipeline. Two connections of existing parallel lines running along the east and west sides of Beach Boulevard will also be made near Blaylock Drive and near Holt Avenue. Both of these relatively short connecting pipes will likely involve pipe jacking across Beach Boulevard.

Project No. 9: Pipeline Corrosion Protection Stage II

For Project No. 9 (Pipeline Corrosion Control – Stage II), corrosion control will be constructed for the 36-inch OC-35 Transmission Main on Springdale Avenue from Glenwood Drive (just outside of Peck and Springdale Reservoirs) to Warner Avenue. Design of this project has been completed, with construction expected to begin in late 2012.

Project No. 12: Permanent Wellhead Facilities for Well No. 13

Well No. 13, a fairly new well, has been operating with temporary facilities. Building a permanent well head enclosure will utilize the existing casing but will include a larger building, new mechanical equipment, improved controls, along with electrical equipment to allow this pump to operate as a hybrid, using electricity as well as natural gas.

Project No. 13: Southeast Reservoir and Booster Pump Station

As discussed previously, a 10 million gallon storage reservoir and an 11,000 gpm booster pump station was recommended in the 2005 Water Master Plan in order to increase reliability to this area in the event of a major earthquake along the Newport-Inglewood Fault. As a part of the proposed desalination plant plan, the project includes construction of a storage reservoir and a booster pump station that would eliminate the need for the City to construct these facilities. These new facilities would be available to this area in the event of such an emergency situation.

Project No. 14: Southeast Reservoir Transmission Main

A 10,400 linear foot, 36-inch distribution/transmission main will be constructed from the potential desalination booster station or City Southeast Reservoir Booster Pump Station to transmit water to the Downtown Loop. This new line will be interconnected with existing distribution lines along its route to distribute water to the southeast service area. The proposed routing from the Booster Station is north on Newland Street, then west on Atlanta Avenue to a tie-in with the 20-inch Downtown Loop at 3rd Street/Lake Street. This segment was undersized in the 2005 Water Master Plan at 16- to 24-inches and needs to be 36-inches in diameter.

Project No. 14A: Southeast Reservoir Transmission Main Extension to Overmyer

Modeling conducted with this current master plan also determined that an additional water transmission pipeline is needed to connect the Southeast Transmission Main to Overmyer Reservoir to handle day-to-day operations and to maintain water quality throughout the system. This additional transmission pipeline should have been included with the previous master plan and will be included as part of this current list of updated master plan projects.

The project involves a 1.5 mile, 36-inch and 0.25 mile 42-inch pipeline extension from the Southeast Reservoir Transmission Main at Atlanta Avenue up Huntington Street to Overmyer Reservoir. Additionally, two pressure regulating stations are needed for the two interconnects to the smaller diameter distribution system pipelines near the proposed Southeast Reservoir site and at the tie-in to the 20-inch Downtown Loop.

This project would, of course, only be constructed in conjunction with or following the construction of the Southeast Reservoir Transmission Main, Project No. 14, above. This new, 1.75 mile transmission main could be operated under system pressure to move water from Overmyer Reservoir to maintain levels in the Southeast Reservoir. Along with the Southeast Booster Station, it could also be operated to back-up Overmyer Reservoir if the reservoir needs to be taken down for maintenance. In the event desalinated water becomes available, this line could operate either (1) under system pressure; or (2) under low pressure as a dedicated fill line to Overmyer Reservoir.

Project No. 16: Fire Protection Improvements

To improve fire flow pressures and supply reliability at Peters Landing in Huntington Harbor, a 12-inch main will be constructed on 24th Street, from South Pacific Avenue to tie into the 12-inch pipeline in Pacific Coast Highway (approximately 400 linear feet).

To improve fire flow pressures and supply reliability at the high density residential area located east of Beach boulevard and south of Atlanta Avenue, an 8-inch water main will be constructed to connect the 6-inch main in Attleboro Circle to the new development known as Pacific Shores to the south. Design has been completed on this approximate 300-foot length of pipeline, with construction expected to be complete by summer of 2013.

Project No. 17: Cast Iron Main Replacement Program

The majority of the cast iron mains within the City Downtown area have been replaced but approximately 2,000 linear feet remain to be replaced with new mains made of non-corrosive pipe materials.

Project No. NA: Well No. 1 Re-drill

This project was included in the 1995 Water Master Plan to increase its capacity to around 750 gpm and since it is likely, following the results of the Groundwater Well Feasibility Study recommended in Chapter 3 (Section 3.3.9), that additional well capacity will be needed in the future, this project is included herein.

The estimated costs for the remaining capital projects described above, in January 2012 dollars, are summarized along with their year of anticipated design and construction on Table 7-1. Projects already complete or with funds encumbered prior to May 2012 are not listed.

Table 7-1
Estimated Costs for Remaining Water Master Plan Projects

Project # from 2005 WMP	Project Name	Estimated Design FY	Estimated Design Cost[a,b]	Estimated Construct. FY	Estimated Construction Cost[a,c]	Total Estimated Cost
1	Beach Blvd. Pipeline Imps.[d]	NA	$ -	2013	$ 700,000	$ 700,000
9	Pipeline Corrosion - II[d]	NA	$ -	2013	$ 1,200,000	$ 1,200,000
12	Well 13 Permanent Wellhead	2015	$ 200,000	2016	$ 1,800,000	$ 2,000,000
13	Southeast Res. & Booster PS	2018	$1,597,000	2019-20	$ 17,648,000	$19,245,000
14	Southeast Res. Trans. Main	2018	$ 503,000	2019-20	$ 5,355,000	$ 5,858,000
14A	New Connection - Overmyer to SE TM	2018	$ 540,900	2019-20	$ 5,409,000	$ 5,949,900
	1.75 mi. 36" to 42" in Huntngtn. St.		*$ 500,300*		*$ 5,003,000*	
	Interconnects @ Overmyer Res.		*$ 25,600*		*$ 256,000*	
	PRVs @ SE Res. & Atlanta/Dwntn Lp		*$ 15,000*		*$ 150,000*	
16	Fire Protection Improvements[d]	NA	$ -	2014	$ 300,000	$ 300,000
17	Cast Iron Main Replacement	2013	$ 200,000	2014	$ 800,000	$ 1,000,000
NA	Well 1 Re-drill	2016	$ 150,000	2017	$ 1,350,000	$ 1,500,000
	Total		**$3,190,900**		**$ 34,562,000**	**$37,752,900**

a) Costs estimates as of January 2012 (LA ENR = 10092). Escalation of design and construction costs will be accounted for in Financial Plan chapter. Project 14A was not included in 2005 Master Plan and total cost includes subtotals in italics.

b) Design Costs range from 5 to 15% of construction costs (except for Project 17 due to extensive potholing), depending on project size and complexity and include preliminary design, final design, potholing, geotechnical, survey, and bidding services.

c) Construction Costs include construction management and City project management. Construction management costs range from 2.5 to 5% of construction costs for shop drawings, RFIs, field visits, etc., but do not include inspection services. City project management costs range from 5 to 9% of construction costs and may include inspection services depending on the project type.

d) Design already complete or costs encumbered.

7.3 Recommendations for Additional Studies

Section 3.3.9 of this Water Master Plan recommends a future extensive well study to assess the condition of each of the City's existing wells, determine their remaining useful life, and develop a systematic approach to replacement of wells in their same general location and/or the addition of new wells at future locations. Because the potential desalination project would include construction of a storage reservoir and booster pump station, future projects, including those that may arise from the future studies, could be funded from the savings generated from deleting these two major projects from the City's Water Master Plan projects (or from savings on any of the other remaining Water Master Plan projects above).

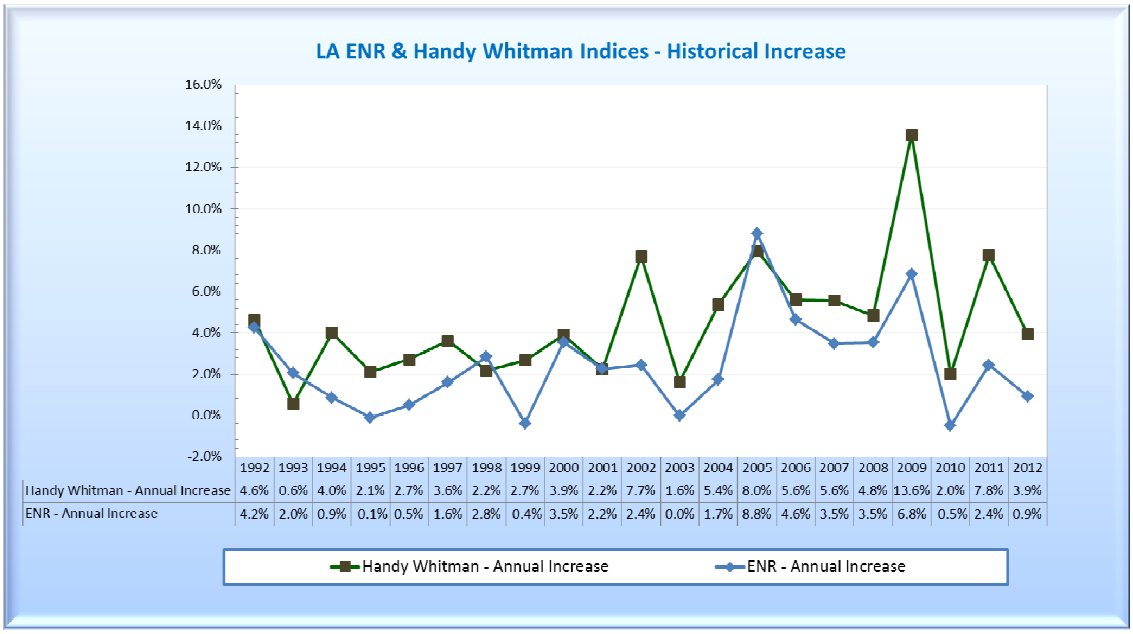
8 FINANCIAL PLAN

8.1 Capital Improvement Program Scenarios

The City is currently weighing two different CIP scenario options; one with the Southeast Reservoir and Booster Pump Station (Southeast Reservoir) expense and one without the expense. As discussed in Section 7, the scenario without the Southeast Reservoir expense would involve the Southeast Reservoir projects being constructed by a third party unrelated to the City. The financial implications on the City vary significantly depending on the CIP scenario selected. Tables 8-1 and 8-2 on the following pages show the two CIP scenarios. The first total in each table shows the total project cost for all Master Plan projects in current dollars while the second total (bottom line) shows total project costs inflated by 3.5% to account for rising construction costs.

The 3.5% capital inflation factor (compounded) used in the model was selected as a realistic long term estimate after analyzing both the Engineering News Record Construction Cost Index (ENR) and the Handy Whitman Utility Index – Pacific Region (Handy Whitman). The ENR index tracks the average construction cost for 20 different cities across the country and includes labor as part of the equation. The historical ENR data for Los Angeles was analyzed as it is the most representative of local southern California construction conditions. The Handy Whitman index contains an index of various construction costs specifically related to water utilities such as mains, treatment plant equipment, etc. (excluding labor). Figure 8-1 below shows the historical values for both the ENR and Handy Whitman Indices for the past 20 years.

Figure 8-1
20-Year Historical Increases in ENR & Handy Williams Indices



As illustrated on Figure 8-1, the actual annual variations range from as low as 0.5% decrease to as high as an 8.8 % increase in the LA ENR index and from 0.6% to 13.6% increases in the Handy Whitman index. The previous 20 year increase for the ENR index is 2.3% (compounded) while the Handy Whitman index shows a 4.5% increase (compounded). A realistic long term capital inflation rate of 3.5% is used in the model as a result of the average of the LA ENR Index and the Handy Whitman index. Over the past five years from 2007 to 2012 the increase in the Handy Whitman index was 6.4% (compounded). However, over this same period the LA ENR index only increased 2.6% (compounded), which is just higher than the 20-year LA ENR increase.

Table 8-2 following Table 8-1 displays the alternative CIP scenario with the Southeast Reservoir related expenses being funded by others instead of the City.

The two CIP programs remain the same from FY 2013 to FY 2017; the difference occurs in FY 2018 to FY 2020 where the City will not have the added expense of funding the Southeast Reservoir related expenditures as those facilities would be constructed by others. Under both scenarios, the Southeast Reservoir and Booster Pump Station are planned to be constructed, with the only difference being which entity funds them.

Table 8-1
Capital Improvement Program with Southeast Reservoir Expense

Project # from 2005 WMP	Project Name	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
1	Beach Blvd. Pipeline Imps.	$700,000							
9	Pipeline Corrosion - II	$1,200,000							
12	Well 13 Permanent Wellhead			$200,000	$1,800,000				
13	Southeast Res. & Booster PS						$3,849,000	$11,547,000	$3,849,000
14	Southeast Res. Trans. Main						$1,171,600	$3,514,800	$1,171,600
16	Fire Protection Improvements		$300,000						
17	Cast Iron Main Replacement	$200,000	$800,000						
NA	Well 1 Re-drill				$150,000	$1,350,000			
14A	New Connection from Overmyer						$1,189,980	$3,569,940	$1,189,980
	Total (In Current Dollars)	**$2,100,000**	**$1,100,000**	**$200,000**	**$1,950,000**	**$1,350,000**	**$6,210,580**	**$18,631,740**	**$6,210,580**
	Total (Inflated)	**$2,100,000**	**$1,138,500**	**$214,245**	**$2,162,000**	**$1,549,156**	**$7,376,221**	**$22,903,166**	**$7,901,592**

Table 8-2
Capital Improvement Program without Southeast Reservoir Expense

Project # from 2005 WMP	Project Name	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
1	Beach Blvd. Pipeline Imps.	$700,000							
9	Pipeline Corrosion - II	$1,200,000							
12	Well 13 Permanent Wellhead			$200,000	$1,800,000				
13	Southeast Res. & Booster PS								
14	Southeast Res. Trans. Main						$1,171,600	$3,514,800	$1,171,600
16	Fire Protection Improvements		$300,000						
17	Cast Iron Main Replacement	$200,000	$800,000						
NA	Well 1 Re-drill				$150,000	$1,350,000			
14A	New Connection from Overmyer						$1,189,980	$3,569,940	$1,189,980
	Total (In Current Dollars)	**$2,100,000**	**$1,100,000**	**$200,000**	**$1,950,000**	**$1,350,000**	**$2,361,580**	**$7,084,740**	**$2,361,580**
	Total (Inflated)	**$2,100,000**	**$1,138,500**	**$214,245**	**$2,162,000**	**$1,549,156**	**$2,804,816**	**$8,708,954**	**$3,004,589**

8.2 Pro Forma

The City's estimated 2013 beginning balance is the starting point for the Pro Forma, which is based on budgeted revenues and expenditures. There are two revenue sources for the Water Master Plan Fund. These revenue sources include revenues from the Capital Facilities Charge, which is a charge levied on newly constructed connections for connecting to the City's water system. This charge increases each year based on the annual population growth rate obtained from the City's 2010 UWMP. The Capital Facilities Charges account for about $200,000 in revenue annually. The other revenue source for the Water Master Plan Fund is from interest income, which is based on the balance of the Water Master Plan Fund. Interest income varies based on the total balance of the Water Master Plan Fund but is projected to be around $300,000 annually. The CIP related to the Water Master Plan Fund is the only obligation of the Water Master Plan Fund. After determining the net revenue by adding up all the revenues and subtracting the CIP expenditures and accounting for transfers, the ending balance for the Water Master Plan Fund is then determined. Table 8-3 at the end of this section illustrates the financial impact of the CIP scenario with the Southeast Reservoir expense.

As we can see from the Pro Forma in Table 8-3, major CIP expenses are incurred in FY 2018 through FY 2020 with a large $25 million expenditure occurring in FY 2019. Although there are not enough funds in the Water Master Plan Fund to completely fund the CIP under this scenario, based on our financial forecast of the Water Fund there should be sufficient funds to cover this expenditure.

In order to create the financial forecast a working Financial Plan Model was developed for the City. Raftelis Financial Consultants (RFC) collaborated with the City to create a functioning Financial Plan Model in Microsoft Excel™ 2007. In order to develop the model, RFC compiled both current and historical data from the City. This information included the total number of accounts, water usage records, operating budgets and the City's Capital Improvement Program. In addition, as part of the financial planning process, RFC utilized the collected data to develop projections for accounts, revenues, and revenue requirements. These projections are based on assumptions that include the population growth of the City from the UWMP. Two face-to-face meetings and a web-based meeting with Psomas and City staff were conducted to verify and refine the various assumptions and scenarios used in the model. Using these projections on the revenues and revenue requirements, the model is able to project the ending balances for the Water Fund and the Water Master Plan Fund.

The two CIP scenarios were also taken into account in the Financial Plan Model; each scenario results in a different financial position for the City. As mentioned previously, there are a significant amount of CIP expenditures in FY 2018 through FY 2020. Using the Financial Plan Model, it is projected that there will be available funds in the Water Fund to cover the shortfall in the Water Master Plan Fund during the study period. Fund transfers from the Water Fund to the Water Master Plan Fund are necessary in FY 2019

and FY 2020, totaling approximately $13.4 million because total expenditures for the Water Master Plan Fund under this scenario are larger than the projected beginning balance. These transfers ensure the CIP projects are funded and that the Water Master Plan Fund balances remain healthy. The ending balance of $0 at the end of the study period is appropriate because all of the CIP projects will be complete, and the Water Master Plan Fund can be closed out.

Table 8-4 shown following Table 8-3, illustrates the financial position of the Water Master Plan Fund under the CIP scenario where the City does not fund the Southeast Reservoir. Under this scenario, the CIP expenditures in FY 2018 to FY 2020 are significantly lower than the scenario with the Southeast Reservoir expense. The reserves remain healthy, and the City will not need any transfers from the Water Fund to maintain a positive fund balance. The City could opt to transfer the remaining funds, totaling approximately $10.5 million from the Water Master Plan Fund to the Water Fund, which will require a revision to City's existing ordinance to address the transfer of any excess in the Water Master Plan Fund to the Water Fund.

The Financial Plan Model covers a period of eight years (FY 2013 through FY 2020). Since the time frame is relatively long, many assumptions in the model such as actual construction costs, inflation factors, and growth rates may be different, especially in the later years, than what is in the model. The City has two different CIP scenarios that may significantly affect the Water Master Plan Fund balance. Because one of the CIP scenarios involves a third party funding the Southeast Reservoir expense, the City currently has no way of knowing which scenario will occur. In addition, as Tables 8-1 and 8-2 show, both scenarios have the same level of CIP expenditure for the first five years, which the Water Master Plan Fund is able to fund. Taking all this into account, it is our recommendation that the City update the Water Master Plan and Financial Plan in about 2016 and then re-visit any rate adjustments, as the City will have a better idea of which CIP scenario will be in effect and what the remaining capital obligations are at that time.

Table 8-3
Water Master Plan Fund Pro Forma with Southeast Reservoir Expense

	FY 2013 Projected	FY 2014 Projected	FY 2015 Projected	FY 2016 Projected	FY 2017 Projected	FY 2018 Projected	FY 2019 Projected	FY 2020 Projected
Beginning Balance	**$28,148,928**	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$16,789,376**	**$0**
Capital Facilities Charges	$200,735	$201,472	$202,213	$203,328	$204,450	$205,578	$206,713	$207,853
CIP Expenditure	($2,100,000)	($1,138,500)	($214,245)	($2,162,000)	($1,549,156)	($7,376,221)	($22,903,166)	($7,901,592)
Interest Income	$355,337	$335,921	$328,365	$332,351	$311,901	$298,917	$212,487	$0
Transfer from (to) the Water Fund	$0	$0	$0	$0	$0	$0	$5,694,590	$7,693,739
Ending Balance	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$16,789,376**	**$0**	**$0**

Table 8-4
Water Master Plan Fund Pro Forma without Southeast Reservoir Expense

	FY 2013 Projected	FY 2014 Projected	FY 2015 Projected	FY 2016 Projected	FY 2017 Projected	FY 2018 Projected	FY 2019 Projected	FY 2020 Projected
Beginning Balance	**$28,148,928**	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$21,360,781**	**$13,128,528**
Capital Facilities Charges	$200,735	$201,472	$202,213	$203,328	$204,450	$205,578	$206,713	$207,853
CIP Expenditure	($2,100,000)	($1,138,500)	($214,245)	($2,162,000)	($1,549,156)	($2,804,816)	($8,708,954)	($3,004,589)
Interest Income	$355,337	$335,921	$328,365	$332,351	$311,901	$298,917	$269,989	$166,446
Transfer from (to) the Water Fund	$0	$0	$0	$0	$0	$0	$0	($10,498,237)
Ending Balance	**$26,605,000**	**$26,003,894**	**$26,320,227**	**$24,693,906**	**$23,661,101**	**$21,360,781**	**$13,128,528**	**$0**

APPENDIX A

Existing and Projected Water Demand Technical Memorandum

TECHNICAL MEMORANDUM

To: Duncan Lee

From: Mike Swan

Date: May 11, 2011

Subject: Existing and Projected Water Demands for 2011 Water Master Plan

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Water demand projections were developed for the City's 2010 Urban Water Management Plan (UWMP) through a detailed procedure and for consistency will be utilized for the 2011 Water Master Plan as well. The purpose of this Technical Memorandum is to document the process used to develop these demands. Water demand production records were compiled for the past fifteen years for the purpose of determining the City's baseline per capita consumption for the 20x2020 water conservation goals. Table 1 below contains the production data straight from the 20x2020 Technical Memorandum included in the 2010 UWMP appendices.

Table 1

City of Huntington Beach Historical Water Use

Fiscal Year	Groundwater Pumped (AFY)	Imported Water (AFY)	Agri-cultural Use (AFY)	Total Water Use (AFY)
1996	26,370	8,729	23	35,122
1997	26,106	10,181		36,287
1998	20,003	13,877		33,880
1999	19,590	16,565		36,155
2000	20,144	15,254		35,398
2001	18,254	16,756		35,010
2002	24,581	10,420		35,001
2003	14,131	19,378		33,509
2004	13,188	21,084		34,272
2005	14,945	17,892		32,837
2006	19,543	12,369		31,912
2007	21,795	11,536		33,331
2008	25,573	6,285		31,858
2009	21,857	9,773		31,630
2010	18,271	11,197		29,468

Average Normal Year Water Use (2006-2008) 32,367

We will use the same rationale for determining the average or normal year existing demand as used in the 2010 UWMP. Since 1996, no separate agricultural water has been purchased by the City. It should be noted that this data is for the fiscal year period starting July 1 and ending June 30 of each year not the City's fiscal year as this data comes from Municipal Water District of Orange County and Orange County Water District who both use those fiscal year periods. Another fact to note is these projections include the water used in the Sunset Beach community, which is a part of the City of Huntington Beach water service area.

As illustrated in Table 1, total water use in the City has been trending downward even as population has increased. This is due primarily to the City's strong conservation efforts. However, the past two years have been water allocation years due to the prolonged drought in Southern California and demand have dropped drastically, especially in 2010. In order to be conservative in our demand projections, we have averaged the demands for FY 2006 through 2008, the three years prior to any drought allocation to determine what the demand would be if 2010 were a normal water year. This calculation results in an average water demand of 32,367 acre-feet per year (AFY) as shown at the bottom of Table 1, which converts to 28.90 million gallons per day (MGD) or 20,069 gallons per minute (gpm).

Development and population projections were used to generate demand projections into the future in the 2010 UWMP. This data was from the draft 2010 Orange County Projections (OCP) assembled by the Center for Demographic Research at California State University Fullerton as obtained from Mr. Ricky Ramos of the City's Planning Department. This data was updated to include some additional development statistics not included in the OCP developed by Mr. Ramos. A copy of the subject OCP spreadsheet which is too large to print herein is on file at the City. A summary of the land uses and demand projections is included as Table 2. It should be noted that the development statistics and population for the Downtown and Beach-Edinger Corridor Specific Plan Areas was projected separately but the population projections for the remainder of the City are strictly out of the draft 2010 OCP. Specifically there is an anomaly in 2035 that shows the population of the City dropping even as additional dwelling units come on line but this is apparently due to changes in demographics programmed into the OCP, which also affect the population projections.

Table 2 also breaks out unaccounted for water losses at 5.3%, which has been the average over the past five years. This same percentage has been used for the projections and is also included on new water demands due to development, as shown in the table. The resultant projections include a total 2035 city-wide demand of 34,657 AFY or 21,484 gpm. It should be noted that this demand is conservative in that it does not include additional conservation measures that will likely reduce demands in the future.

Table 2
City of Huntington Beach Demand Projections

	2010	2015	2020	2025	2030	2035
OCP DEVELOPMENT (excluding B-E & Downtown SPs)						
Residential Single Family Detached (DU)	0	273	242	87	308	5
Residential SFD Demand Factor (gpd/DU)[1]	212	212	212	212	212	212
SFD Sub-total (gpd)	**0**	**57,903**	**51,328**	**18,453**	**65,327**	**1,061**
Other Housing Units	0	682	237	1,036	184	582
Other Housing Demand Factor (gpd/DU)[2]	161	161	161	161	161	161
Other Housing Sub-total (gpd)	**0**	**109,802**	**38,157**	**166,796**	**29,624**	**93,702**
OCP RESIDENTIAL WATER DEMAND (gpd)	**0**	**167,705**	**89,485**	**185,249**	**94,951**	**94,763**
BEACH EDINGER SPECIFIC PLAN						
Residential (DU)	0	0	797	1,918	953	832
Residential Demand Factor (gpd/DU)	140	140	140	140	140	140
Residential Sub-total (gpd)	**0**	**0**	**111,580**	**268,520**	**133,420**	**116,480**
Hotel (Rooms)	0	0	0	200	150	0
Hotel Demand Factor (gpd/DU)	130	130	130	130	130	130
Hotel Sub-total (gpd)	**0**	**0**	**0**	**26,000**	**19,500**	**0**
Office/Retail (sf)	0	53,400	12,600	259,000	281,000	231,000
Office/Retail Demand Factor (gpd/sf)	0.15	0.15	0.15	0.15	0.15	0.15
Office/Retail Sub-total (gpd)	**0**	**8,010**	**1,890**	**38,850**	**42,150**	**34,650**
Landscaping/ROW	0	94,697	94,700	94,700	94,700	94,700
Landscaping/ROW Demand Factor (gpd/sf)	0.01	0.01	0.01	0.01	0.01	0.01
Landscaping/ROW Sub-total (gpd)	**0**	**947**	**947**	**947**	**947**	**947**
Restaurant (sf)	0	22,152	22,152	22,152	22,152	22,512
Restaurant Demand Factor (gpd/sf)	1.5	1.5	1.5	1.5	1.5	1.5
Restaurant Sub-total (gpd)	**0**	**33,228**	**33,228**	**33,228**	**33,228**	**33,768**
(gpd)	**0**	**42,185**	**147,645**	**367,545**	**229,245**	**185,845**
DOWNTOWN SPECIFIC PLAN						
Residential (DU)	0	0	216	216	216	0
(70 gpcdx2.41 persons/DU)	169	169	169	169	169	169
Residential Sub-total (gpd)	**0**	**0**	**36,439**	**36,439**	**36,439**	**0**
Hotel (Rooms)	0	0	135	100	0	0
(70 gpcdx2.0 persons/room)	140	140	140	140	140	140
Hotel Sub-total (gpd)	**0**	**0**	**18,900**	**14,000**	**0**	**0**
Office/Retail (sf)	0	0	102,084	102,084	102,083	0
Office/Retail Demand Factor (gpd/sf)	0.15	0.15	0.15	0.15	0.15	0.15
Office/Retail Sub-total (gpd)	**0**	**0**	**15,313**	**15,313**	**15,312**	**0**
Cultural Facilities (sf)	0	6,000	6,000	6,000	6,000	6,000
Cultural Facilities Demand Factor (gpd/sf)	0.15	0.15	0.15	0.15	0.15	0.15
Cultural Facilities Sub-total (gpd)	**0**	**900**	**900**	**900**	**900**	**900**
Restaurant (sf)	0	0	30,777	30,777	30,778	0
Restaurant Demand Factor (gpd/sf)	1.5	1.5	1.5	1.5	1.5	1.5
Restaurant Sub-total (gpd)	**0**	**0**	**46,166**	**46,166**	**46,167**	**0**
DOWNTOWN SP WATER DEMAND (gpd)	**0**	**900**	**117,717**	**112,817**	**98,819**	**900**
CITY WATER DEMAND (gpd)	**27,362,075**	**27,572,865**	**27,927,713**	**28,593,324**	**29,016,338**	**29,297,846**
Unaccounted for Water[4]	1,531,352	1,543,149	1,563,008	1,600,260	1,623,934	1,639,689
TOTAL CITY WATER DEMAND (gpd)	**28,893,427**	**29,116,014**	**29,490,721**	**30,193,584**	**30,640,273**	**30,937,535**
TOTAL CITY OF WATER DEMAND (AFY) [3]	**32,367**	**32,616**	**33,036**	**33,823**	**34,324**	**34,657**
Incremental OCP Demand (incl. UAFW)		**177,091**	**94,493**	**195,616**	**100,265**	**100,066**
Incremental DT + B-E Demand (incl. UAFW)		**45,496**	**280,214**	**507,246**	**346,424**	**197,196**
OCP DEMAND	**-**	**177,091**	**271,584**	**467,201**	**567,466**	**667,532**
TOTAL CITY INCLUDING ONLY OCP	**28,893,427**	**29,070,518**	**29,165,011**	**29,360,628**	**29,460,892**	**29,560,958**
TOTAL CITY INCLUDING ONLY OCP (AFY)		**32,565**	**32,671**	**32,890**	**33,003**	**33,115**
DOWNTOWN & B-E SPs DEMAND	**-**	**45,496**	**325,710**	**832,956**	**1,179,380**	**1,376,577**
TOTAL CITY DEMAND	**28,893,427**	**29,116,014**	**29,490,721**	**30,193,584**	**30,640,273**	**30,937,535**

[1] Assumed Residential Single Family Detached Demand Factor is equal to the current OCP factor of (3.03 people/household) x (70 gpcpd).

[2] Assumed Other Housing Demand Factor is equal to the current OCP factor of (2.30 people/household multi-family over 5 units) x (70 gpcpd).

[3] City of Huntington Beach Water Demand for 2010 is equal to the Average Gross Use of 32,367 AF for FY 2006-2008, including recycled water.

[4] 2010 = Total Normal Year Unaccounted Water; Future unacounted water is expected to equal 5.03% of the future development demands (i.e. the average loss percentage over the last five years)

Blue cells at bottom are cumulative, include unaccounted for water (UAFW) and in gpd unless otherwise indicated

APPENDIX B

Build-out Demands & Distribution of Demands Technical Memorandum

TECHNICAL MEMORANDUM

To: Duncan Lee

From: Mike Swan

Date: February 14, 2012

Subject: Build-out Demands & Distribution of Demands for 2011 Water Master Plan & Financial Plan Update

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Water demand projections were developed for the City's 2010 Urban Water Management Plan (UWMP) through a detailed procedure and for consistency will be utilized for the 2011 Water Master Plan & Financial Plan Update. The purpose of this Technical Memorandum is to document the process used to develop build-out water demands.

Build-out water demands for this Water Master Plan Update were projected using the anticipated growth added to the City's historical water use as previously described in the "Existing and Projected Water Demands for 2011 Water Master Plan" Tech Memo, dated May 11, 2011. Based on that memo, the existing city water demand for an average normal year is 32,367 acre-feet per year (AFY) or 20,069 gallons per minute (gpm). Assuming build-out will occur by 2035, the city-wide demand is projected to be 34,657 AFY or 21,484 gpm as described in the May 11, 2011 Tech Memo. This represents an increase of 1,415 gpm or an approximate 7.1% growth over the existing demand (1,415/20,069).

As detailed in Table 2 of the May 11, 2011 Tech Memo, the demand was broken down between the Beach Edinger Corridors Specific Plan area, the Downtown Specific Plan area, and the remainder of the city. The additional 1,415 gpm in demand increase can be broken down between these three areas as shown in Table 1 below. As the table indicates, the Beach Edinger Corridors is expected to account for approximately 48% of the projected demand increase or 675 gpm, while the Downtown area is expected to account for approximately 16% of the increase or 230 gpm, with the overall city-wide area accounting for the remaining 36% of the increase of 510 gpm. As noted in the May 11, 2011 Tech Memo, this demand is considered conservative in that it does not include additional conservation measures that will likely reduce demands in the future.

In order to update the demands in the hydraulic model, we would recommend the following steps to obtain a build-out (2035) average day scenario:

- First, increase the demand on every node in the City by 2.5% (510/20,069). This can be accomplished by multiplying all demands by a factor of 1.025.
- Second, add the demands shown in Table 1, below to the current demands on the nodes corresponding to the intersections shown. This allocates the demands for the two major growth areas to their closest nodes in the water system.

Table 1
City of Huntington Beach Additional Water Demand at Build-Out (2035)

INTERSECTION	ADDITIONAL WATER DEMAND	
	gpm	% Demand
Beach Edinger Corridors Specifc Plan Area		
Edinger Ave. / Gothard St.	72	
Beach Blvd. / Edinger Ave.	67	
Beach Blvd. / Heil Ave.	67	
Beach Blvd. / Warner Ave.	67	
Beach Blvd. / Slater Ave.	67	
Beach Blvd. / Talbert Ave.	67	
Beach Blvd. / Ellis Ave.	67	
Beach Blvd. / Garfield Ave.	67	
Beach Blvd. / Yorktown Ave.	67	
Beach Blvd. / Adams St.	67	
TOTAL BEACH EDINGER	675	48
Downtown Specific Plan Area		
Orange Ave. / 6th St. / Atlanta Ave.	57	
Orange Ave. / 1st St.	58	
Pacific Coast Hwy. / 6th St.	57	
Pacific Coast Hwy. / 1th St.	58	
TOTAL DOWNTOWN	230	16
Total City-wide Area		
ALL NODES	510	36
TOTAL CITY DEMAND	**1,415**	**100**

PSOMAS

CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
REQUEST FOR ACTION

Item No. PW 13-02

SUBMITTED TO: Chairman and Members of the Commission

SUBMITTED BY: Travis K. Hopkins, PE, Director of Public Works

DATE: January 16, 2013

SUBJECT: Recommendation to establish a 25 mile per hour speed zone on Delaware Street adjacent to Manning Park

Statement of Issue: Staff is recommending that a 25 mile per hour speed zone be established during daytime hours on Delaware Street adjacent to Manning Park to improve traffic safety conditions at that location.

Funding Source: Funds to implement the recommended speed zone are included in the Public Works Department operating budget.

Impact on Future Maintenance Costs: No additional costs are anticipated.

Recommended Action: Motion to recommend to the City Council staff's recommendation to establish a 25 mile per hour daytime speed zone on Delaware Street adjacent to Manning Park.

Alternative Action(s): Deny approval and recommend alternative action.

Analysis: Residents near Manning Park have contacted Public Works staff several times over the past 6 months raising concerns about pedestrian and traffic safety in the area near the park. Residents suggested several measures of improving traffic safety in the area including the following:

- lowering the speed limit on Delaware Street
- making the intersection of Delaware Street and Detroit Avenue an all-way stop intersection
- extending parking prohibitions/red curb north of Detroit Avenue on Delaware Street
- installing a marked crosswalk across Delaware Street at Detroit Avenue

As a result of the inquiries, staff investigated conditions in the area and potential options for addressing the resident's concerns. While lowering the existing

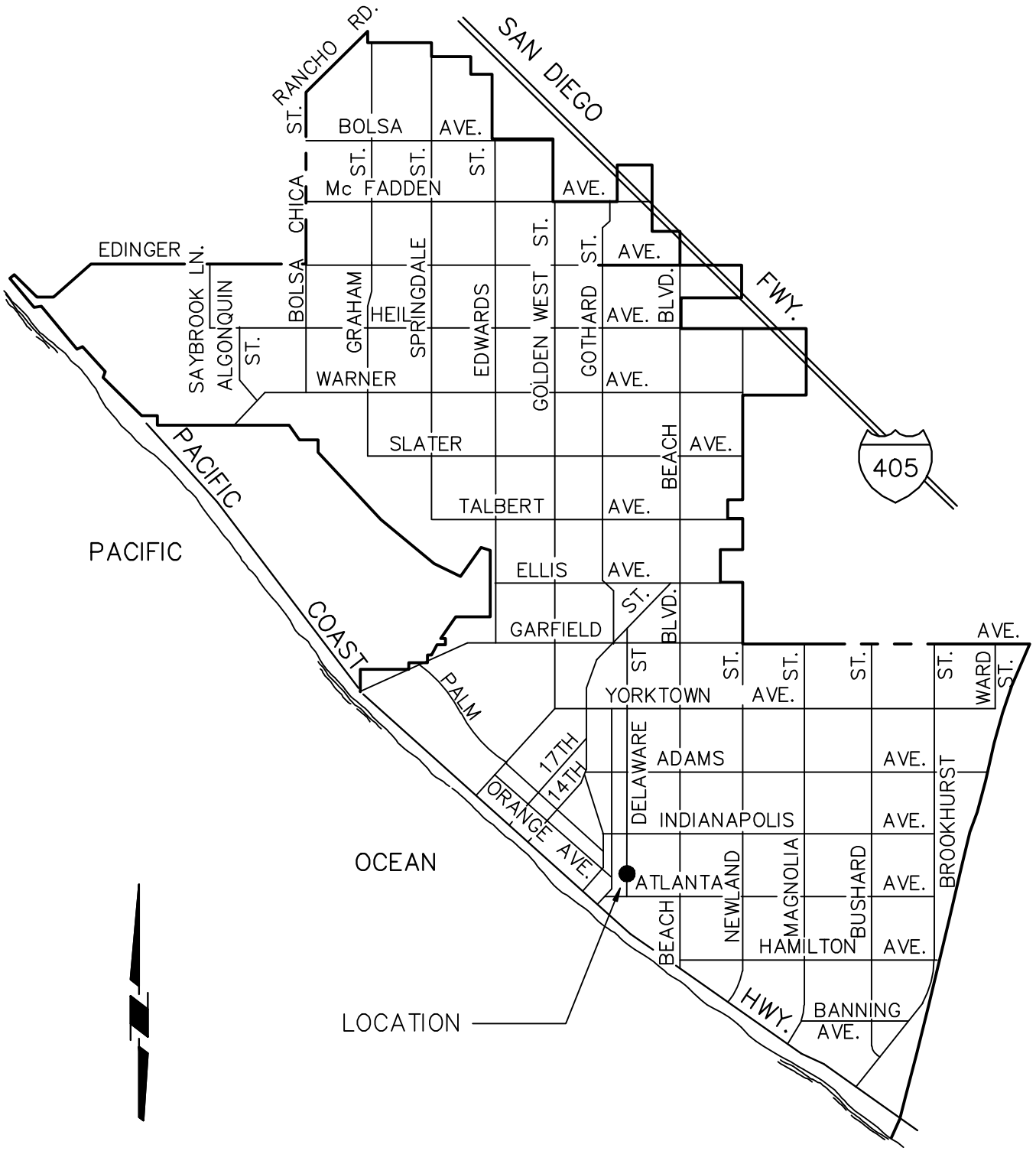
posted speed limit of 30 miles per hour is not an option that can be unilaterally implemented without jeopardizing enforceability of the speed limit, staff did identify an option available in the California Vehicle Code that allows a localized speed limit of 25 miles per hour near playground areas. This treatment combined with enforcement may help address many of the complaints voiced by residents in the specific area where they expressed their concerns. The amount of pedestrian activity and age of the pedestrians make a lower speed limit near the park a reasonable treatment commensurate with the conditions in the area.

Per California Vehicle Code Section 22357.1, a local jurisdiction, by ordinance or resolution, may establish a speed limit of 25 miles per hour on a street adjacent to a children's playground in a public park during particular hours or days when children are expected to use the facility. Manning Park has a children's play ground and is actively used by children during the day. The park is located on the west side Delaware Street approximately 600 feet north of Atlanta Avenue. The recommended speed zone would be established on Delaware Street between Detroit Avenue and the south boundary of Manning Park

Attachments:

1. Location Map
2. Location Aerial Photo

ATTACHMENT #1



CITY OF HUNTINGTON BEACH * PUBLIC WORKS

LOCATION MAP
MANNING PARK ON DELAWARE STREET

ATTACHMENT 1

ATTACHMENT #2

CITY OF HUNTINGTON BEACH * PUBLIC WORKS

LOCATION AERIAL PHOTO
MANNING PARK ON DELAWARE STREET

ATTACHMENT
2

CITY OF HUNTINGTON BEACH
PUBLIC WORKS COMMISSION
REQUEST FOR ACTION

Item No. PW 13-03

SUBMITTED TO: Chairman and Members of the Commission

SUBMITTED BY: Travis K. Hopkins, PE, Director of Public Works

DATE: January 16, 2013

SUBJECT: Amendments to Huntington Beach Municipal Code Chapter 10.44 – Parking Time Limits

Statement of Issue: Staff has identified several areas within the Chapter 10.44 of the Municipal Code where terminology and limitations appear to be in conflict or contradictory. Additionally, existing sections contain very restrictive statements that limit the ability of staff to use parking time limit restrictions to address a variety of circumstances and needs throughout the City. In some cases, parking restrictions have been implemented over the years that do not entirely conform to the limitations as stated in the code. As a result, staff has completed a comprehensive review of this chapter and is recommending the following modifications to better suit the practical application of these sections to meet a wide range of needs throughout the community.

Funding Source: Amendments to Chapter 10.44 of the Municipal Code does not require any separate funding.

Impact on Future Maintenance Costs: No impacts are anticipated.

Recommended Action: Motion to recommend to the City Council staff's recommendation to amend sections 10.44.010, 10.44.020, 10.44.030, and 10.44.040 of Chapter 10.44 of the Huntington Beach Municipal code relating to parking time limits.

Alternative Action(s): Deny approval or recommend alternative amendments to the Municipal Code sections related to parking time limits.

Analysis:

The following summarizes the proposed parking time limit amendments to Sections 10.44.010, 10.44.020, 10.44.030, and 10.44.040 of Municipal Code Chapter 10.44:

Section 10.44.010 Green Curb:

Amend the twenty-four (24) minute maximum time limit for green curb parking to allow setting parking time limits in time increments up to two (2) hours. The code as currently written in this section only allows parking for a maximum of twenty-four (24) minutes in green curb areas. The amended section will allow the flexibility to designate green curb parking time limits other than just twenty-four (24) minutes, and in time increments up to two (2) hours.

Section 10.44.020 Time Limitation Parking:

Amend the section making it a violation to park longer than any time limit as indicated by curb stencil or signs. This section currently applies to violations for parking longer than twelve (12) or twenty-four (24) minutes where those time limits are designated. The heading would be amended to read "Time Limitation Parking" instead of "Twelve or twenty-four minutes—Violation". By amending the heading, violations for parking longer than any time limit as specified by sign or curb stencil would be applicable.

Section 10.44.030 One Hour Parking:

Amend the section by removing the hours (9 a.m. and 6 p.m.) and days (any day except Sundays and holidays) one hour designated parking areas are in effect. This section currently states that one hour designated parking areas are only in effect between the hours of 9 a.m. and 6 p.m. any day except Sundays and holidays. At all other times the one hour parking areas are unrestricted. The amended section will permit any one hour designated parking area to be applicable any time and day as authorized by signs or curb stencil, providing the ability to impose when necessary, one hour parking restrictions any time or day.

Section 10.44.040 Two Hour Parking:

Amend the section by removing the hours (9 a.m. and 6 p.m.) and days (any day except Sundays and holidays) two hour designated parking areas are in effect. This section currently states that two hour designated parking areas are only in effect between the hours of 9 a.m. and 6 p.m. any day except Sundays and holidays. At all other times the two hour parking areas are unrestricted. The amended section will permit any two hour designated parking area to be applicable any time and day as authorized by signs or curb stencil, providing

the ability to impose when necessary, two hour parking restrictions any time or day.

Attachments:

1. Legislative draft of Huntington Beach Municipal Code Chapter 10.44

ATTACHMENT #1

LEGISLATIVE DRAFT

Chapter 10.44

PARKING--TIME LIMITS

(255-2/33, 276-11/25, 322-1/29, 373-7/34, 533-7/48, 566-11/50, 1155-8/65, 1935-11/74, 2115-11/76, 2177-5/77, 2276-5/78, 2514-12/81, 2644-12/83, 2692-7/84, 2795-10/85, 2855-12/86, 3011-9/89, 3136-5/92, 3257-11/94, 3336-12/96, 3699-4/05, 3735-5/06, 3742-8/06, 3823-4/09, 3922-11/11)

Sections:

10.44.010 ~~Twenty-four minute maximum~~Green Curb Marking. Green curb marking shall mean no stopping, standing or parking for a ~~period of time longer than twenty-four~~ designated increment of time not to exceed two ~~(24) minutes~~hours ~~at any time~~as authorized by signs or curb stencil. Taxi cabs shall not stand or park at any time where there are green curb markings. (276-11/25, 322-1/29, 533-7/48, 1155-8/65, 3257-11/94, 3922-11/11)

10.44.020 ~~Twelve or twenty-four minutes—Violation~~Time Limitation Parking. When authorized signs or curb ~~markings~~stencil have been determined by the Director of Public Works to be necessary and are in place giving notice thereof, no operator of any vehicle shall stop, stand or park ~~said~~any vehicle adjacent to any such legible curb ~~marking~~stencil or sign in violation thereof. (276-11/25, 322-1/29, 533-7/48, 1155-8/65)

10.44.030 One-hour parking. When authorized signs or curb ~~markings~~stencil have been determined by the Director of Public Works to be necessary and are in place giving notice thereof, no operator of any vehicle shall stop, stand or park ~~said~~any vehicle ~~between the hours of 9 a.m. and 6 p.m. of any day except Sundays and holidays~~ adjacent to any such legible curb stencil or sign for a period of time longer than one hour. (255-2/23, 566-11/50, 1155-8/65)

10.44.040 Two-hour parking. When authorized signs or curb ~~markings~~stencil have been determined by the Director of Public Works to be necessary and are in place giving notice thereof, no operator of any vehicle shall stop, stand or park

~~the~~any vehicle ~~between the hours of 9 a.m. and 6 p.m. of any day except Sundays and holidays~~adjacent to any such legible curb stencil or sign for a period of time longer than two hours. (322-1/29, 373-7/34, 1155-8/65)

10.44.050 Penalty--Continuing violations. Any person violating any provision of this chapter shall, upon a conviction thereof, be guilty of an infraction, and punishable by a fine not to exceed one hundred dollars ($100), provided further that each period of time a vehicle is left parked after the initial violation of such provisions shall be deemed a separate offense, equal to the maximum legal parking time for the particular time zone or parking space as designated in sections setting the maximum legal time. (1155-8/65, 2276-5/78)

10.44.060 Oversized vehicle parking regulations. Except as herein provided, no person shall park or leave standing upon any public street or highway in a residential district: (3699-04/05)

(a) Any motor vehicle over twenty-five (25) feet long measured from the extreme forward point to the extreme rear point, including extensions or attached vehicles; (3823-4/09)

(b) Any motor vehicle, over ninety-six (96) inches wide, measured at its widest point excluding side-view mirrors or similar extensions, designed, used or maintained for the transportation of property;

(c) Any motor vehicle, including buses, motor trucks, trailers, semitrailers, trailer coaches, or truck tractors as defined in the Vehicle Code, over ninety-six (96) inches wide, measured at its widest point excluding side-view mirrors or similar extensions, designed, used or maintained for the transportation of property;

(d) Any motor vehicle which is designed, used or maintained as farm machinery or a special purpose or equipment machine; (3699-04/05)

(e) Any nonmotorized vehicle, such as a semitrailer, trailer, trailer coach, utility trailer, two or more axle camper, or a one-axle camper, which has been detached from its drawing vehicle; or (1935-11/74, 2115-11/76, 2514-12/81, 2855-12/86, 3699-04/05)

(f) Any "recreational vehicle (RV)", over twenty (20) feet long measured from the extreme forward point to the extreme rear point, including extensions or attached vehicles. The term "recreational vehicle (RV)" shall have the same meaning as set forth in California Health and Safety Code Section 18010 or successor statute. (3699-04/05, 3823-4/09)

10.44.062 Recreational vehicle parking in a residential district-special permits.

(a) The Chief of Police may issue a temporary permit for the overnight parking of a recreational vehicle prohibited by 10.44.060 if there is a finding that the vehicle is used on a daily basis and on-premise parking is not reasonably available. A permit issued based on this finding shall not be valid for longer than six months. (3699-04/05)

(b) The Chief of Police may issue a temporary permit to persons who demonstrate by way of written statement from a licensed medical doctor, that the recreational vehicle prohibited by 10.44.060 must be kept near a residence for medical reasons. (3699-04/05)

10.44.065 Exceptions. Section 10.44.060 shall not apply to the following:

(a) Recreational vehicles as defined in Section 10.44.060, or unattached boat or personal water craft trailer, parked for the purpose of loading, or other short term use, provided that a permit has been issued in advance by the Chief of Police. A permit may be issued for loading, unloading, or other short-term use not to exceed twenty-four hours, provided that: (3699-04/05)

1. no more than sixteen (16) such periods are allowed in a calendar month; and (3699-04/05)

2. no more than eight days consecutively; and (3699-04/05, 3742-8/06)

3. no more than one hundred forty-four days in any twelve (12) month period.
(3735-5/06,3742-8/06)

Such parking shall be limited to the area in front of the residence from which the loading or unloading will occur, or in reasonable proximity thereto if the front of the residence is not available for parking. (3699-04/05)

(b) Nothing in this ordinance shall be construed to permit sleeping in a vehicle prohibited by Section 9.54.010 of the Huntington Beach Municipal Code. (3699-04/05)

(c) A permit may be issued for any oversized motor vehicle parked while used in performing or assisting in performing services or repairs on residential property. The permit will be valid for 45 days and will be renewed only upon proof that the vehicle is continuing to be used in performing the services described herein. (3699-04/05)

(d) Any oversized motor vehicle which is parked for not more than twenty-four (24) consecutive hours to make emergency repairs to such vehicle. Nothing herein shall be construed to permit violation of any restriction on vehicle repair elsewhere in the Huntington Beach Municipal Code. (3699-04/05)

(e) Any nonmotorized vehicle, such as a semitrailer, trailer, trailer coach, utility trailer, two or more axle camper, or a one-axle camper which has been detached from its drawing vehicle parked for a period not to exceed four (4) hours in any area other than a residential district. Successive acts of parking within a two-tenths of a mile area shall be presumed to be a single act of parking for purposes of this ordinance. (1935-11/74, 2115-11/76, 2514-12/81, 2855-12/86, 3699-04/05)

(f) Any recreational vehicle parked in reasonable proximity to a park between the hours of 6 a.m. and 9 p.m. (3699-04/05)

10.44.067 Street Sweeping – Compliance. All recreational vehicle permit holders shall comply with the City of Huntington Beach street sweeping parking regulations pursuant to Chapter 10.40 of the Huntington Beach Municipal Code and as thereafter amended. (3735-5/06)

10.44.070 Arterial highway oversize vehicle parking regulations.

(a) Except as provided in subsection (b) and (c) hereof, no person shall park or leave standing upon any arterial highway between the hours of 9 p.m. and 6 a.m., or for longer than two (2) hours at any other time, any motor vehicle over eighty-four (84) inches high, measured from the surface of the roadway to its highest point, or over eighty-four (84) inches wide, measured from its widest point, excluding side view mirrors or similar extensions on any of the following highways in the City of Huntington Beach:

Adams Avenue	Edinger Avenue	McFadden Avenue
Algonquin Street	Edwards Street	Newland Street
Argosy Avenue	Ellis Avenue	Pacific Coast Highway
Atlanta Avenue	Garfield Avenue	Seventeenth Street
Banning Avenue	Goldenwest Street	Slater Avenue
Beach Boulevard	Gothard Street	Springdale Street
Bolsa Avenue	Graham Street	Talbert Avenue
Bolsa Chica Street	Hamilton Avenue	Ward Street
Brookhurst Street	Heil Avenue	Warner Avenue
Bushard Street	Indianapolis Avenue	Yorktown Avenue
Center Avenue	Magnolia Street	

(2177-5/77, 2644-12/83, 2692-7/84, 2795-10/85, 2855-12/86, 3011-9/89, 3336-12/96)

(b) In case of emergency, oversize vehicles shall be removed immediately if between the hours of 9 p.m. and 6 a.m., otherwise they may park on the highways listed in this section provided that such vehicles shall be removed within four (4) hours. Emergency parking is defined to mean any vehicle left standing at the roadside because of mechanical breakdown or because of driver's physical incapacity to proceed. (3336-12/96)

(c) Nothwithstanding the prohibition contained in this section, wherever highway markings clearly indicate legal on-street parking in front of residential property facing any arterial highway set out in subsection (a) hereof, an oversized vehicle may park or stand in front of such residential property for not more than eight (8) consecutive hours to load or unload passengers or property, or to furnish commercial services or repairs to the premises. (3336-12/96)

10.44.080 Overnight Parking of Recreational Vehicle in Commercial or Industrial District.

No person shall park or leave a recreational vehicle over twenty (20) feet long measured from the extreme forward point to the extreme rear point, including extensions, in a commercial or industrial district between the hours of 9 p.m. and 6 a.m. (3699-04/05)