Appendix A: Resolution Adopting the 2010 Urban Water Management Plan

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Appendix B: References

Agency for Toxic Substances and Disease Registry Division of Health Assessment and Consultation. Public Health Assessment Fort Ord Marina, Monterey County, California. September 24, 1996.

Association of Monterey Bay Area Governments, Monterey Bay Area 2008 Regional Forecast Population, Housing Unit and Employment Projections for Monterey, San Benito and Santa Cruz Counties to the Year 2035, June 11, 2008

Byron Buck & Associates, Marina Coast Water District 2005 Urban Water Management Plan, December 2005.

California American Water Company:

Coastal Water Project, Draft Environmental Impact Report, prepared for the California Public Utilities Commission, January 2009

Coastal Water Project, Final Environmental Impact Report, prepared for the California Public Utilities Commission, October 2009

California Department of Finance website, www.dof.ca.gov, population estimate tables:

E-4 Historical Population Estimates for Cities, Counties and the State, 1991-2000, with 1990 and 2000 Census Counts

E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark

California Department of Water Resources:

20x2020 Water Conservation Plan, February 2010.

California Irrigation Management Information System (CIMIS) website

Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan, Draft December 2010.

Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, October 1, 2010.

Model Water Efficient Landscape Ordinance, September 10, 2009

California Urban Water Conservation Council.

BMP Costs and Savings Study. 2003.

Memorandum of Understanding Regarding Urban Water Conservation in California, As Amended June 9, 2010

Carollo Engineers, Marina Water Systems Master Plan, February 2007.

City of Marina:

2000 General Plan, Adopted October 21, 2000, Amended through December 2006.

Final Housing Element 2008-2014, certified September 1, 2009

City of Seaside:

2009-2014 Housing Element, adopted August 2010

Redevelopment Agency of the City of Seaside, Implementation Plan, 2007 – 2012, Seaside-Fort Ord Redevelopment Project Area, January 17, 2008

County of Monterey, 2010 Monterey County General Plan, October 26, 2010

Denise Duffy & Associates in association with RBF Consulting. Draft Environmental Impact Report Regional Urban Water Augmentation Project. June 2004.

Denise Duffy & Associates in association with RBF Consulting. Final Environmental Impact Report Regional Urban Water Augmentation Project. September, 2004.

Denise Duff & Associates, et. al. Final Draft Groundwater Inventory and Status Report. March 18, 2004.

Fort Ord Reuse Authority:

Capital Improvement Program, FY 2008/2009 through FY 2021/2022, June 13, 2008, including annual development projection update for 2010

Fort Ord Reuse Plan, 1996.

Reuse Plan EIR, 1997.

GRC Redevelopment Consultants, Implementation Plan 2007-2012 for the Seaside – Fort Ord Redevelopment Project Area, Prepared for the Redevelopment Agency of the City of Seaside, January 17, 2008.

Keyser Marston Associates, Inc., Implementation Plan for the Fort Ord Redevelopment Project Area, Prepared for the Redevelopment Agency of Monterey County, March 2007

LAFCO of Monterey County, Municipal Services Review for the Monterey Peninsula, 2006

Mactec Engineering and Consulting Inc. Former Fort Ord Environmental Cleanup. Fortordcleanup.com. 2005.

Marina Coast Water District:

2009 Consumer Confidence Report for Central Marina and Ord Community, April 2010

Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2010, approved November 9, 2010.

Water Supply Assessment and Written Verification of Supply for the Proposed Cypress Knolls Residential Project, prepared with Byron Buck & Associates, March 22, 2006.

Water Supply Assessment and Written Verification of Supply for the Proposed Resort at Del Rey Oaks, prepared with Byron Buck & Associates, December 2007.

Water Supply Assessment and Written Verification of Supply for the Proposed East Garrison Specific Plan Development, prepared with Byron Buck & Associates, June 3, 2004.

Water Supply Assessment and Written Verification of Supply for the City of Seaside Main Gate Specific Plan, prepared with Byron Buck & Associates, October 9, 2007.

Water Supply Assessment and Written Verification of Supply for the Proposed Marina Station Project, prepared with Byron Buck & Associates, January 4, 2006.

Water Supply Assessment and Written Verification of Supply for the Marina Heights Specific Plan, prepared with Byron Buck & Associates, December 15, 2003.

Water Supply Assessment and Written Verification of Supply for the Proposed University Villages Specific Plan Development and Marina Community Partners Project, prepared with Byron Buck & Associates, January 26, 2005.

Water Supply Assessment for the Monterey-Salinas Transit Whispering Oaks Business Park Project, prepared with Carollo Engineers, November 2010.

Quarterly Water Consumption Reports, periods ending: March 31, 2010; June 30, 2010; September 30 2010; and December 31, 2010.

Monterey County Water Resources Agency:

2009 Ground Water Summary Report, August 2010.

Agreement between the United States of America and the Monterey County Water Resources Agency concerning Annexation of Fort ord into Zones 2 and 2A of the Monterey County Water Resources Agency, Agreement No. A-06404, September 21, 1993.

Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands (1996). Document recorded in the Office of the Monterey County Recorder on August 7, 1996, at Reel 3404 Page 749.

Draft Environmental Impact Report/Environmental Impact Statement for the Salinas Valley Water Project. June 2001.

Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan, prepared by RMC Water and Environment, May 2006

Salinas Valley Water Project Engineer's Report, prepared by RMC Water and Environment, January 2003

RBF Consulting. Water Conservation Feasibility Study Draft. September 2003.

RBF Consulting. Regional Urban Recycled Water Distribution Project. 2003.

RMC Water and Environment, MCWD Recycled Water Project Basis of Design Report, 2006

WRIME. Deep Aquifer Investigative Study. May, 2003.

United States Census Bureau, American FactFinder website, www.census.gov

2000 Decennial Census Summary File 1 (SF1)

1990 Decennial Census Summary Tape File 1 (STF1)

Table SU-99-10, Population Estimates for States, Counties, Places, and Minor Civil Divisions: Annual Time Series, July 1, 1990 to July 1, 1999 (includes April 1, 1990 Population Estimates Base)

Table 4, Annual Estimates of the Resident Population for Incorporated Places in California: April 1, 2000 to July 1, 2009 (SUB-EST2009-04-06)

Appendix C: Land Use Forecast and Water Demand Projections by Jurisdiction

The following tables present the water demand projects for the Marina Coast Water District, based upon the development and redevelopment projections provided by the various jurisdictions. Water demands are estimated as a function of the size (acreage/square footage) or number of units of a development, depending on the type of land use, and a water demand unit factor that corresponds to that use. For each type of land use, Demand = Size x Unit Factor.

- Existing demands are estimated from the District's 2009 and 2010 water usage records for each jurisdictional area.
- For developments that have approved Specific Plans, the water demand factors and total water demand estimates have been taken from the respective Water Supply Assessments (WSAs) for these Specific Plan areas.
- For in-fill development under approved General Plans or Master Plans (e.g., the City of Marina, CSUMB), the District's standard water demand factors have been used with the in-fill land use projections provided by the jurisdiction.
- For the Ord Community, the initial development forecast was based upon the Fort Ord Reuse Authority's latest annual growth forecast, which is developed for CIP planning. The projected developments, generally by square footage or units, are then multiplied by the appropriate unit demand factors.
- For areas not reflected in the Fort Ord Reuse Authority growth forecast (Central Marina, the Army and State Parks), the initial projections reflected those in the 2005 UWMP. Each jurisdiction provided feedback used to update the 2010 demand projection.

Based upon the housing projections in the water demand tables, population projections were then developed. In-fill development was assumed to have the same number of persons per dwelling unit as the existing area. For new development, if the specific plan, the water supply assessment or the associated Environmental Impact Report projected a number of persons per housing unit, that factor was used. If a persons-per-dwelling-unit estimate did not exist, the new development was assumed to have the same occupancy as the city average.

Tables:

Table C1: 2010 Draft Water Demand by Jurisdiction (AFY)

	Jurisdiction	Existing*	2010	2015	2020	2025	2030	Allocation
Ord	CSUMB**	621	403	441	631	754	778	1,035
	Del Rey Oaks	0	0	326	527	527	527	243
	City of Monterey	0	0	0	92	92	92	65
	County of Monterey	4	4	627	1,087	1,087	1,087	710
	UCMBEST	2	2	93	276	474	474	230
	City of Seaside***	430	792	1,130	1,351	1,664	2,093	1,012
	U.S. Army	658	752	792	838	997	997	1,577
	State Parks and Rec.	0	0	12	18	20	25	45
	Marina Ord Comm.	280	281	812	1,537	1,738	1,739	1,325
	Marina Sphere	10	10	10	10	10	10	10
	FORA Strategic Res.	0	0	0	0	0	0	0
	Assumed Line Loss	71	348	348	348	348	348	348
Marina	Armstrong Ranch	0	0	0	550	680	680	920
	RMC Lonestar	0	0	0	0	0	500	500
	Marina Central	1,962	1,962	2,208	2,630	2,723	2,724	3,320
	Subtotal - Ord	2,076	2,592	4,591	6,715	7,712	8,172	6,600
	Subtotal - Marina	1,962	1,962	2,208	3,181	3,402	3,903	4,740
	Total	4,038	4,554	6,799	9,896	11,114	12,075	11,340

*Actual demands from calendar year 2009

** 2010 demands reflect 100% metered use

*** 2010 demands include Seaside Resort Golf

Table C2: 2005 UWMP Water Demands by Jurisdiction (AFY)

	Jurisdiction	2005	2010	2015	2020	2025		Allocation
Ord	CSUMB	677	920	1,081	1,150	1,192		1,035
	Del Rey Oaks	0	472	762	837	838		243
	City of Monterey	53	78	94	110	126		65
	County of Monterey	1	569	682	1,209	1,209		710
	UCMBEST	4	561	735	942	1,187		230
	City of Seaside	525	1,221	1,238	1,984	2,297		1,012
	U.S. Army	529	1,102	1,659	1,659	1,659		1,577
	State Parks and Rec.	0	0	12	45	45		45
	Marina Ord Comm.	302	2,309	2,773	2,773	2,773		1,325
	Marina Sphere	0	0	0	0	0		10
	FORA Strategic Res.	0	0	0	0	0		-230
	Assumed Line Loss	578	578	578	578	578		578
Marina	Armstrong Ranch	0	680	680	680	680		920
	RMC Lonestar	0	0	0	500	500		500
	Marina Central	2,200	2,366	2,534	2,617	2,632		3,320
	Subtotal - Ord	2,669	7,810	9,614	11,287	11,904		6,600
	Subtotal - Marina	2,200	3,046	3,214	3,797	3,812		4,740
	Total	4,869	10,856	12,828	15,084	15,716		11,340

Marina Ord	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																							
Marina Heights																							
Townhome	MAR	Dwelling Units			-	-	12	13	13	13	13	13	13	12									
Cluster Market/Bridge	MAR	Dwelling Units			4	5	47	19	19	19	19	19	19	18									
Market A	MAR	Dwelling Units			10	15	105	29	29	29	29	29	29	33									
Market B	MAR	Dwelling Units			6	10	85	34	34	34	34	34	34	33									
Estates	MAR	Dwelling Units		-	-	-	-	13	12	12	12	12	12	12	-								
Landscaping (Turf)	MAR	Acres			0.1	0.1	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3									
Landscaping (Non-Turf)	MAR	Acres					0.5	0.2	0.2	0.2	0.1	0.1	0.1	0.1									
Cypress Knolls																							
SF Home / Townhome	MAR	Dwelling Units								255	200			141									
Apartments	MAR	Dwelling Units								85				31									
Assisted Living	MAR	Dwelling Units												60									
Open Space	MAR	Acres								28.57													
Parklands	MAR	Acres								2.17													
Right of Way	MAR	Acres								27.79				5.51									
Dunes on Monterey Bay																							
Alley (small lot)	MAR	Dwelling Units			24	48	54	59	57														
Carriage	MAR	Dwelling Units			21	6	12	30	57														
Standard	MAR	Dwelling Units			12	20	44	24	15														
Standard (small lot)	MAR	Dwelling Units			15	25	48	28	15														
Duets	MAR	Dwelling Units			34	38	78	98	40	60	4												
Townhome (live-work)	MAR	Dwelling Units			16	52	50	21															
Townhome (mixed use)	MAR	Dwelling Units			4	8	8	4															
Apartments	MAR	Dwelling Units			12	48	36	12															
Landscaping (MCP)	MAR	Acres			5.00	5.00	5.00	4.20															
Landscaping (other)	MAR	Acres			2.00	4.00	2.10																
TAMC TOD	MAR	Dwelling Units						100	100														
Existing/Replacement Residential																							
Patton Park	MAR	Dwelling Units					32																
Shelter Outreach Plus	MAR	Dwelling Units			20																		
Interim Housing	MAR	Dwelling Units				21																	
Non Residential																							
SVMHS Development	MAR	Square Feet			10,000	15,000	15,000	16,000															
TAMC TOD (office/public facilities)	MAR	Square Feet						20,000	20,000														
Airport Economic Development Area	MAR	Square Feet					30,357	30,357	30,357	60,714	60,714	66,786	66,786	66,786	66,786	66,786							
Cypress Knolls Community Center	MAR	Square Feet								16,525													
Cypress Knolls Support Services	MAR	Square Feet								6,300													
TAMC TOD (retail)	MAR	Square Feet						37,500	37,500														
Marina Airport Hotel/Golf	MAR	Rooms																					
Marina High School	MAR	Square Feet							15,000	10,000													
CHOMP	MAR	Square Feet		33,000																			
Imjin Office Park	MAR	Square Feet	10,309	15,001	8,981	12,495																	
Monterey Peninsula College	MAR	Square Feet			15,700																		
Institute of Canine Studies	MAR	Square Feet					24,000		4,100		5,400		4,800		9,700		11300		12470				
UV - Planning Area A	MAR	Square Feet					385,000	20,000	16,000														
UV - Planning Area J	MAR	Square Feet						3,000	55,000	8,000	17,000												
UV - Planning Area B1	MAR	Square Feet							114,000	15,000	10,000	35,000	25,000	10,000									
UV - Planning Area V	MAR	Square Feet								12,000	5,000	2,000	5,500										
UV - Planning Area OP (1-5)	MAR	Square Feet									300,000	253,000	82,000	170,000	245,000								
UV - Planning Area T	MAR	Rooms										150											
UV - Planning Area Z	MAR	Square Feet											8,500	5,000	5,000	1,500							

Marina Coast Water District 2010 Urban Water Management Plan
Table C3: Water Demand Projection Details

Land Use Type	Land Use	Total	Units	Multiplier	Notes		Incremental Demand (AFY) 2010	2015	2020	2025	2030	Cumulative Demand (AFY) 2010	2015	2020	2025	2030
New Residential																
Marina Heights																
Townhome	Residential (8-15 units / acre)	102	Dwelling Units	0.25			0.00	6.25	16.25	3.00	0.00	0.00	6.25	22.50	25.50	25.50
Cluster Market/Bridge	Residential (8-15 units / acre)	188	Dwelling Units	0.25			0.00	18.75	23.75	4.50	0.00	0.00	18.75	42.50	47.00	47.00
Market A	SF Residential (5-8 units / acre)	337	Dwelling Units	0.33			0.00	52.47	47.85	10.89	0.00	0.00	52.47	100.32	111.21	111.21
Market B	SF Residential (5-8 units / acre)	338	Dwelling Units	0.33			0.00	44.55	56.10	10.89	0.00	0.00	44.55	100.65	111.54	111.54
Estates	SF Residential (< 5 units / acre)	85	Dwelling Units	0.5			0.00	6.50	30.00	6.00	0.00	0.00	6.50	36.50	42.50	42.50
Landscaping (Turf)	Landscape (turf)	3.0	Acres	2.5			0.00	3.00	3.75	0.75	0.00	0.00	3.00	6.75	7.50	7.50
Landscaping (Non-Turf)	Landscape (non-turf)	1.5	Acres	1.5	1		0.00	1.05	1.05	0.15	0.00	0.00	1.05	2.10	2.25	2.25
						Marina Ord Comm.	0.00	132.57	178.75	36.18	0.00	0.00	132.57	311.32	347.50	347.50
Cypress Knolls																
SF Home / Townhome	SF Residential (5-8 units / acre)	596	Dwelling Units	0.1319	1		0.00	0.00	60.02	18.60	0.00	0.00	0.00	60.02	78.62	78.62
Apartments	Multi family (> 15 units / acre)	116	Dwelling Units	0.1507	1		0.00	0.00	12.81	4.67	0.00	0.00	0.00	12.81	17.48	17.48
Assisted Living	Multi family (> 15 units / acre)	60	Dwelling Units	0.1672	1		0.00	0.00	0.00	10.03	0.00	0.00	0.00	0.00	10.03	10.03
Open Space	Landscape (non-turf)	28.57	Acres	0.5849	1		0.00	0.00	16.71	0.00	0.00	0.00	0.00	16.71	16.71	16.71
Parklands	Landscape (turf)	2.17	Acres	1.1244	1		0.00	0.00	2.44	0.00	0.00	0.00	0.00	2.44	2.44	2.44
Right of Way	Landscape (non-turf)	33.3	Acres	0.4586	1		0.00	0.00	12.74	2.53	0.00	0.00	0.00	12.74	15.27	15.27
						Marina Ord Comm.	0.00	0.00	104.72	35.83	0.00	0.00	0.00	104.72	140.55	140.55
Dunes on Monterey Bay																
Alley (small lot)	Residential (8-15 units / acre)	242	Dwelling Units	0.16491736	1		0.00	30.51	9.40	0.00	0.00	0.00	30.51	39.91	39.91	39.91
Carriage	Residential (8-15 units / acre)	126	Dwelling Units	0.25706349	1		0.00	17.74	14.65	0.00	0.00	0.00	17.74	32.39	32.39	32.39
Standard	SF Residential (5-8 units / acre)	115	Dwelling Units	0.29869565	1		0.00	29.87	4.48	0.00	0.00	0.00	29.87	34.35	34.35	34.35
Standard (small lot)	Residential (8-15 units / acre)	131	Dwelling Units	0.23877863	1		0.00	27.70	3.58	0.00	0.00	0.00	27.70	31.28	31.28	31.28
Duets	SF Residential (5-8 units / acre)	352	Dwelling Units	0.12392045	1		0.00	30.73	12.89	0.00	0.00	0.00	30.73	43.62	43.62	43.62
Townhome (live-work)	Residential (8-15 units / acre)	139	Dwelling Units	0.12791367	1		0.00	17.78	0.00	0.00	0.00	0.00	17.78	17.78	17.78	17.78
Townhome (mixed use)	Residential (8-15 units / acre)	24	Dwelling Units	0.16375	1		0.00	3.93	0.00	0.00	0.00	0.00	3.93	3.93	3.93	3.93
Apartments	Multi family (> 15 units / acre)	108	Dwelling Units	0.12185185	1		0.00	13.16	0.00	0.00	0.00	0.00	13.16	13.16	13.16	13.16
Landscaping (MCP)	Landscape (non-turf)	19.2	Acres	1.22916667	1		0.00	23.60	0.00	0.00	0.00	0.00	23.60	23.60	23.60	23.60
Landscaping (other)	Landscape (non-turf)	8.1	Acres	1.11111111	1		0.00	9.00	0.00	0.00	0.00	0.00	9.00	9.00	9.00	9.00
						Marina Ord Comm.	0.00	204.02	45.00	0.00	0.00	0.00	204.02	249.02	249.02	249.02
TAMC TOD	Multi family (> 15 units / acre)	200	Dwelling Units	0.25		Marina Ord Comm.	0.00	25.00	25.00	0.00	0.00	0.00	25.00	50.00	50.00	50.00
Existing/Replacement Residential																
Patton Park	Residential (8-15 units / acre)	32	Dwelling Units	0.25		Marina Ord Comm.	0.00	8.00	0.00	0.00	0.00	0.00	8.00	8.00	8.00	8.00
Shelter Outreach Plus	Residential (8-15 units / acre)	20	Dwelling Units	0.25	11	Marina Ord Comm.	0.00	5.00	0.00	0.00	0.00	0.00	5.00	5.00	5.00	5.00
Interim Housing	Residential (8-15 units / acre)	21	Dwelling Units	0.25	11	Marina Ord Comm.	0.00	5.25	0.00	0.00	0.00	0.00	5.25	5.25	5.25	5.25
Non Residential																
SVMHS Development	Office / R&D	56000	Square Feet	0.000135	11	Marina Ord Comm.	0.00	7.56	0.00	0.00	0.00	0.00	7.56	7.56	7.56	7.56
TAMC TOD (office/public facilities)	Office / R&D	40000	Square Feet	0.000135		Marina Ord Comm.	0.00	2.70	2.70	0.00	0.00	0.00	2.70	5.40	5.40	5.40
Airport Economic Development Area	Light Industrial	546429	Square Feet	0.00015	11	Marina Ord Comm.	0.00	9.11	42.80	30.05	0.00	0.00	9.11	51.91	81.96	81.96
Cypress Knolls Community Center	Various	16525	Square Feet	0.001	1	Marina Ord Comm.	0.00	0.00	9.22	0.00	0.00	0.00	0.00	9.22	9.22	9.22
Cypress Knolls Support Services	Office / R&D	6300	Square Feet	0.001	1	Marina Ord Comm.	0.00	0.00	6.31	0.00	0.00	0.00	0.00	6.31	6.31	6.31
TAMC TOD	Retail	75000	Square Feet	0.00021		Marina Ord Comm.	0.00	7.88	7.88	0.00	0.00	0.00	7.88	15.75	15.75	15.75
Marina Airport Hotel/Golf	Hotel, Motel and Timeshares		Rooms	0.17	1	Marina Ord Comm.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Marina High School	Schools (K-12)	25000	Square Feet	0.0003	11	Marina Ord Comm.	0.00	0.00	7.50	0.00	0.00	0.00	0.00	7.50	7.50	7.50
CHOMP	Institutional	33000	Square Feet	0.000185	11	Marina Ord Comm.	0.00	6.11	0.00	0.00	0.00	0.00	6.11	6.11	6.11	6.11
Imjin Office Park	Office / R&D	46786	Square Feet	0.000135	11	Marina Ord Comm.	1.39	4.92	0.00	0.00	0.00	1.39	6.32	6.32	6.32	6.32
Monterey Peninsula College	Higher Education	15700	Square Feet	0.0003	11	Marina Ord Comm.	0.00	4.71	0.00	0.00	0.00	0.00	4.71	4.71	4.71	4.71
Institute of Canine Studies	Office / R&D	71770	Square Feet	0.000135	11	Marina Ord Comm.	0.00	3.24	1.93	2.84	1.68	0.00	3.24	5.17	8.01	9.69
UV - Planning Area A	Various	421000	Square Feet	0.00025513	1	Marina Ord Comm.	0.00	103.33	4.08	0.00	0.00	0.00	103.33	107.41	107.41	107.41
UV - Planning Area J	Various	83000	Square Feet	0.00040458	1	Marina Ord Comm.	0.00	1.21	32.37	0.00	0.00	0.00	1.21	33.58	33.58	33.58
UV - Planning Area B1	Various	209000	Square Feet	0.00037813	1	Marina Ord Comm.	0.00	0.00	75.25	3.78	0.00	0.00	0.00	75.25	79.03	79.03
UV - Planning Area V	Various	24500	Square Feet	0.00067102	1	Marina Ord Comm.	0.00	0.00	16.44	0.00	0.00	0.00	0.00	16.44	16.44	16.44
UV - Planning Area OP (1-5)	Various	1050000	Square Feet	0.00020227	1	Marina Ord Comm.	0.00	0.00	128.44	83.94	0.00	0.00	0.00	128.44	212.38	212.38
UV - Planning Area T	Various	150	Rooms	0.20666667		Marina Ord Comm.	0.00	0.00	31.00	0.00	0.00	0.00	0.00	31.00	31.00	31.00
UV - Planning Area Z	Various	20000	Square Feet	0.000683		Marina Ord Comm.	0.00	0.00	5.81	7.85	0.00	0.00	0.00	5.81	13.66	13.66

Armstrong Ranch	**Jurisd**	**Units**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**
New Residential																							
Marina Station																							
Single Family Homes (15,000)	MAR	Dwelling Units									23	87	37										
Single Family Homes (6,500)	MAR	Dwelling Units									100	250	220	99									
Apartments	MAR	Dwelling Units									100	250	220	78									
Irrigated parkland	MAR	Acres									6.0	6.5											
Open Space (turf)	MAR	Acres									4.3												
Non Residential																							
Marina Station																							
Mixed Use Retail	MAR	Square Feet										15,000	30,000	15,000									
Office Uses	MAR	Square Feet										40,000	60,000	43,808									
Light Industrial	MAR	Square Feet											300,000	351,624									
Landscape (15% of indoor consumption)	MAR	Square Feet																					
System Loss (5%)	MAR	Square Feet																					

RMC Lonestar	**Jurisd**	**Units**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**
Non Residential																							
RMC Lonestar (added to FORA table)	MAR	Square Feet																	666667	666667	666667	666667	666667

Marina Central	**Jurisd**	**Units**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**
New Residential																							
In-Fill Development MF	MAR	Dwelling Units						182					167										
In-Fill Development SF	MAR	Dwelling Units						9					24										
Downtown Specific Plan	MAR	Dwelling Units							160	160	160	160	160	160	160	160	160	160	160	160	160	160	160
Non Residential																							
Hotel / Motel	MAR	Rooms						400															
Retail and Restaurants	MAR	Square Feet						46000					46000										
Other Commercial	MAR	Square Feet						60000															
Institutional	MAR	Square Feet						5000					5000										
Schools	MAR	Square Feet						77760					110500										
Landscape (turf)	MAR	Acres						8					16										
Downtown Specific Plan - Office	MAR	Square Feet							8400	8400	8400	8400	8400	8400	8400	8400	8400	8400	8400	8400	8400	8400	8400
Downtown Specific Plan - Retail / Comemrcial	MAR	Square Feet							16950	16950	16950	16950	16950	16950	16950	16950	16950	16950	16950	16950	16950	16950	16700

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
Marina Station					
Single Family Homes (15,000)	SF Residential (< 5 units / acre)	147	Dwelling Units	0.5	11
Single Family Homes (6,500)	SF Residential (5-8 units / acre)	669	Dwelling Units	0.33	11
Apartments	Multi family (> 15 units / acre)	648	Dwelling Units	0.25	11
Irrigated parkland	Landscape (turf)	12.5	Acres	2.5	11
Open Space (turf)	Landscape (turf)	4.3	Acres	2.5	11
Non Residential					
Marina Station					
Mixed Use Retail	Retail	60000	Square Feet	0.00021	11
Office Uses	Office / R&D	143808	Square Feet	0.000135	11
Light Industrial	Light Industrial	651624	Square Feet	0.00015	11
Landscape (15% of indoor consumption)			Square Feet		
System Loss (5%)			Square Feet		

	Incremental Demand (AFY)					Cumulative Demand (AFY)				
	2010	2015	2020	2025	2030	2010	2015	2020	2025	2030
	0.00	0.00	73.50	0.00	0.00	0.00	0.00	73.50	73.50	73.50
	0.00	0.00	188.10	32.67	0.00	0.00	0.00	188.10	220.77	220.77
	0.00	0.00	142.50	19.50	0.00	0.00	0.00	142.50	162.00	162.00
	0.00	0.00	31.25	0.00	0.00	0.00	0.00	31.25	31.25	31.25
	0.00	0.00	10.75	0.00	0.00	0.00	0.00	10.75	10.75	10.75
Armstrong Ranch	0.00	0.00	446.10	52.17	0.00	0.00	0.00	446.10	498.27	498.27
Armstrong Ranch	0.00	0.00	9.45	3.15	0.00	0.00	0.00	9.45	12.60	12.60
Armstrong Ranch	0.00	0.00	13.50	5.91	0.00	0.00	0.00	13.50	19.41	19.41
Armstrong Ranch	0.00	0.00	45.00	52.74	0.00	0.00	0.00	45.00	97.74	97.74
Armstrong Ranch	0.00	0.00	10.19	9.27	0.00	0.00	0.00	10.19	19.46	19.46
Armstrong Ranch	0.00	0.00	26.21	6.16	0.00	0.00	0.00	26.21	32.37	32.37

Land Use Type	Land Use	Total	Units	Multiplier	Notes
Non Residential					
RMC Lonestar (added to FORA table)	Light Industrial	3333333.3	Square Feet	0.00015	

	Incremental Demand (AFY)					Cumulative Demand (AFY)				
	2010	2015	2020	2025	2030	2010	2015	2020	2025	2030
RMC Lonestar	0.00	0.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	500.00

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
In-Fill Development MF	Multi family (> 15 units / acre)	349	Dwelling Units	0.25	12
In-Fill Development SF	SF Residential (5-8 units / acre)	33	Dwelling Units	0.33	12
Downtown Specific Plan	Multi family (> 15 units / acre)	2400	Dwelling Units	0.25	11
Non Residential					
Hotel / Motel	Hotel, Motel and Timeshares	400	Rooms	0.17	
Retail and Restaurants	Restaurant	92000	Square Feet	0.00145	
Other Commercial	Other Commercial	60000	Square Feet	0.0003	
Institutional	Institutional	10000	Square Feet	0.0003	
Schools	Schools (K-12)	188260	Square Feet	0.0003	
Landscape (turf)	Landscape (turf)	24	Acres	2.5	
Downtown Specific Plan - Office	Office / R&D	126000	Square Feet	0.000135	
Downtown Specific Plan - Retail / Comemrcial	Other Commercial	254000	Square Feet	0.0003	

	Incremental Demand (AFY)					Cumulative Demand (AFY)				
	2010	2015	2020	2025	2030	2010	2015	2020	2025	2030
Marina Central	0.00	45.50	41.75	0.00	0.00	0.00	45.50	87.25	87.25	87.25
Marina Central	0.00	2.97	7.92	0.00	1.00	0.00	2.97	10.89	10.89	11.89
Marina Central	0.00	0.00	200.00	80.00	0.00	0.00	0.00	200.00	280.00	280.00
Marina Central	0.00	68.00	0.00	0.00	0.00	0.00	68.00	68.00	68.00	68.00
Marina Central	0.00	66.70	66.70	0.00	0.00	0.00	66.70	133.40	133.40	133.40
Marina Central	0.00	18.00	0.00	0.00	0.00	0.00	18.00	18.00	18.00	18.00
Marina Central	0.00	1.50	1.50	0.00	0.00	0.00	1.50	3.00	3.00	3.00
Marina Central	0.00	23.33	33.15	0.00	0.00	0.00	23.33	56.48	56.48	56.48
Marina Central	0.00	20.00	40.00	0.00	0.00	0.00	20.00	60.00	60.00	60.00
Marina Central	0.00	0.00	5.67	2.27	0.00	0.00	0.00	5.67	7.94	7.94
Marina Central	0.00	0.00	25.43	10.17	0.00	0.00	0.00	25.43	35.60	35.60

Monterey County	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																							
East Garrison I																							
Market Rate	MCO	Dwelling Units		-	-	37	171	289	308	189	56												
Affordable	MCO	Dwelling Units		-	-	8	43	97	144	105	23	-	-	-	-								
Monterey Horse Park	MCO	Dwelling Units					330	330	283														
Non Residential																							
Monterey County Office																							
Horse Park	MCO	Square Feet					25,000	25,000	-														
Whispering Oaks Business Park	MCO	Square Feet								20,000	20,000	10,240											
Intergarrison Rd Office Park	MCO	Square Feet				127,200	127,200	127,200	127,200	127,000													
East Garrison I Office Development	MCO	Square Feet				6,000	12,000	12,000	5,000														
MST Bus Maint & Opns Facility	MCO	Square Feet		43,750																			
Monterey County Light Ind.																							
Horse Park	MCO	Square Feet					50,000	50,000	35,000	-	-	-											
Whispering Oaks Business Park	MCO	Square Feet		80,000	80,000	80,000	69,150	-	-	-	-	-											
MST Bus Maint & Opns Facility	MCO	Square Feet		118,675																			
Monterey County Retail	MCO																						
Whispering Oaks Business Park	MCO	Square Feet								30,000	30,000	17,280											
East Garrison I Retail	MCO	Square Feet						20,000	20,000														
East Garrison I Arts Complex	MCO	Square Feet																					
East Garrison I Public Facilities	MCO	Square Feet																					
Ord Market	MCO	Square Feet																					
Horse Park	MCO	Square Feet					100,000	100,000	100,000	120,000													
Horse Park (Parker Flat) Hotel	MCO	Rooms						200															
East Garrison Landscaping	MCO	Acres							10.44	4.94													

CSUMB	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																							
CSUMB Housing	CSU/MAR	Dwelling Units						95	95	95	95	48	48	48	48	48	48	48	48				
Non Residential																							
CSUMB Academic and Administrative Buildings	CSUMB	Square Feet						101,852	101,852	101,852	101,852				88,888	88,888	88,888	88,888	88,888				
CSUMB Landscaping	CSUMB	Acres								5.00	10.00	11			7								

UCMBEST	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																							
UC 8th Street	UC/MCO	Dwelling Units				33	33	33	33	33	33	33	33	33	33								
UC East Campus - SF	UC/MCO	Dwelling Units							67					67	66								
UC East Campus - MF	UC/MCO	Dwelling Units																					
Non Residential																							
UC Eight Street	UC/MCO	Square Feet				19,602	19,602	19,602	19,602	19,602	19,602	19,602	19,602	19,602	19,602								
UC Central South Campus	UC/MAR	Square Feet																					
UC Central North & West Campuses	UC/MAR	Square Feet	-	-	40,000	61,417	61,417	61,417	61,417	67,559	67,559	67,559	67,559	67,559	67,559								
UC Central North & West Campuses	UC/MAR	Square Feet				6,346	6,346	6,346	6,346	6,981	6,981	6,981	6,981	6,981	6,981								
UC Central North & West Campuses	UC/MAR	Square Feet	-	-	20,000	20,408	20,408	20,408	20,408	22,448	22,448	22,448	22,448	22,448	22,448								
UC South Campus	UC/MAR	Square Feet																					
UC East Campus	UC/MCO	Square Feet							26,000					26,000									
UC Eight Street	UC/MCO	Square Feet				19,602	19,602	19,602	19,602	19,602	19,602	19,602	19,602	19,602	19,602								
UC East Campus	UC/MCO	Rooms												250									
UC Central North & West Campuses	UC/MAR	Rooms		-	-	-	-	-	-	-	-	-	-	150	-								

Land Use Type	Land Use	Total	Units	Multiplier	Notes		Incremental Demand (AFY) 2010	2015	2020	2025	2030	Cumulative Demand (AFY) 2010	2015	2020	2025	2030
New Residential																
East Garrison					1											
Market rate	SF Residential (< 5 units / acre)	1050	Dwelling Units	0.3			0.00	149.10	165.90	0.00	0.00	0.00	149.10	315.00	315.00	315.00
Affordable	SF Residential (5-8 units / acre)	420	Dwelling Units	0.186			0.00	27.53	50.59	0.00	0.00	0.00	27.53	78.12	78.12	78.12
Monterey Horse Park	SF Residential (5-8 units / acre)	943	Dwelling Units	0.33	8		0.00	217.80	93.39	0.00	0.00	0.00	217.80	311.19	311.19	311.19
						County of Monterey	0.00	394.43	309.88	0.00	0.00	0.00	394.43	704.31	704.31	704.31
Monterey County Office																
Horse Park	Office / R&D	50000	Square Feet	0.000135		County of Monterey	0.00	6.75	0.00	0.00	0.00	0.00	6.75	6.75	6.75	6.75
Whispering Oaks Business Park	Office / R&D	50240	Square Feet	0.000166	14	County of Monterey	0.00	0.00	8.35	0.00	0.00	0.00	0.00	8.35	8.35	8.35
Intergarrison Rd Office Park	Office / R&D	635800	Square Feet	0.000135		County of Monterey	0.00	51.52	34.32	0.00	0.00	0.00	51.52	85.83	85.83	85.83
East Garrison I Office Development	Office / R&D	35000	Square Feet	0.000135		County of Monterey	0.00	4.05	0.68	0.00	0.00	0.00	4.05	4.73	4.73	4.73
MST Bus Maint & Opns Facility	Office / R&D	43750	Square Feet	0.000124	14	County of Monterey	0.00	5.42	0.00	0.00	0.00	0.00	5.42	5.42	5.42	5.42
Monterey County Light Ind.																
Horse Park	Light Industrial	135000	Square Feet	0.00015		County of Monterey	0.00	15.00	5.25	0.00	0.00	0.00	15.00	20.25	20.25	20.25
Whispering Oaks Business Park	Light Industrial	309150	Square Feet	0.000166	14	County of Monterey	0.00	51.40	0.00	0.00	0.00	0.00	51.40	51.40	51.40	51.40
MST Bus Maint & Opns Facility	Light Industrial	118675	Square Feet	0.000124	14	County of Monterey	0.00	14.70	0.00	0.00	0.00	0.00	14.70	14.70	14.70	14.70
Monterey County Retail																
Whispering Oaks Business Park	Retail	77280	Square Feet	0.000166	14	County of Monterey	0.00	0.00	12.85	0.00	0.00	0.00	0.00	12.85	12.85	12.85
East Garrison I Retail	Retail	40000	Square Feet	0.00021	8	County of Monterey	0.00	4.20	4.20	0.00	0.00	0.00	4.20	8.40	8.40	8.40
East Garrison I Arts Complex	Retail		Square Feet	0.0001406	8	County of Monterey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
East Garrison I Public Facilities	Retail		Square Feet	0.0003	8	County of Monterey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ord Market	Retail		Square Feet	0.00021		County of Monterey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Horse Park	Retail	420000	Square Feet	0.00021		County of Monterey	0.00	42.00	46.20	0.00	0.00	0.00	42.00	88.20	88.20	88.20
Horse Park (Parker Flat) Hotel	Hotel, Motel and Timeshares	200	Rooms	0.17		County of Monterey	0.00	34.00	0.00	0.00	0.00	0.00	34.00	34.00	34.00	34.00
East Garrison Landscaping	Landscape (turf)	15.38	Acres	2.5		County of Monterey	0.00	0.00	38.45	0.00	0.00	0.00	0.00	38.45	38.45	38.45

Land Use Type	Land Use	Total	Units	Multiplier	Notes		Incremental Demand (AFY) 2010	2015	2020	2025	2030	Cumulative Demand (AFY) 2010	2015	2020	2025	2030
New Residential																
CSUMB Housing	Multi family (> 15 units / acre)	764	Dwelling Units	0.25		CSUMB	0.00	23.75	95.25	60.00	12.00	0.00	23.75	119.00	179.00	191.00
					5											
					5, 6											
CSUMB Academic and Administrative Bldgs	Office / R&D	851848	Square Feet	0.000135		CSUMB	0.00	13.75	41.25	48.00	12.00	0.00	13.75	55.00	103.00	115.00
CSUMB Landscaping	Landscape (non-turf)	32.85	Acres	2.1		CSUMB	0.00	0.00	53.97	15.02	0.00	0.00	0.00	53.97	68.99	68.99

Land Use Type	Land Use	Total	Units	Multiplier	Notes		Incremental Demand (AFY) 2010	2015	2020	2025	2030	Cumulative Demand (AFY) 2010	2015	2020	2025	2030
New Residential																
UC 8th Street	Multi family (> 15 units / acre)	330	Dwelling Units	0.25		UCMBEST	0.00	24.75	41.25	16.50	0.00	0.00	24.75	66.00	82.50	82.50
UC East Campus - SF	SF Residential (< 5 units / acre)	200	Dwelling Units	0.5		UCMBEST	0.00	0.00	33.50	66.50	0.00	0.00	0.00	33.50	100.00	100.00
UC East Campus - MF	Multi family (> 15 units / acre)		Dwelling Units	0.25		UCMBEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UC Eight Street	Office / R&D	196020	Square Feet	0.000135		UCMBEST	0.00	7.94	13.23	5.29	0.00	0.00	7.94	21.17	26.46	26.46
UC Central South Campus	Office / R&D		Square Feet	0.000135		UCMBEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UC Central North & West Campuses	Office / R&D	691022	Square Feet	0.000135		UCMBEST	0.00	30.27	44.77	18.24	0.00	0.00	30.27	75.05	93.29	93.29
UC Central North & West Campuses	Retail	67270	Square Feet	0.00021		UCMBEST	0.00	4.00	7.20	2.93	0.00	0.00	4.00	11.19	14.13	14.13
UC Central North & West Campuses	Light Industrial	236320	Square Feet	0.00015		UCMBEST	0.00	12.18	16.53	6.73	0.00	0.00	12.18	28.71	35.45	35.45
UC South Campus	Retail		Square Feet	0.00021		UCMBEST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UC East Campus	Retail	52000	Square Feet	0.00021		UCMBEST	0.00	0.00	5.46	5.46	0.00	0.00	0.00	5.46	10.92	10.92
UC Eight Street	Retail	196020	Square Feet	0.00021		UCMBEST	0.00	12.35	20.58	8.23	0.00	0.00	12.35	32.93	41.16	41.16
UC East Campus	Hotel, Motel and Timeshares	250	Rooms	0.17		UCMBEST	0.00	0.00	0.00	42.50	0.00	0.00	0.00	0.00	42.50	42.50
UC Central North & West Campuses	Hotel, Motel and Timeshares	150	Rooms	0.17		UCMBEST	0.00	0.00	0.00	25.50	0.00	0.00	0.00	0.00	25.50	25.50

Del Rey Oaks	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																							
Del Rey Oaks																							
Golf Villas	DRO	Dwelling Units				37	13																
Patio Homes	DRO	Dwelling Units				32	4																
Condos	DRO	Dwelling Units				40	160	176															
Workforce	DRO	Dwelling Units					70	68															
Townhomes/Senior Casitas	DRO	Dwelling Units				21	40	30															
Non Residential																							
Del Rey Oaks Office	DRO	Square Feet				100,000		100,000															
Del Rey Oaks Retail	DRO	Square Feet				20,000																	
Del Rey Oaks Hotel	DRO	Rooms				104	250	100															
Del Rey Oaks Timeshare	DRO	Rooms				48	48																
Resort Golf Course	DRO	Acres									92												

Monterey City	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Non Residential																							
Monterey City Office	MRY	Square Feet							129,500														
Industrial -- City Corp. Yard	MRY	Square Feet							250,000														
Industrial -- Public/Private	MRY	Square Feet							250,000														

US Army	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Residential																							
Doe Park (Stilwell) Single Family	ARMY	Dwelling Units	146			20				48						-20							
Doe Park (Stilwell) Duplex	ARMY	Dwelling Units	138			20				47						-20							
Non Residential																							
Recreation Center	ARMY	Square Feet		10,900									8,340										
Rec Center Pool	ARMY	Square Feet		2,316																			
VA Medical Clinic	ARMY	Square Feet						126,000															
Child Development Center	ARMY	Square Feet													24,000								
Emergency Services Center	ARMY	Square Feet									40,000												

CA State Parks	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Non Residential																							
Fort Ord Dunes State Park	SP																						
Fort Ord Dunes State Park	SP	Square feet						75,000					33,333					16667					41667
American Youth Hostel (Seaside)	SP	Units						18					12	2									

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
Del Rey Oaks					
Golf Villas	SF Residential (< 5 units / acre)	50	Dwelling Units	0.5	
Patio Homes	SF Residential (< 5 units / acre)	36	Dwelling Units	0.5	
Condos	Multi family (> 15 units / acre)	376	Dwelling Units	0.25	
Workforce	Multi family (> 15 units / acre)	138	Dwelling Units	0.25	
Townhomes/Senior Casitas	SF Residential (5-8 units / acre)	91	Dwelling Units	0.33	
Del Rey Oaks Office	Office / R&D	200000	Square Feet	0.000135	
Del Rey Oaks Retail	Retail	20000	Square Feet	0.00021	
Del Rey Oaks Hotel	Hotel, Motel and Timeshares	454	Rooms	0.17	
Del Rey Oaks Timeshare	Hotel, Motel and Timeshares	96	Rooms	0.17	
Resort Golf Course	Landscape (turf)	92.4	Acres	2.16991342	1

Incremental Demand (AFY)

	2010	2015	2020	2025	2030
	0.00	25.00	0.00	0.00	0.00
	0.00	18.00	0.00	0.00	0.00
	0.00	94.00	0.00	0.00	0.00
	0.00	34.50	0.00	0.00	0.00
	0.00	30.03	0.00	0.00	0.00
Del Rey Oaks	0.00	201.53	0.00	0.00	0.00
Del Rey Oaks	0.00	27.00	0.00	0.00	0.00
Del Rey Oaks	-	4.20	0.00	0.00	0.00
Del Rey Oaks	-	77.18	0.00	0.00	0.00
Del Rey Oaks	0.00	16.32	0.00	0.00	0.00
Del Rey Oaks	0.00	0.00	200.50	0.00	0.00

Cumulative Demand (AFY)

2010	2015	2020	2025	2030
0.00	25.00	25.00	25.00	25.00
0.00	18.00	18.00	18.00	18.00
0.00	94.00	94.00	94.00	94.00
0.00	34.50	34.50	34.50	34.50
0.00	30.03	30.03	30.03	30.03
0.00	201.53	201.53	201.53	201.53
0.00	27.00	27.00	27.00	27.00
0.00	4.20	4.20	4.20	4.20
0.00	77.18	77.18	77.18	77.18
0.00	16.32	16.32	16.32	16.32
0.00	0.00	200.50	200.50	200.50

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
Monterey City Office	Office / R&D	129500	Square Feet	0.000135	
Industrial -- City Corp. Yard	Light Industrial	250000	Square Feet	0.00015	
Industrial -- Public/Private	Light Industrial	250000	Square Feet	0.00015	

Incremental Demand (AFY)

	2010	2015	2020	2025	2030
City of Monterey	0.00	0.00	17.48	0.00	0.00
City of Monterey	0.00	0.00	37.50	0.00	0.00
City of Monterey	0.00	0.00	37.50	0.00	0.00

Cumulative Demand (AFY)

2010	2015	2020	2025	2030
0.00	0.00	17.48	17.48	17.48
0.00	0.00	37.50	37.50	37.50
0.00	0.00	37.50	37.50	37.50

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
Doe Park (Stilwell) Single Family	SF Residential (5-8 units / acre)	194	Dwelling Units	0.33	9, 10
Doe Park (Stilwell) Duplex	Residential (8-15 units / acre)	185	Dwelling Units	0.33	9, 10
Non Residential					
Recreation Center	Institutional	19240	Square Feet	0.0003	9
Rec Center Pool	Institutional	2316	Square Feet	0.0002	9
VA Medical Clinic	Institutional	126000	Square Feet	0.00018	9
Child Development Center	Institutional	24000	Square Feet	0.0072	9
Emergency Services Center	Governmental	40000	Square Feet	0.0003	9

Incremental Demand (AFY)

	2010	2015	2020	2025	2030
U.S. Army	48.18	6.60	15.84	-6.60	0.00
U.S. Army	45.54	6.60	15.51	-6.60	0.00
U.S. Army	0.00	3.27	2.50	0.00	0.00
U.S. Army	0.00	0.46	0.00	0.00	0.00
U.S. Army	0.00	22.68	0.00	0.00	0.00
U.S. Army	0.00	0.00	0.00	172.80	0.00
U.S. Army	0.00	0.00	12.00	0.00	0.00

Cumulative Demand (AFY)

2010	2015	2020	2025	2030
48.18	54.78	70.62	64.02	64.02
45.54	52.14	67.65	61.05	61.05
0.00	3.27	5.77	5.77	5.77
0.00	0.46	0.46	0.46	0.46
0.00	22.68	22.68	22.68	22.68
0.00	0.00	0.00	172.80	172.80
0.00	0.00	12.00	12.00	12.00

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
Fort Ord Dunes State Park	Governmental			0.0676	2
Fort Ord Dunes State Park	Governmental	166667	Square Feet	0.00012	2
American Youth Hostel (Seaside)	Hotel, Motel and Timeshares	32	Units	0.17	2

Incremental Demand (AFY)

	2010	2015	2020	2025	2030
State Parks and Rec.	0.00	0.00	0.00	0.00	0.00
State Parks and Rec.	0.00	9.00	4.00	2.00	5.00
State Parks and Rec.	0.00	3.06	2.04	0.34	0.00

Cumulative Demand (AFY)

2010	2015	2020	2025	2030
0.00	0.00	0.00	0.00	0.00
0.00	9.00	13.00	15.00	20.00
0.00	3.06	5.10	5.44	5.44

Seaside	Jurisd	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Residential																							
Seaside Resort Housing	SEA	Dwelling Units		1			9	10	10	95													
Seaside Housing (Eastside)	SEA	Dwelling Units																	110	110	110	110	110
Seaside Affordable Housing Obligations	SEA	Dwelling Units			36	36																	
Workforce Housing (Army to Build)	SEA	Dwelling Units							26														
Market Rate Housing (Army to Build)	SEA	Dwelling Units							150														
State Parks Housing (Workforce housing)	SEA	Dwelling Units																					
Workforce Housing (Seaside)	SEA	Dwelling Units				29		-	-														
Seaside-Fort Ord Project Area	SEA	Dwelling Units											97	100	100	100	100	100	100	100	100	100	100
Seaside Housing (Eucalyptus)	SEA	Dwelling Units														190	190	190	190	182			
Non Residential																							
Main Gate																							
Conference	SEA	Square Feet					27,000																
Spa	SEA	Square Feet						24,000															
Large Format Retail	SEA	Square Feet					87,000																
In-Line Shops	SEA	Square Feet					281,000																
Movie Theater	SEA	Square Feet					51,500																
In-Line Food Service	SEA	Square Feet					10,000																
Restaurants	SEA	Square Feet					61,000																
Landscaping	SEA	Acres						10.41															
Hotel	SEA	Rooms						250															
Seaside Resort																							
Seaside Resort Golf Buildings	SEA	Square Feet		10,000																			
Seaside Resort Golf Clubhouse	SEA	Square Feet						16,300															
Seaside Golf Course Hotel	SEA	Rooms						330															
Seaside Golf Course Timeshares	SEA	Rooms							120	50													
Seaside Office (Monterey Blues)	SEA	Square Feet				60,000																	
Chartwell School	SEA	Square Feet	1,800																				
Monterey College of Law	SEA	Square Feet	7,133																				
Fitch Middle School	SEA	Square Feet																					
Marshall Elementary School	SEA	Square Feet																					
International School (former Hayes Elem)	SEA	Square Feet																					
Veterans' Cemeterey	SEA	Square Feet																					
Monterey Peninsula Trade & Conf Cntr	SEA	Square Feet							250,000														
Seaside Corp Yard Shop	SEA	Square Feet			25,320																		
Conference Facility	SEA	Square Feet						27,000															
Luxury Auto Mall	SEA	Square Feet																					

Land Use Type	Land Use	Total	Units	Multiplier	Notes
New Residential					
Seaside Resort Housing	SF Residential (< 5 units / acre)	125	Dwelling Units	0.5	
Seaside Housing (Eastside)	SF Residential (5-8 units / acre)	550	Dwelling Units	0.33	13
Seaside Affordable Housing Obligations	Residential (8-15 units / acre)	72	Dwelling Units	0.25	
Workforce Housing (Army to Build)	Residential (8-15 units / acre)	26	Dwelling Units	0.25	
Market Rate Housing (Army to Build)	SF Residential (< 5 units / acre)	150	Dwelling Units	0.5	
State Parks Housing (Workforce housing)	SF Residential (5-8 units / acre)		Dwelling Units	0.33	
Workforce Housing (Seaside)	SF Residential (5-8 units / acre)	29	Dwelling Units	0.33	
Seaside-Fort Ord Project Area	Multi family (> 15 units / acre)	1097	Dwelling Units	0.25	13
Seaside Housing (Eucalyptus)	SF Residential (5-8 units / acre)	942	Dwelling Units	0.33	13
Main Gate Conference	Office / R&D	27000	Square Feet	0.000135	
Main Gate Spa	Other Commercial	24000	Square Feet	0.0003	1
Main Gate Large Format Retail	Retail	87000	Square Feet	0.00005	1
Main Gate In-Line Shops	Retail	281000	Square Feet	0.00005	1
Main Gate Movie Theater	Other Commercial	51500	Square Feet	0.0002	1
Main Gate In-Line Food Service	Restaurant	10000	Square Feet	0.00247	1
Main Gate Restaurants	Restaurant	61000	Square Feet	0.0011	1
Main Gate Landscaping	Landscape (turf)	10.41	Acres	2.5	
Main Gate Hotel	Hotel, Motel and Timeshares	250	Rooms	0.17	
Seaside Resort Golf Buildings	Office / R&D	10000	Square Feet	0.000135	
Seaside Resort Golf Clubhouse	Restaurant	16300	Square Feet	0.00145	
Seaside Golf Course Hotel	Hotel, Motel and Timeshares	330	Rooms	0.17	
Seaside Golf Course Timeshares	Hotel, Motel and Timeshares	170	Rooms	0.17	
Seaside Office (Monterey Blues)	Office / R&D	60000	Square Feet	0.000135	
Chartwell School	Schools (K-12)	1800	Square Feet	0.0003	
Monterey College of Law	Institutional	7133	Square Feet	0.0003	
Fitch Middle School	Schools (K-12)		Square Feet	0.0003	
Marshall Elementary School	Schools (K-12)		Square Feet	0.0003	
International School (former Hayes Elem)	Schools (K-12)		Square Feet	0.0003	
Veterans' Cemeterey	Landscape (turf)		Square Feet	2.5	
Monterey Peninsula Trade & Conf Cntr	Office / R&D	250000	Square Feet	0.000135	
Seaside Corp Yard Shop	Light Industrial	25320	Square Feet	0.00015	
Conference Facility	Office / R&D	27000	Square Feet	0.0002	1
Luxury Auto Mall	Retail		Square Feet	0.00021	

	Incremental Demand (AFY)					Cumulative Demand (AFY)				
	2010	2015	2020	2025	2030	2010	2015	2020	2025	2030
City of Seaside	0.00	10.00	52.50	0.00	0.00	0.00	10.00	62.50	62.50	62.50
City of Seaside	0.00	0.00	0.00	0.00	181.50	0.00	0.00	0.00	0.00	181.50
City of Seaside	0.00	18.00	0.00	0.00	0.00	0.00	18.00	18.00	18.00	18.00
City of Seaside	0.00	0.00	6.50	0.00	0.00	0.00	0.00	6.50	6.50	6.50
City of Seaside	0.00	0.00	75.00	0.00	0.00	0.00	0.00	75.00	75.00	75.00
City of Seaside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City of Seaside	0.00	9.57	0.00	0.00	0.00	0.00	9.57	9.57	9.57	9.57
City of Seaside	0	0.00	24.25	125.00	125.00	0.00	0.00	24.25	149.25	274.25
City of Seaside	0.00	0.00	0.00	188.10	122.76	0.00	0.00	0.00	188.10	310.86
City of Seaside	0.00	3.65	0.00	0.00	0.00	0.00	3.65	3.65	3.65	3.65
City of Seaside	0.00	7.20	0.00	0.00	0.00	0.00	7.20	7.20	7.20	7.20
City of Seaside	0.00	4.35	0.00	0.00	0.00	0.00	4.35	4.35	4.35	4.35
City of Seaside	0.00	14.05	0.00	0.00	0.00	0.00	14.05	14.05	14.05	14.05
City of Seaside	0.00	11.20	0.00	0.00	0.00	0.00	11.20	11.20	11.20	11.20
City of Seaside	0.00	24.70	0.00	0.00	0.00	0.00	24.70	24.70	24.70	24.70
City of Seaside	0.00	68.60	0.00	0.00	0.00	0.00	68.60	68.60	68.60	68.60
City of Seaside	0.00	26.03	0.00	0.00	0.00	0.00	26.03	26.03	26.03	26.03
City of Seaside	0.00	42.50	0.00	0.00	0.00	0.00	42.50	42.50	42.50	42.50
City of Seaside	0.00	1.35	0.00	0.00	0.00	0.00	1.35	1.35	1.35	1.35
City of Seaside	0.00	23.64	0.00	0.00	0.00	0.00	23.64	23.64	23.64	23.64
City of Seaside	0.00	56.10	0.00	0.00	0.00	0.00	56.10	56.10	56.10	56.10
City of Seaside	0.00	0.00	28.90	0.00	0.00	0.00	0.00	28.90	28.90	28.90
City of Seaside	0.00	8.10	0.00	0.00	0.00	0.00	8.10	8.10	8.10	8.10
City of Seaside	0.54	0.00	0.00	0.00	0.00	0.54	0.54	0.54	0.54	0.54
City of Seaside	2.14	0.00	0.00	0.00	0.00	2.14	2.14	2.14	2.14	2.14
City of Seaside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City of Seaside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City of Seaside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City of Seaside	0.00	0.00	33.75	0.00	0.00	0.00	0.00	33.75	33.75	33.75
City of Seaside	0.00	3.80	0.00	0.00	0.00	0.00	3.80	3.80	3.80	3.80
City of Seaside	0.00	5.40	0.00	0.00	0.00	0.00	5.40	5.40	5.40	5.40
City of Seaside	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES:

1 Unique water demand multiplier based on the
2 State Parks and Rec. usage and timing taken from 2005 UWMP.
3 Landscaping area excludes temporary irrigation of 22.37 acres (which would increase the demand by 55.9 AFY for 3 years).
4 Area includes an additional 15% to account for landscaping demand.
5 Derived from Table 4-1 of the CSUMB Master Plan (December 2007)
6 An additional 87 AFY of recycled water is expected to be available to near 2014, per Table 4-1 of the CSUMB Master Plan (December 2007), not already factored into table.
7 CSUMB housing assumes water saving fixtures and retrofitting will provide an additional 85 AFY of water per Table 4-1 of the CSUMB Master Plan (December 2007), already factored into table
8 Updates per Nick Nichols, 11AUG10
9 Updates per Chris Spang, 4JAN11
10 OMC housing is being rennovated and replaced. The entry in 2022 reflects the net removal of 40 DU over the project life.
11 Updates per Maziar Bozorginia, 24JAN11
12 Per Marina 2009 Certified Housing Element, Table 3-1
13 Projections taken from Seaside-Fort Ord Redevelopment Project Area Implementation Plan 2007-2012
14 totals from Whispering Oaks Business Park WSA, October 2010
** Schaaf & Wheeler does not assume data from the water supply assessments is correct.

Table C4: 2010 Population Growth by Jurisdiction

	Jurisdiction	Existing*	2010	2015	2020	2025	2030
Ord	CSUMB		0	285	1,428	2,148	2,292
	Del Rey Oaks		0	1,487	1,487	1,487	1,487
	City of Monterey		0	0	0	0	0
	County of Monterey		0	3,303	5,844	5,844	5,844
	UCMBEST		0	257	861	1,378	1,378
	City of Seaside		0	363	1,497	4,707	8,973
	U.S. Army		1,704	1,824	2,109	1,989	1,989
	State Parks and Rec.		0	0	0	0	0
	Marina Ord Comm.		0	3,723	7,123	7,830	7,830
	Marina Sphere						
	FORA Strategic Res.						
	Assumed Line Loss						
Marina	Armstrong Ranch		0	0	3,591	4,085	4,085
	RMC Lonestar		0	0	0	0	0
	Marina Central		0	533	3,298	5,530	7,762

Subtotal - Ord	15,996	17,700	27,238	36,345	41,378	45,788
Subtotal - Marina	17,852	17,852	18,385	24,741	27,467	29,699
Total	33,848	35,552	45,623	61,086	68,845	75,487

*Population estimate from CA Dept. of Finance

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Marina Ord	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
Marina Heights																								
Townhome	MAR	Residential (8-15 units / acre)	Dwelling Units			0	0	12	13	13	13	13	13	13	12									
Cluster Market/Bridge	MAR	Residential (8-15 units / acre)	Dwelling Units			4	5	47	19	19	19	19	19	19	18									
Market A	MAR	SF Residential (5-8 units / acre)	Dwelling Units			10	15	105	29	29	29	29	29	29	33									
Market B	MAR	SF Residential (5-8 units / acre)	Dwelling Units			6	10	85	34	34	34	34	34	34	33									
Estates	MAR	SF Residential (< 5 units / acre)	Dwelling Units		0	0	0	0	13	12	12	12	12	12	12	0								
Cypress Knolls																								
SF Home / Townhome	MAR	SF Residential (5-8 units / acre)	Dwelling Units								255	200			141									
Apartments	MAR	Multi family (> 15 units / acre)	Dwelling Units								85				31									
Assisted Living	MAR	Multi family (> 15 units / acre)	Dwelling Units												60									
Dunes on Monterey Bay																								
Alley (small lot)	MAR	Residential (8-15 units / acre)	Dwelling Units			24	48	54	59	57														
Carriage	MAR	Residential (8-15 units / acre)	Dwelling Units			21	6	12	30	57														
Standard	MAR	SF Residential (5-8 units / acre)	Dwelling Units			12	20	44	24	15														
Standard (small lot)	MAR	Residential (8-15 units / acre)	Dwelling Units			15	25	48	28	15														
Duets	MAR	SF Residential (5-8 units / acre)	Dwelling Units			34	38	78	98	40	60	4												
Townhome (live-work)	MAR	Residential (8-15 units / acre)	Dwelling Units			16	52	50	21															
Townhome (mixed use)	MAR	Residential (8-15 units / acre)	Dwelling Units			4	8	8	4															
Apartments	MAR	Multi family (> 15 units / acre)	Dwelling Units			12	48	36	12															
TAMC TOD	MAR	Multi family (> 15 units / acre)	Dwelling Units						100	100														
Existing/Replacement Residential																								
Patton Park	MAR	Residential (8-15 units / acre)	Dwelling Units					32																
Shelter Outreach Plus	MAR	Residential (8-15 units / acre)	Dwelling Units			20																		
Interim Housing	MAR	Residential (8-15 units / acre)	Dwelling Units				21																	

Armstrong Ranch	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
Marina Station																								
Single Family Homes (15,000)	MAR	SF Residential (< 5 units / acre)	Dwelling Units									23	87	37										
Single Family Homes (6,500)	MAR	SF Residential (5-8 units / acre)	Dwelling Units									100	250	220	99									
Apartments	MAR	Multi family (> 15 units / acre)	Dwelling Units									100	250	220	78									

Marina Central	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
In-Fill Development MF	MAR	Multi family (> 15 units / acre)	Dwelling Units						182					167										
In-Fill Development SF	MAR	SF Residential (5-8 units / acre)	Dwelling Units						9					24										
Downtown Specific Plan	MAR	Multi family (> 15 units / acre)	Dwelling Units							160	160	160	160	160	160	160	160	160	160	160	160	160	160	160

Marina Coast Water District 2010 Urban Water Management Plan
Table C5: Population Growth Projection Details

Multiplier	Incremental Increase					Cumulative Increase				
Marina Heights	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
1.5	0	37.5	97.5	18	0	0	37.5	135	153	153
3.0	0	225	285	54	0	0	225	510	564	564
3.0	0	477	435	99	0	0	477	912	1011	1011
3.0	0	405	510	99	0	0	405	915	1014	1014
4.0	0	52	240	48	0	0	52	292	340	340
	0	**1196.5**	**1567.5**	**318**	**0**	**0**	**1196.5**	**2764**	**3082**	**3082**
Cypress Knolls										
1.8	0	0	819	253.8	0	0	0	819	1072.8	1072.8
2.4	0	0	204	74.4	0	0	0	204	278.4	278.4
1.0	0	0	0	60	0	0	0	0	60	60
	0	**0**	**1023**	**388.2**	**0**	**0**	**0**	**1023**	**1411.2**	**1411.2**
University Villages										
2.0	0	370	114	0	0	0	370	484	484	484
3.0	0	207	171	0	0	0	207	378	378	378
3.0	0	300	45	0	0	0	300	345	345	345
3.0	0	348	45	0	0	0	348	393	393	393
1.5	0	372	156	0	0	0	372	528	528	528
1.5	0	208.5	0	0	0	0	208.5	208.5	208.5	208.5
1.5	0	36	0	0	0	0	36	36	36	36
2.0	0	216	0	0	0	0	216	216	216	216
	0	**2057.5**	**531**	**0**	**0**	**0**	**2057.5**	**2588.5**	**2588.5**	**2588.5**
TAMC TOD										
2.8	0	279	279	0	0	0	279	558	558	558
	0	**279**	**279**	**0**	**0**	**0**	**279**	**558**	**558**	**558**
Existing										
2.6	0	83.2	0	0	0	0	83.2	83.2	83.2	83.2
2.6	0	52	0	0	0	0	52	52	52	52
2.6	0	54.6	0	0	0	0	54.6	54.6	54.6	54.6
	0	**189.8**	**0**	**0**	**0**	**0**	**189.8**	**189.8**	**189.8**	**189.8**

Marina Station	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
2.8	0	0	410.13	0	0	0	0	410.13	410.13	410.13
2.8	0	0	1590.3	276.21	0	0	0	1590.3	1866.51	1866.51
2.8	0	0	1590.3	217.62	0	0	0	1590.3	1807.92	1807.92
	0	**0**	**3590.73**	**493.83**	**0**	**0**	**0**	**3590.73**	**4084.56**	**4084.56**

Marina Central	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
2.8	0	507.78	465.93	0	0	0	507.78	973.71	973.71	973.71
2.8	0	25.2	67.2	0	0	0	25.2	92.4	92.4	92.4
2.8	0	0	2232	2232	2232	0	0	2232	4464	6696
	0	**532.98**	**2765.13**	**2232**	**2232**	**0**	**532.98**	**3298.11**	**5530.11**	**7762.11**

Monterey County	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
East Garrison I																								
Market Rate	MCO	SF Residential (< 5 units / acre)	Dwelling Units		0	0	37	171	289	308	189	56												
Affordable	MCO	SF Residential (5-8 units / acre)	Dwelling Units		0	0	8	43	97	144	105	23	0	0	0	0								
Monterey Horse Park	MCO	SF Residential (5-8 units / acre)	Dwelling Units					330	330	283														

CSUMB	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
CSUMB Housing	CSU/MAR	Multi family (> 15 units / acre)	Dwelling Units						95	95	95	95	48	48	48	48	48	48	48	48				

UCMBEST	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
UC 8th Street	UC/MCO	Multi family (> 15 units / acre)	Dwelling Units				33	33	33	33	33	33	33	33	33	33								
UC East Campus - SF	UC/MCO	SF Residential (< 5 units / acre)	Dwelling Units							67					67	66								
UC East Campus - MF	UC/MCO	Multi family (> 15 units / acre)	Dwelling Units																					

Del Rey Oaks	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
New Residential																								
Del Rey Oaks																								
Golf Villas	DRO	SF Residential (< 5 units / acre)	Dwelling Units				37	13																
Patio Homes	DRO	SF Residential (< 5 units / acre)	Dwelling Units				32	4																
Condos	DRO	Multi family (> 15 units / acre)	Dwelling Units				40	160	176															
Workforce	DRO	Multi family (> 15 units / acre)	Dwelling Units					70	68															
Townhomes/Senior Casitas	DRO	SF Residential (5-8 units / acre)	Dwelling Units				21	40	30															

US Army	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Residential																								
Doe Park (Stilwell) Single Family	ARMY	SF Residential (5-8 units / acre)	Dwelling Units	146			20				48						-20							
Doe Park (Stilwell) Duplex	ARMY	SF Residential (5-8 units / acre)	Dwelling Units	138			20				47						-20							

Seaside	Jurisd	Land Use	Units	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Residential																								
Seaside Resort Housing	SEA	SF Residential (< 5 units / acre)	Dwelling Units		1			9	10	10	95													
Seaside Housing (Eastside)	SEA	SF Residential (5-8 units / acre)	Dwelling Units																	110	110	110	110	110
Seaside Affordable Housing Obligations	SEA	Residential (8-15 units / acre)	Dwelling Units			36	36																	
Workforce Housing (Army to Build)	SEA	Residential (8-15 units / acre)	Dwelling Units							26														
Market Rate Housing (Army to Build)	SEA	SF Residential (< 5 units / acre)	Dwelling Units							150														
State Parks Housing (Workforce housing)	SEA	SF Residential (5-8 units / acre)	Dwelling Units																					
Workforce Housing (Seaside)	SEA	SF Residential (5-8 units / acre)	Dwelling Units				29		0	0														
Monterey Horse Park	SEA	SF Residential (5-8 units / acre)	Dwelling Units											97	100	100	100	100	100	100	100	100	100	100
Seaside Housing (Eucalyptus)	SEA	SF Residential (5-8 units / acre)	Dwelling Units														190	190	190	190	182			

Marina Coast Water District 2010 Urban Water Management Plan
Table C5: Population Growth Projection Details

Multiplier	Incremental Increase					Cumulative Increase				
East Garrison	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
2.1	0	1019	1134	0	0	0	1019	2153	2153	2153
2.1	0	304	558	0	0	0	304	862	862	862
3.0	0	1980	849	0	0	0	1980	2829	2829	2829
	0	**3303**	**2541**	**0**	**0**	**0**	**3303**	**5844**	**5844**	**5844**
CSUMB	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
3.0	0	285	1143	720	144	0	285	1428	2148	2292
	0	**285**	**1143**	**720**	**144**	**0**	**285**	**1428**	**2148**	**2292**
UC MBEST	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
2.6	0	257.4	429	171.6	0	0	257.4	686.4	858	858
2.6	0	0	174.2	345.8	0	0	0	174.2	520	520
2.6	0	0	0	0	0	0	0	0	0	0
	0	**257.4**	**603.2**	**517.4**	**0**	**0**	**257.4**	**860.6**	**1378**	**1378**
Del Rey Oaks	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
3.5	0	175	0	0	0	0	175	175	175	175
3.0	0	108	0	0	0	0	108	108	108	108
1.8	0	676.8	0	0	0	0	676.8	676.8	676.8	676.8
2.5	0	345	0	0	0	0	345	345	345	345
2.0	0	182	0	0	0	0	182	182	182	182
	0	**1486.8**	**0**	**0**	**0**	**0**	**1486.8**	**1486.8**	**1486.8**	**1486.8**
Army	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
3.0	876	60	144	-60	0	876	936	1080	1020	1020
3.0	828	60	141	-60	0	828	888	1029	969	969
	1704	**120**	**285**	**-120**	**0**	**1704**	**1824**	**2109**	**1989**	**1989**
Seaside	**2010**	**2015**	**2020**	**2025**	**2030**	**2010**	**2015**	**2020**	**2025**	**2030**
3.0	0	60	315	0	0	0	60	375	375	375
3.0	0	0	0	0	1650	0	0	0	0	1650
3.0	0	216	0	0	0	0	216	216	216	216
3.0	0	0	78	0	0	0	0	78	78	78
3.0	0	0	450	0	0	0	0	450	450	450
3.0	0	0	0	0	0	0	0	0	0	0
3.0	0	87	0	0	0	0	87	87	87	87
3.0	0	0	291	1500	1500	0	0	291	1791	3291
3.0	0	0	0	1710	1116	0	0	0	1710	2826
	0	**363**	**1134**	**3210**	**4266**	**0**	**363**	**1497**	**4707**	**8973**
Total	**1,704**	**9,792**	**15,184**	**7,759**	**6,642**	**1,704**	**11,496**	**26,680**	**34,439**	**41,081**

Table C6: Projected Demands by Source, Minimum Recycled Use (AFY)

	Total Demands by Jurisdiction	2010	2015	2020	2025	2030	SVGB Allocation	RW Allocation
Ord	CSUMB	403	441	631	754	778	1,035	87
	Del Rey Oaks	0	326	527	527	527	243	280
	City of Monterey	0	0	92	92	92	65	
	County of Monterey	4	627	1,087	1,087	1,087	710	134
	UCMBEST	2	93	276	474	474	230	60
	City of Seaside	792	1,130	1,351	1,664	2,093	1,012	453
	U.S. Army	752	792	838	997	997	1,577	
	State Parks and Rec.	0	12	18	20	25	45	
	Marina Ord Comm.	281	812	1,537	1,738	1,739	1,325	345
	Marina Sphere	10	10	10	10	10	10	
	FORA Strategic Res.	0	0	0	0	0	0	
	Assumed Line Loss	348	348	348	348	348	348	68
Marina	Armstrong Ranch	0	0	550	680	680	920	
	RMC Lonestar	0	0	0	0	500	500	
	Marina Central	1,962	2,208	2,630	2,723	2,724	3,320	
	Subtotal - Ord	2,592	4,591	6,715	7,712	8,172	6,600	1,427
	Subtotal - Marina	1,962	2,208	3,181	3,402	3,903	4,740	0
	Total	4,554	6,799	9,896	11,114	12,075	11,340	1,427

Recycled Water Demand (1,2)	2010	2015	2020	2025	2030	RW BODR Demands Phase 1	Phase 2
CSUMB	0	87	87	87	87	202	109
Del Rey Oaks	0	83	280	280	280	338	
City of Monterey	0	0	0	0	0		
County of Monterey	0	0	134	134	134	47	614
UCMBEST	0	10	60	60	60	55	
City of Seaside	0	400	453	453	453	806	140
U.S. Army	0	0	0	0	0		38
State Parks and Rec.	0	0	0	0	0		5
Marina Ord Comm.	0	200	345	345	345	435	391
Marina Sphere	0	0	0	0	0		
FORA Strategic Res.							
Assumed Line Loss							
Armstrong Ranch	0	0	0	0	0		
RMC Lonestar	0	0	0	0	0		
Marina Central	0	0	0	0	0	52	87

Groundwater Demand (3)	2010	2015	2020	2025	2030	Remaining GW
CSUMB	403	354	544	667	691	344
Del Rey Oaks	0	243	243	243	243	0
City of Monterey	0	0	65	65	65	0
County of Monterey	4	627	710	710	710	0
UCMBEST	2	83	216	230	230	0
City of Seaside	792	730	898	1,012	1,012	0
U.S. Army	752	792	838	997	997	580
State Parks and Rec.	0	12	18	20	25	20
Marina Ord Comm.	281	612	1,192	1,325	1,325	0
Marina Sphere	10	10	10	10	10	0
FORA Strategic Res.	0	0	0	0	0	0
Assumed Line Loss	348	348	348	348	348	0
Armstrong Ranch	0	0	550	680	680	240
RMC Lonestar	0	0	0	0	500	0
Marina Central	1,962	2,208	2,630	2,723	2,724	596

1,780 total unused

Demand by Source	2010	2015	2020	2025	2030
Groundwater	4,554	6,019	8,262	9,030	9,560
Recycled Water	0	780	1,359	1,359	1,359
Desalinated Water (4)	0	0	275	725	1,156

Notes:

1 2015 value = maximum of Phase 1 allocation or BODR Phase 1 existing demand
2 Assumes only Recycled Phase 1 occurs
3 Maximum of projected potable demand or SVGB allocation
4 Desalinated demand is total minus groundwater and recycled

Table C7: Projected Demands by Source, Maximum Recycled Use (AFY)

	Total Demands by Jurisdiction	2010	2015	2020	2025	2030	SVGB Allocation	RW Allocation
Ord	CSUMB	403	441	631	754	778	1,035	87
	Del Rey Oaks	0	326	527	527	527	243	280
	City of Monterey	0	0	92	92	92	65	
	County of Monterey	4	627	1,087	1,087	1,087	710	134
	UCMBEST	2	93	276	474	474	230	60
	City of Seaside	792	1,130	1,351	1,664	2,093	1,012	453
	U.S. Army	752	792	838	997	997	1,577	
	State Parks and Rec.	0	12	18	20	25	45	
	Marina Ord Comm.	281	812	1,537	1,738	1,739	1,325	345
	Marina Sphere	10	10	10	10	10	10	
	FORA Strategic Res.	0	0	0	0	0	0	
	Assumed Line Loss	348	348	348	348	348	348	68
Marina	Armstrong Ranch	0	0	550	680	680	920	
	RMC Lonestar	0	0	0	0	500	500	
	Marina Central	1,962	2,208	2,630	2,723	2,724	3,320	
	Subtotal - Ord	2,592	4,591	6,715	7,712	8,172	6,600	1,427
	Subtotal - Marina	1,962	2,208	3,181	3,402	3,903	4,740	0
	Total	4,554	6,799	9,896	11,114	12,075	11,340	1,427

Recycled Water Demand (1,2)	2010	2015	2020	2025	2030	RW BODR Demands Phase 1	Phase 2
CSUMB	0	87	87	311	311	202	109
Del Rey Oaks	0	83	280	338	338	338	
City of Monterey	0	0	0	0	0		
County of Monterey	0	0	134	661	661	47	614
UCMBEST	0	10	60	60	60	55	
City of Seaside	0	400	453	500	946	806	140
U.S. Army	0	0	0	38	38		38
State Parks and Rec.	0	0	0	5	5		5
Marina Ord Comm.	0	200	345	462	462	435	391
Marina Sphere	0	0	0	0	0		
FORA Strategic Res.							
Assumed Line Loss							
Armstrong Ranch	0	0	0	0	0		
RMC Lonestar	0	0	0	0	0		
Marina Central	0	0	0	139	139	52	87

Groundwater Demand (3)	2010	2015	2020	2025	2030	Remaining GW
CSUMB	403	354	544	443	467	568
Del Rey Oaks	0	243	243	189	189	54
City of Monterey	0	0	65	65	65	0
County of Monterey	4	627	710	426	426	284
UCMBEST	2	83	216	230	230	0
City of Seaside	792	730	898	1,012	1,012	0
U.S. Army	752	792	838	959	959	618
State Parks and Rec.	0	12	18	15	20	25
Marina Ord Comm.	281	612	1,192	1,276	1,277	48
Marina Sphere	10	10	10	10	10	0
FORA Strategic Res.	0	0	0	0	0	0
Assumed Line Loss	348	348	348	348	348	0
Armstrong Ranch	0	0	550	680	680	240
RMC Lonestar	0	0	0	0	500	0
Marina Central	1,962	2,208	2,630	2,584	2,585	735

2,571 total unused

Demand by Source	2010	2015	2020	2025	2030
Groundwater	4,554	6,019	8,262	8,237	8,769
Recycled Water	0	780	1,359	2,514	2,960
Desalinated Water (4)	0	0	275	363	346

Notes:

1 2015 value = maximum of Phase 1 allocation or BODR Phase 1 existing demand
2 Assumes Recycled Phase 2 occurs in 2021-2025, totals 3,000 afy
3 Maximum of projected potable demand or SVGB allocation
4 Desalinated demand is total minus groundwater and recycled

Appendix D: Notices and Letters to Public Agencies

The following notices and mailings were prepared during the development of this Urban Water Management Plan, and are included in this appendix.

1. Demand Projection Review to Cities, dated July 27, 2010 (sample letter and mailing list)
2. 60-day Notice to Cities and Agencies, dated January 31, 2011 (sample letter and mailing list)
3. Initial Notice on MCWD Website, www.mcwd.org
4. Public Notice of Plan availability for review, dated March 21, 2011
5. Transmittal of Draft to Cities and Agencies, dated January 31, 2011 (sample letter and mailing list)
6. MCWD Board Agenda and Staff Report, April 12, 2011 meeting (Public Hearing)
7. Notice Letter X, dated Y
8. Final Plan posted on MCWD Website, www.mcwd.org
9. Transmittal Records

25th Anniversary Schaaf & Wheeler
1985 ~ 2010 Consulting Civil Engineers

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July 27, 2010

Ms. Christine di Iorio
City of Marina, Director of Community Development
209 Cypress Avenue
Marina, CA 93933

Subject: Marina Coast Water District Urban Water Management Plan 2010 Update

Dear Ms. di Iorio

Schaaf & Wheeler is preparing the Marina Coast Water District's 2010 Urban Water Management Plan (UWMP). These plans are prepared by water suppliers every five years. Existing and projected water demands are compared to existing and planned water supplies to ensure there is sufficient supply available. A preliminary task in this effort is to coordinate with the District's customer jurisdictions to determine projected population and water demands. The 2010 UWMP will need to account for existing and forecasted water demands by five-year increments through the year 2030.

Water demands are generally a function of the size (acreage/square footage) or number of units of a development, depending on the type of land use, and a water demand unit factor that corresponds to that use. For each type of land use, Demand = Size x Unit Factor. Using this concept, Schaaf & Wheeler has prepared a preliminary estimate of water demands by land use type and by jurisdiction through 2030 as follows:

- Existing demands are estimated from the District's 2009 water usage records for each jurisdictional area. (Potential future water savings through conservation will be accounted for in the UWMP.)
- For developments that have approved Specific Plans, the water demand factors and total water demand estimates have been taken from the respective Water Supply Assessments (WSAs) for these Specific Plan areas.
- For in-fill development under approved General Plans or Master Plans (e.g., the City of Marina, CSUMB), the District's standard water demand factors have been used with the in-fill land use projections provided by the jurisdiction. (The District's standard water demand factors are attached as Table 1 to this letter.)
- For most future development within the District's planning area, including all planned Fort Ord development though 2022, we have acquired the Fort Ord Reuse Authority's (FORA) latest annual growth forecast, which they use for CIP

planning. The projected developments, generally by square footage or units, are then multiplied by the appropriate unit demand factors.

- For areas not reflected in the Fort Ord Reuse Authority growth forecast (Central Marina, the Army and State Parks), the projected developments reflect the projection in the 2005 UWMP.

You will find attached to this letter several tables detailing the estimates of existing and projected water usage. The summary table categorizes demand estimates by jurisdiction. The 2005 demand summary is provided for reference. The more detailed tables for each jurisdiction show the projected development over the next 20-years, categorized by three types of land use: New Residential, Replacement of Existing Residential, and Non-Residential.

Please have the appropriate staff member(s) review the projected development for your jurisdiction, and report any discrepancies to us.

Please note that the FORA growth forecast only looks at planned development though the year 2022, while the UWMP must project demands through 2030. If a specific plan area was not fully reflected in the FORA forecast, you will need to add the remainder of that development in the 2023-2030 columns. Please pay careful attention to the projected development through years 2025 and 2030 since those in particular may be underestimated.

The 2010 UWMP is projected to be completed in January 2011, pending the California Department of Water Resources release of updated guidance on UWMP preparation. We would appreciate your prompt review of and feedback on the projected water use figures. Even if no discrepancies are noted, please respond within sixty (60) days so that the UWMP preparation can proceed as scheduled.

Feel free to contact either myself or Tim Nelson of our office at 831-883-4848, email asterbenz@swsv.com, for any questions regarding this matter. Thank you for your cooperation.

Best regards,

Schaaf & Wheeler

Andrew Sterbenz, PE

Senior Engineer

Attachments

Urban Water Management Plan – Jurisdictional POC's

City of Marina	Christine di Iorio City of Marina, Director of Community Development 209 Cypress Avenue Marina, CA 93933 Phone: (831) 884-1220 Fax: (831) 884-9654 Alternate POC: Doug Yount
City of Seaside	Diana Ingersoll, PE City of Seaside, Deputy City Manager 440 Harcourt Ave. Seaside, CA 93955 (831) 899-6736 Alternate POC: Tim O'Halloran, PE
City of Del Rey Oaks	Daniel Dawson City of Del Rey Oaks, City Manager 650 Canyon Del Rey Road Del Rey Oaks, CA 93940 Phone: 831-394-8511 Fax: 831-394-6421 Alternate POC:
City of Monterey	Tom Reeves, PE City of Monterey, City Engineer, 580 Pacific Street, Room 7 Monterey, CA 93940 831.646.3448 Fax: 831.646.3405 REEVES@ci.monterey.ca.us Alternate POC: Kim Cole, Principal Planner
County of Monterey	Jim Cook County of Monterey, Resource Management Agency, Redevelopment and Housing 168 West Alisal St., 3rd Floor Salinas, CA 93901 Phone (831) 755-5390 Fax (831) 755-5398 cookj@co.monterey.ca.us Alternate POC: Nick Nichols, PE
CSUMB	Kathleen Ventimiglia CSUMB, Director for Campus Planning and Development 100 Campus Center, CSU Monterey Bay Seaside CA 93955-8001

	(831) 582-4304 (831) 582-3729 kventimiglia@csumb.edu Alternate POC: Bob Brown, Director of Facilities
UCMBEST	Graham Bice Managing Director, UC MBEST Center 3239 Imjin Road, Suite 101 Marina. CA 93933 Phone: 831.582.1020 FAX: 831.582.1021 bice@ucmbest.org
US Army	Dennis Oaks Presidio of Monterey, Directorate of Public Works IMWE-POM-PWO Attn: Dennis Oaks PO Box 5004 Monterey, CA 93944-5004 Phone 831.242.6315 Fax 831.242.7019
State Parks	Ken Gray District Services Manager California State Parks 2211Garden Road Monterey, CA 93940 phone (831) 649-2862 fax (831) 647-6239 kgray@parks.ca.gov

MARINA COAST WATER DISTRICT

11 RESERVATION ROAD • MARINA, CA 93933-2099
Home Page: www.mcwd.org
TEL: (831) 384-6131 • FAX (831) 883-5995

January 31, 2011

Mr. Curtis Weeks, General Manager
Monterey County Water Resources Agency
893 Blanco Circle
Salinas, CA 93901

Dear Mr. Weeks:

The Marina Coast Water District (MCWD) is preparing an updated Urban Water Management Plan (UWMP) for submittal to the California Department of Water Resources, pursuant to the Urban Water Management Planning Act, as codified in the California Water Code Sections 10610-10656. The last UWMP was adopted in 2006.

The updated plan is currently being drafted. Your planning staff was previously contacted for review and input on the development and water demand projections for the planning period, which runs to the year 2030. Our anticipated schedule for public review and plan adoption is:

March 15, 2011	Publish public review draft of the UWMP
April 12, 2011	Conduct public hearing at the regularly scheduled MCWD Board meeting
April 15, 2011	Comment period closes
May 10, 2011	Adopt final UWMP at the regularly scheduled MCWD Board meeting

We will provide you a copy of the public review draft plan in March. We invite your input and comments on the UWMP. Please provide input to our consultant, Schaaf & Wheeler Consulting Civil Engineers, Attn: Andy Sterbenz, 3239 Imjin Road, Suite 129, Marina, CA, 93933. Andy may be contacted by phone at (831) 883-4848, or by e-mail at asterbenz@swsv.com. You may contact me by direct phone at (831) 883-5935, or e-mail grogers@mcwd.org.

Sincerely,

Gary Rogers
Associate Engineer

Urban Water Management Plan – Jurisdictional POC's

City of Marina	Mr. Anthony Altfeld, City Manager City of Marina 209 Cypress Avenue Marina, CA 93933
City of Seaside	Mr. Ray Corpuz, City Manager City of Seaside 440 Harcourt Ave. Seaside, CA 93955
City of Del Rey Oaks	Mr. Daniel Dawson, City Manager City of Del Rey Oaks 650 Canyon Del Rey Road Del Rey Oaks, CA 93940 Phone: 831-394-8511 Fax: 831-394-6421
City of Monterey	Mr. Fred Meurer, City Manager City of Monterey 580 Pacific Street Monterey, CA 93940
County of Monterey	Mr. Jim Cook County of Monterey, Resource Management Agency, Redevelopment and Housing 168 West Alisal St., 3rd Floor Salinas, CA 93901
MCWRA	Mr. Curtis Weeks, General Manager Monterey County Water Resources Agency 893 Blanco Circle Salinas, CA 93901
MRWPCA	Mr. Keith Israel, General Manager Monterey Regional Water Pollution Control Agency 5 Harris Court, Bldg D Monterey, CA 93940
CSUMB	Ms. Kathleen Ventimiglia CSUMB, Director for Campus Planning and Development 100 Campus Center, CSU Monterey Bay Seaside CA 93955-8001 (831) 582-4304

	(831) 582-3729 kventimiglia@csumb.edu Alternate POC: Bob Brown, Director of Facilities
UCMBEST	Mr. Graham Bice Managing Director, UC MBEST Center 3239 Imjin Road, Suite 101 Marina. CA 93933 Phone: 831.582.1020 FAX: 831.582.1021 bice@ucmbest.org
US Army	Ms. Christina Spang Presidio of Monterey, Directorate of Public Works IMWE-POM-PWO Attn: Christina Spang PO Box 5004 Monterey, CA 93944-5004
State Parks	Mr. Ken Gray, District Services Manager California State Parks 2211Garden Road Monterey, CA 93940
CalAm	Mr. Craig E. Anthony General Manager, Monterey District California American Water 511 Forest Lodge Road, Suite 100 Pacific Grove, CA 93950
MPWMD	Darby W. Fuerst Monterey Peninsula Water Management District 5 Harris Court, Bldg G Monterey, CA 93940
FORA	Michael A. Houlemard, Jr. Executive Officer, Fort Ord Reuse Authority 100 12th Street, Bldg 2880 Marina, CA 93933

MARINA COAST WATER DISTRICT

11 RESERVATION ROAD • MARINA, CA 93933-2099
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March 29, 2011

The Marina Coast Water District (MCWD) is preparing an updated Urban Water Management Plan (UWMP) for submittal to the California Department of Water Resources, pursuant to the Urban Water Management Planning Act, as codified in the California Water Code Sections 10610-10656. The last UWMP was adopted in 2006.

The updated plan is currently being drafted. The planning staffs of the Cities served by the District have been contacted for review and input on the development and water demand projections for the planning period, which runs to the year 2030. Our anticipated schedule for public review and plan adoption is:

April 15, 2011	Publish public review draft of the UWMP
May 10, 2011	Conduct public hearing at the regularly scheduled MCWD Board meeting
May 16, 2011	Comment period closes
June 14, 2011	Adopt final UWMP at the regularly scheduled MCWD Board meeting

The draft plan will available for review at the District Office. A pdf version of the draft plan will be posted on the District's website.

For additional information, please contact:

Gary Rogers, Marina Coast Water District, 831.883.5935
or
Andy Sterbenz, Schaaf & Wheeler, Consulting Civil Engineers, 831.883.4848

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Marina Coast
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Office Hours:
Monday - Friday
8:00 a.m. to 5:30 p.m.

Web Mail

The District is Preparing a Draft Updated Urban Water Management Plan for Public Review. For information regarding this update, click here.

For the District procurement schedule for consultants related to the Regional Desalination Project, click here.

MCWD Water Conservation Commission Volunteer Needed
If you are interested in serving your community and have an interest in our precious water resources, consider participating as a member of the Water Conservation Commission. Call 883-5928 or 883-5910 for information, or download the flyer (PDF).

Design a Water-Wise Garden
Click the image to visit the Water-Wise Gardening in Monterey County web site and use an interactive program to help you create your own water-wise landscape. Features include design ideas, photo galleries, plant lists, irrigation tips, and more! Plants were selected specifically for the Monterey

MCWD Wins Second Financial Excellence Award ... (PDF)

New Conservation Video ... Watch

Updated Landscape Watering Guide ... PDF

Hot Water Pump Rebate ... up to $250 ... Details

Draft Initial Study Well Replacement Project ... Details

Water-Wise Landscaping Incentives ... Details

Appendix E: Technical Memoranda

The following technical memoranda were prepared as interim reports during the development of this Urban Water Management Plan, and are included in this appendix.

1. Population Estimates Used for MCWD 2010 Urban Water Contingency Plan
2. MCWD Water Conservation Targets for UWMP
3. Water Shortage Contingency Plan Review

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TECHNICAL MEMORANDUM

TO:	Gary Rogers, MCWD Rich Youngblood, MCWD	DATE:	November 10, 2010
FROM:	Andrew Sterbenz, PE	JOB #:	MCWD.39.07.018
SUBJECT:	Population Estimates used for MCWD 2010 Urban Water Management Plan		

Purpose

The purpose of this memorandum is to summarize the methodology and source data used to develop annual population estimates for the two Marina Coast Water District service areas. These estimates are used to calculate per capita water usage rates, as required under the State's 20x2020 Water Conservation Plan. A ten-year average water consumption rate must be calculated for a period ending not earlier than December 31, 2004 and not later than December 31, 2010. This average rate will be used as the base, against which the year 2015 and 2020 goals will be established.

Methods

The Urban Water Use Target Technical Methodologies, prepared by the California Department of Water Resources, requires that water districts use annual population estimates for cities as the basis of their analysis, when possible. Where this is not possible, they recommend using the 2000 decennial census results by census block to determine the average population per connection within the district service area, and to then apply that population factor to the average number of connections for each year. As is explained below, these methods were modified to better estimate the population within the Ord Community, which was not accounted by connection prior to the District assuming operation of the system.

The U.S. Census Bureau conducts a decennial census in years ending in zero. The results from the 1990 and 2000 censuses were obtained from the Census bureau website, www.census.gov. The results of the 2010 census will not be available until April 2011. The decennial census data is available at the following levels: state, county, tract, block group, block and named place. Blocks are the smallest geographic data areas, block groups are aggregates of blocks, tracts are aggregates of block groups, and counties are aggregates of tracts. Named places (typically cities) are aggregates of blocks, which may or may not align with block groups and tracts.

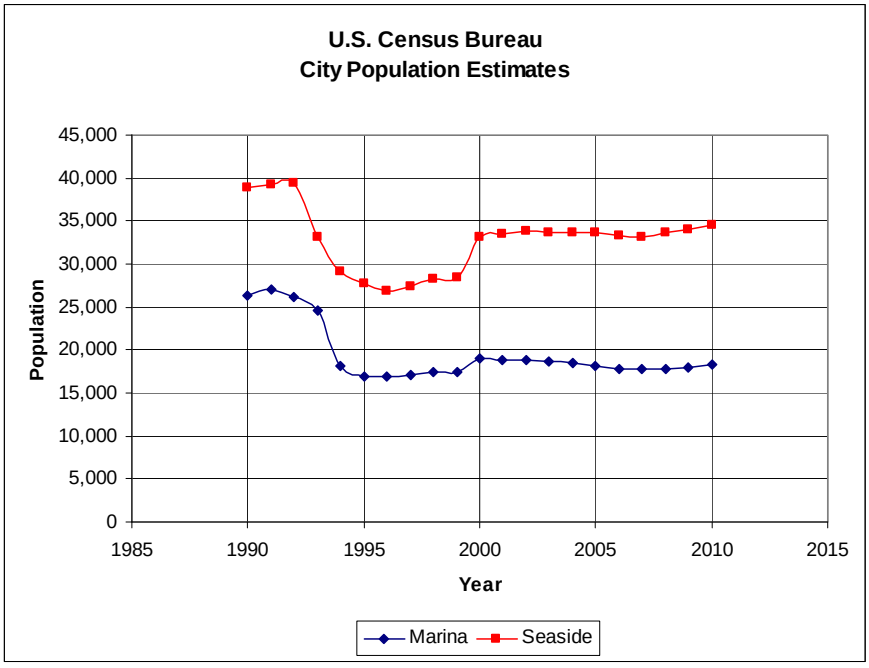
The District has two service areas, Central Marina and the Ord Community. Central Marina aligns with three census tracts: 142, 143.01 and 143.02. The Ord Community aligns with a

single census tract from the 1990 census, tract 141, which was divided into three tracts for the 2000 census, 141.01, 141.02 and 141.03. The clear division along census tract boundaries allows clean calculation of service area populations for the decennial census years. One unoccupied portion of the District service area south of South Boundary Road is within census tract 132. Future development is planned in tract 132 within Del Rey Oaks and the City of Monterey, but those areas can be omitted from estimates of current population. See Figure 1, Year 200 Census Tracts, attached.

There are two incorporated places within the District's service area, the City of Marina and the City of Seaside, with the balance of the service area in unincorporated Monterey County. The portion of Del Rey Oaks north of South Boundary Road was not included within its census boundary because that portion of Fort Ord was not occupied in the 1990 and 2000 census. The City of Marina includes all of tract 142, a portion of tract 141.01, and the occupied portions of tracts 141.02, 143.01 and 143.02. The City of Seaside includes portions of tracts 141.01 and 141.03. Seaside also includes tracts 135 to 139 and portions of 140, which are outside the District service area. Unincorporated Monterey County includes portions of tracts 141.01, 141.02 and 141.03. See the 1990 and 2000 Census Tract Maps, attached.

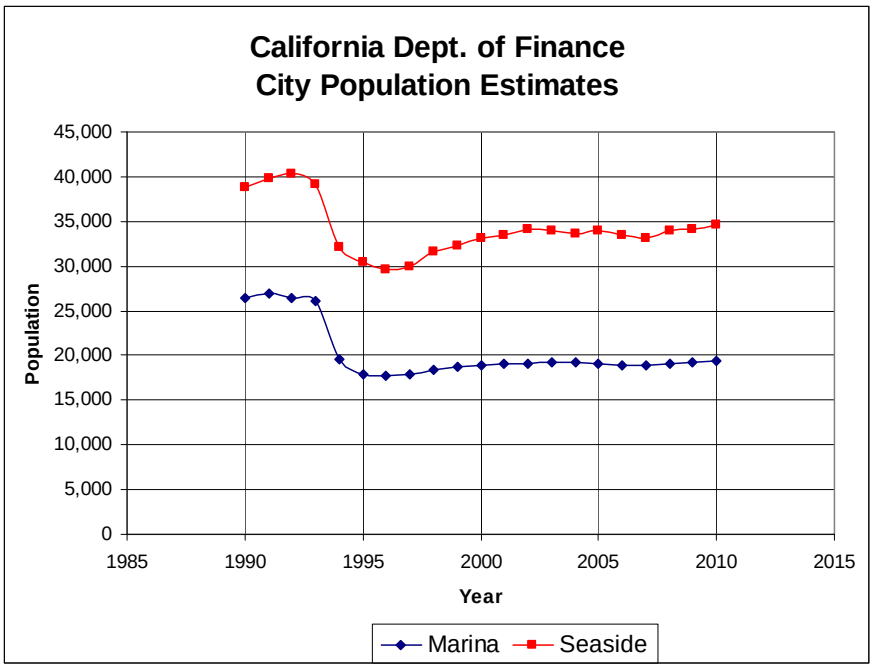
The U.S. Census Bureau prepares population estimates for states, counties and named places for the years between decennial censuses. These estimates are created annually for the preceding year, based upon a demographic model and the preceding census data. Estimates are not corrected to reflect the subsequent decennial census results. Census estimate tables SU-99-00 and SUB_EST2009 were obtained from the Census Bureau website. The Census Bureau also prepares projections of future population, but only to the state level. The population estimates for Marina and Seaside are graphed in Figure 2.

Figure 2



The California Department of Finance prepares future population projections by county and population estimates by named place for the current year. Department of Finance Estimate Table E-4 was obtained from the department website, http://www.dof.ca.gov, for the periods 1990-2000 and 2000-2010. These estimates for Marina and Seaside are graphed in Figure 3, and tabulated in Table 1 (attached). As can be seen, the Department of Finance estimates tracked to the decennial census results better than the U.S. Census Bureau estimates, so the Department of Finance estimates were used as the basis of estimating population for census tracts. The annual growth rates for each city, and the average growth rate for the combined Marina-Seaside population, were calculated in Table 1.

Figure 3



The closure of Fort Ord in 1994 accounts for the sudden population decline in 1993-1995. The military housing areas within Marina and Monterey County were unoccupied during the transition from military housing to affordable housing in Marina and campus housing within Monterey County. Military housing within Seaside declined in population, but remained occupied with families from the Presidio of Monterey and the Naval Post Graduate School. Both Marina and Seaside experienced an exodus of military residents who were assigned to Fort Ord but lived off-post in the civilian community.

By the time of the 2000 decennial census, those housing areas within the Ord Community that were to remain in use had been reoccupied, and CSUMB had completed their first phase of student dormitories. The Army had initiated a program of phased housing upgrades in the Presidio Annex but had a stable population. The Seaside Highlands housing area was being planned, but the other non-military residential areas within Seaside were occupied. Therefore, the 2000 census of the Ord Community is a valid baseline to estimate from.

To estimate the population of Central Marina between 1990 and 2000, the 1990 census tract populations were increased in years 1991-1993 using the Marina annual growth rate. The 2000 census populations for those tracts were then scaled backwards to estimate years 1995-1996.

The 1994 value is the mathematical average of the preceding and following years. This was necessary because the two estimating methods did not converge (the closure of Fort Ord skewed the growth rate as applicable to Central Marina).

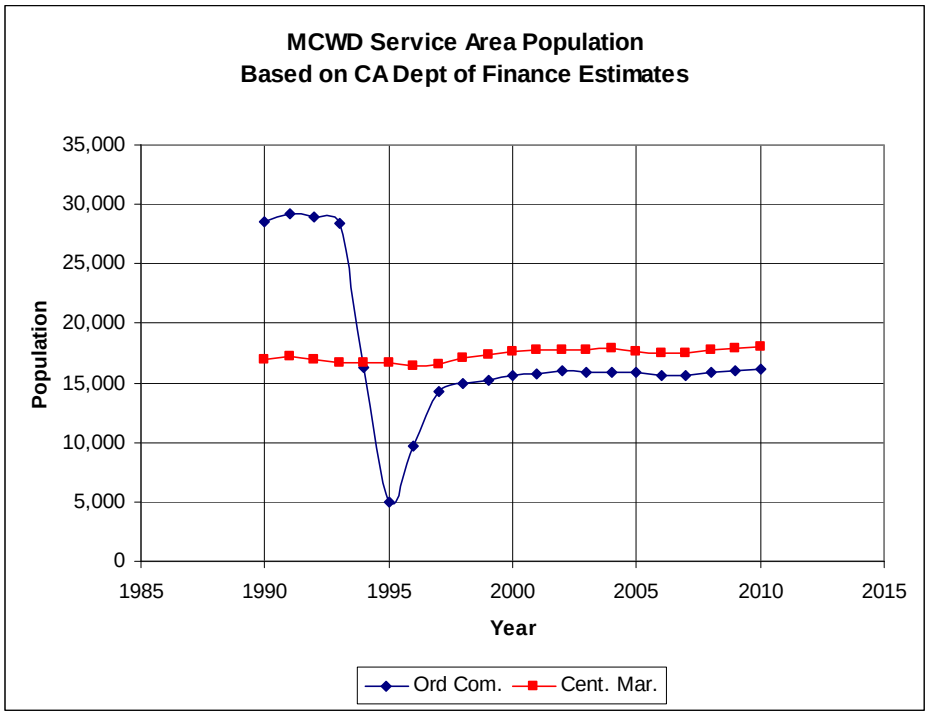
To estimate the population of the Ord Community between 1990 and 2000, the total population for 1990 census tract 141 was divided into the 2000 census tracts 141.01, 141.02 and 141.03. For the City of Marina, the population of tracts 142, 143.01 and 143.02 were subtracted from the city total, and the remainder was used as the population of tract 141.02. Similarly, the City of Seaside population outside the Ord Community was totaled and subtracted from the city total, and applied to tract 141.03. The remaining population for tract 141 was allocated to tract 141.01. These 1990 values were then increased in years 1991-1993 using the annual growth factors for Seaside in tract 141.03 and the combined growth factor in tract 141.01. Tract 141.01 is technically unincorporated Monterey County, but the combined growth rate for Marina-Seaside is considered more applicable for this area, which is only occupied within CSUMB. The population for tract 141.02 was calculated by estimating the Central Marina population, and subtracting it from the City of Marina estimate. Similarly, the 2000 census populations for those tracts were scaled backwards to estimate the populations in 1996-1999. To reflect the rapid decrease and recovery of the Ord Community population, estimated values were entered for 1995, based on the known change in residential uses and water usage reported for that year. The values for 1994 and 1996 are the mathematical averages of the preceding and following years.

To estimate the District population between 2000 and 2010, the growth rates for Marina and Seaside were applied to the 2000 census tracts, as follows. Tract 141.01 was scaled using the combined Marina-Seaside annual growth rate. Tract 141.03 was scaled using the Seaside annual growth rate. The three Marina census tracts were scaled up using the Marina annual growth rate to estimate the population of Central Marina. Tract 141.02 was calculated by subtracting the Central Marina estimate from the City of Marina estimate.

Results

Applying the annual growth rates from the Department of Finance as described above, the resulting population estimate is as shown in Figure 4, and in Table 1 (attached). Scaling the Central Marina population using the Department of Finance annual growth rate, and then entering the remainder in tract 141.02 may slightly overestimate the Central Marina service area population and under estimate the Ord Community, but this will not affect the calculation of average water usage rates across the entire system. Because the estimates for 1995 and 1996 are based on extrapolations, it is recommended they not be used in the 20x2020 water use estimates. Instead, the average water use should be based on a ten-year period beginning January 1, 1997, or later.

Figure 4



References

California Department of Finance website, www.dof.ca.gov, population estimate tables:

E-4 Historical Population Estimates for Cities, Counties and the State, 1991-2000, with 1990 and 2000 Census Counts

E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark

U.S. Census Bureau, American FactFinder website, www.census.gov

2000 Decennial Census Summary File 1 (SF1)

1990 Decennial Census Summary Tape File 1 (STF1)

Table SU-99-10, Population Estimates for States, Counties, Places, and Minor Civil Divisions: Annual Time Series, July 1, 1990 to July 1, 1999 (includes April 1, 1990 Population Estimates Base)

Table 4, Annual Estimates of the Resident Population for Incorporated Places in California: April 1, 2000 to July 1, 2009 (SUB-EST2009-04-06)

Census Tract Outline Map (Census 2000), Monterey County, CA, sheets CT06053_001, CT06053_C01, and CT06053_D01

1990 Census Tract/BNA Outline Map (Recreated), Monterey County, CA, sheets 90T06053_001 and 90T06053_C01

Urban Water Use Target Technical Methodologies, California Department of Water Resources, October 1, 2010

Attachments

Table 1: Estimate of MCWD Service Area Populations

Figure 1, Year 2000 U.S. Census Tracts, MCWD Service Area

Census Tract/BNA Outline Map (Census 1990, Recreated), sheet 90T06053_001

Census Tract Outline Map (Census 2000), sheet CT06053_001

Table 1: Estimate of MCWD Service Area Population

	CA DoF-Places			CA DoF-Growth Rates				Census Tracts									
Year	Marina	Seaside		Marina	Seaside	Combined		Ord Community				Central Marina			Total	Total	Total
								141	141.01	141.02	141.03	142	143.01	143.02	Ord Com.	Cent. Mar.	MCWD
1990	26,512	38,826		base	base	base		28,591	*3,550*	*9,519*	*15,522*	9,865	3,562	3,566	28,591	16,993	45,584
1991	26,929	39,812		1.016	1.025	1.021			3,626	9,669	15,855	10,020	3,618	3,622	29,150	17,260	46,411
1992	26,361	40,395		0.979	1.015	1.000			3,627	9,465	15,859	9,809	3,542	3,546	28,951	16,896	45,847
1993	26,146	39,217		0.992	0.971	0.979			3,551	9,388	15,528	9,729	3,513	3,517	28,467	16,758	45,225
1994	19,509	32,179		0.746	0.821	0.791			1,776	4,694	9,764	9,407	3,572	3,742	16,233	16,722	32,955
1995	17,968	30,483		0.921	0.947	0.937			500	500	4,000	9,086	3,632	3,968	5,000	16,685	21,685
1996	17,731	29,539		0.987	0.969	0.976			4,079	888	4,670	8,966	3,584	3,915	9,637	16,465	26,102
1997	17,861	30,009		1.007	1.016	1.013			7,658	1,275	5,340	9,032	3,610	3,944	14,273	16,586	30,859
1998	18,445	31,682		1.033	1.056	1.047			8,019	1,317	5,638	9,327	3,728	4,073	14,974	17,128	32,102
1999	18,663	32,347		1.012	1.021	1.018			8,160	1,332	5,757	9,438	3,772	4,121	15,249	17,331	32,580
2000	18,925	33,097		1.014	1.023	1.020			8,322	1,351	5,890	9,570	3,825	4,179	15,563	17,574	33,137
2001	19,077	33,536		1.008	1.013	1.011			8,417	1,362	5,968	9,647	3,856	4,213	15,747	17,715	33,462
2002	19,148	34,129		1.004	1.018	1.013			8,523	1,367	6,074	9,683	3,870	4,228	15,963	17,781	33,744
2003	19,174	33,888		1.001	0.993	0.996			8,488	1,369	6,031	9,696	3,875	4,234	15,888	17,805	33,693
2004	19,250	33,647		1.004	0.993	0.997			8,462	1,374	5,988	9,734	3,891	4,251	15,824	17,876	33,700
2005	19,030	33,962		0.989	1.009	1.002			8,477	1,358	6,044	9,623	3,846	4,202	15,880	17,672	33,551
2006	18,855	33,451		0.991	0.985	0.987			8,367	1,346	5,953	9,535	3,811	4,164	15,666	17,509	33,175
2007	18,838	33,183		0.999	0.992	0.995			8,322	1,345	5,905	9,526	3,807	4,160	15,572	17,493	33,065
2008	19,067	34,024		1.012	1.025	1.021			8,493	1,361	6,055	9,642	3,854	4,210	15,909	17,706	33,615
2009	19,224	34,175		1.008	1.004	1.006			8,542	1,372	6,082	9,721	3,885	4,245	15,996	17,852	33,848
2010	19,445	34,628		1.011	1.013	1.013			8,650	1,388	6,162	9,833	3,930	4,294	16,201	18,057	34,258

Notes:

1990 census tract 141 did not include the 3 block groups in the 2000 census. BG values estimated based on population for Marina and Seaside minus other BG's.

Tract 141.01: 1991-1993 scaled from 1990 value using combined growth rate. 1995 value assumed. 1994 and 1996 values average of 1995 and adjacent year. 1997-2010 scaled from 2000 value.

Tract 141.02: 1991-1993 and 1997-2010 are the City of Marina population minus Central Marina. 1995 value assumed. 1994 and 1996 values average of 1995 and adjacent year.

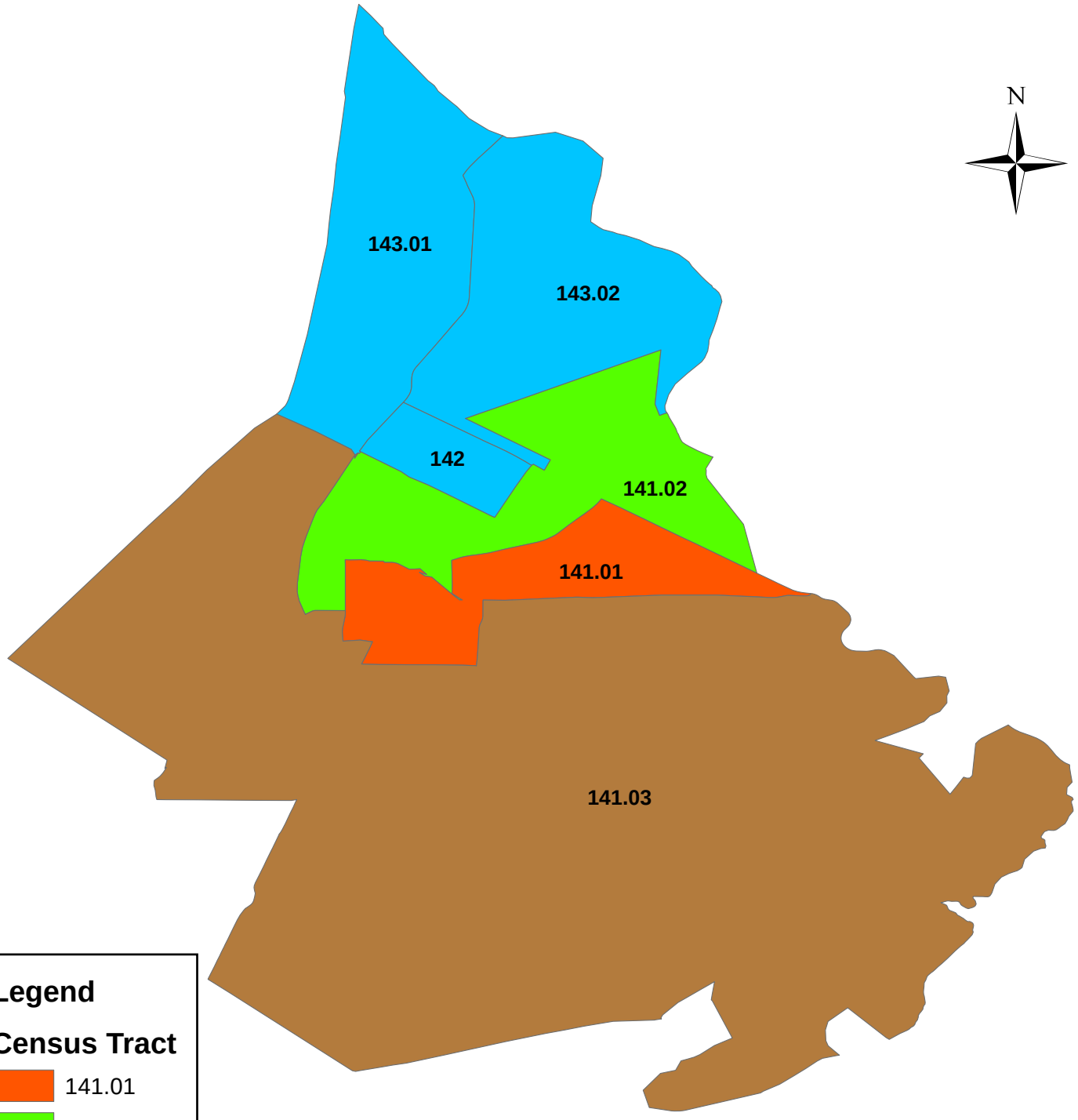
Tract 141.03: 1991-1993 scaled from 1990 value using Seaside growth rate. 1995 value assumed. 1994 and 1996 values average of 1995 and adjacent year. 1997-2010 scaled from 2000 value.

Tract 142: 1991-1993 scaled from 1990 value using Marina growth rate. 1997-2010 scaled from 2000 value. 1995 value is average of 1994 and 1996 values.

Tract 143.01: 1991-1993 scaled from 1990 value using Marina growth rate. 1997-2010 scaled from 2000 value. 1995 value is average of 1994 and 1996 values.

Tract 143.02: 1991-1993 scaled from 1990 value using Marina growth rate. 1997-2010 scaled from 2000 value. 1995 value is average of 1994 and 1996 values.

Figure 1: Year 2000 U.S. Census Tracts, MCWD Service Area



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TECHNICAL MEMORANDUM

TO:	Gary Rogers and Rich Youngblood, MCWD	DATE:	February 16, 2011
FROM:	Andrew Sterbenz, PE	JOB #:	MCWD.39.07.018
SUBJECT:	MCWD Water Conservation Targets for UWMP		

The purpose of this memorandum is to discuss the calculation and selection of water conservation targets for the 2010 Urban Water Management Plan, as required by the Water Conservation Act of 2009 (SBx7-7). Commonly called the 20x2020 plan, this legislation established a statewide goal of reducing urban water per capita water demands by 20 percent by the year 2020.

An urban retail water supplier must set a 2020 water use target and a 2015 interim target using one of four methods. Three of these are defined in Section 10608.20(a)(1) of the Water Code, with the fourth to be developed by the California Department of Water Resources (DWR) by the end of 2010. The 2020 water use target must be calculated using one of the following four methods:

- Method 1: Eighty percent of the water supplier's *baseline per capita water use*.
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use; landscaped area water use; and commercial, industrial, and institutional uses.
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's April 30, 2009, draft 20x2020 Water Conservation Plan.
- Method 4: An approach developed by DWR and reported to the Legislature by December 31, 2010. The proposed method uses conservation Best Management Practices (BMP) as prescribed by the California Urban Water Conservation Council (CUWCC)

A maximum conservation target, regardless of method used, is also defined as discussed below.

Gross water use is calculated as the total water entering the system minus wholesale water deliveries leaving the system. The District does not purchase or provide wholesale water, so this is simply the total well pumping for the period. Water suppliers may deduct from this total (1) recycled water use, (2) industrial process water use, and (3) agricultural irrigation use. None of these deductions currently apply to the District.

Baseline per capita water use is calculated as the gross water use for a year divided by the average population during that year. Years may be defined by the water supplier as calendar

year, fiscal year, or another 12-month reporting period. The water supplier will submit future compliance reports using the same reporting year. We recommend using calendar year because that is used for well pumping reporting to Monterey County Water Resources Agency (MCWRA) and for BMP Reporting to the CUWCC. Population estimates for the District service areas were previously submitted in a technical memorandum dated November 10, 2010. A ten-year average water consumption rate must be calculated for a period ending not earlier than December 31, 2004 and not later than December 31, 2010. The attached table shows population and water use by service area for the years 1995 to 2010, and the resulting 10-year average demand rates for periods ending in 2004 to 2010. If the baseline demand were less than 100 gallons per capita per day (gpcd), no additional conservation reduction would be required.

Conservation targets must be established choosing a representative year from the seven possible years (2004-2010), and using one of the four methods. As discussed in the Population Technical Memorandum, we recommend against using the periods ending in 2004 and 2005 due to the population variations that occurred in 1995 and 1996 due to the closure of Fort Ord. We recommend using the median value of 118.6 gpcd as the District baseline, from the period ending December 31, 2008. After calculating targets using the four methods, the targets are compared to the minimum water conservation target required under Section 10608.22 of the Water Code.

Method 1: The 2020 water demand target is 80% of the baseline demand (118.6 gpcd). This method yields a target of 94.9 gpcd.

Method 2: This method consists of establishing separate water demand targets for indoor water use, landscape water use and commercial, industrial and institutional (CII) water use. The indoor residential demand target is established in the legislation as 55 gpcd. Landscape water demand must meet the requirements of the Model Water Efficient Landscape Ordinance. CII water demand targets may be set at 10% below the baseline demand. In order to apply this method, detailed information is required for all irrigated landscapes (area, date installed, vegetation type, and metered or estimated water use). Because we did not have this level of data available, this method was not used.

Method 3: The 2020 water demand target is 95% of the hydrologic region target. The District is in Region 3, Central Coast, which already has the lowest per capita water demand in the state. In the 20x2020 Water Conservation Plan, the baseline demand for the Region 3 was calculated as 154 gpcd, and the 2020 urban water use target is 123 gpcd. The Method 3 target is 95% of 123 gpcd, or 116.9 gpcd.

Method 4: This method is still being developed by DWR. The proposed draft method is based upon estimating conservation savings using the CUWCC BMPs. The advantage of this method is that the CUWCC annual reports for 2015 and 2020 will serve as the interim and final compliance reports to DWR. Water savings calculator (workbook) is used to estimate the potential savings from programs targets at indoor, outdoor and commercial, industrial and institutional (CII) use sectors. As with Method 2, additional data will be required to use this method. Specifically, landscape irrigation demands must be segregated from residential and CII demands. Because this level of information was not available, we did not calculate targets under this method.

Maximum Conservation Target: This method consists of calculating a five-year average water consumption rate for a period ending not earlier than December 31, 2007 and not later than December 31, 2010. These results are tabulated below. The 2020 conservation target must be less than or equal to 95% of the 5-year base daily per capita usage, which would be 110.8 gpcd for the recommended baseline period ending December 31, 2008.

Table 1: 10-year and 5-year Baseline Demands

Year Ending Dec 31	10-year Average Demand	2020 Target = 80%	5-year Average Demand	Maximum 2020 Target
	(gpcd)	(gpcd)	(gpcd)	(gpcd)
2004	133.0	106.4		
2005	124.3	99.4		
2006	120.0	96.0		
2007	118.7	95.0	117.8	111.9
* 2008	118.6	94.9	116.7	110.8
2009	116.6	93.3	113.1	107.5
2010	115.0	92.0	112.4	106.8

* recommended baseline year

Using Method 1, the District may select any of the values from the 80% target column in Table 1. All of these meet the minimum 5% reduction requirement of the Water Conservation Act. Using Method 3, the target of 116.9 gpcd exceeds the required 5% minimum reduction, so the target is adjusted to be 110.8 gpcd (for the baseline period ending December 31, 2008). Using Method 3 allows the District to take credit for its ongoing aggressive water conservation efforts, without imposing additional customer restrictions.

We recommend that the District use the period ending December 31, 2008 as its baseline period, and that it use Method 3 to establish it conservation targets. This will result in a 2020 conservation target of 110.8 gpcd, and a 2015 interim target of 114.7 gpcd (equals the midpoint between the 2008 10-year average and the 2020 target).

References

Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, California Department of Water Resources, October 2010

20x2020 Water Conservation Plan, California Department of Water Resources, February 2010

Attachments

Baseline Per Capita Water Demand Table

Per Capita Use

	Marina System				Ord System				System-Wide	System-Wide	10-year		5-year	Maximum
Year	Marina Pop.	Water Use (af)	Annual Per Capita (gals)	Daily Per Capita (gals)	Ord Pop.	Water Use (af)	Annual Per Capita (gals)	Daily Per Capita (gals)	Annual Per Capita (gals)	Daily Per Capita (gals)	Average End Yr (gpcd)	2020 Goal (gpcd)	Average End Yr (gpcd)	2020 Goal (gpcd)
1990	16,993		0	0	28,591		0	0	0	0				
1991	17,260		0	0	29,150		0	0	0	0				
1992	16,896		0	0	28,951		0	0	0	0				
1993	16,758		0	0	28,467		0	0	0	0				
1994	16,722		0	0	16,233		0	0	0	0				
1995	16,685	2,018	39,410	108	5,000	2,802	182,607	500	72,427	198				
1996	16,465	2,119	41,936	115	9,637	2,490	84,196	231	57,538	158				
1997	16,586	2,147	42,180	116	14,273	2,574	58,763	161	49,850	137				
1998	17,128	1,860	35,385	97	14,974	2,086	45,394	124	40,054	110				
1999	17,331	2,241	42,144	115	15,249	2,396	51,190	140	46,378	127				
2000	17,574	2,300	42,643	117	16,239	2,371	47,584	130	45,016	123				
2001	17,715	2,285	42,029	115	15,747	2,228	46,105	126	43,948	120				
2002	17,781	2,306	42,263	116	15,963	2,137	43,612	119	42,901	118				
2003	17,805	2,185	39,995	110	15,888	2,144	43,977	120	41,873	115				
2004	17,876	2,262	41,227	113	15,824	2,423	49,892	137	45,296	124	133.0	106.4		
2005	17,672	2,195	40,466	111	15,880	1,994	40,908	112	40,675	111	124.3	99.4		
2006	17,509	1,786	33,247	91	15,666	2,509	52,182	143	42,188	116	120.0	96.0		
2007	17,493	1,622	30,216	83	15,572	2,941	61,540	169	44,968	123	118.7	95.0	117.8	111.9
2008	17,706	1,833	33,740	92	15,909	2,269	46,470	127	39,765	109	118.6	94.9	116.7	110.8
2009	17,852	1,962	35,806	98	15,996	2,076	42,291	116	38,871	106	116.6	93.3	113.1	107.5
2010	18,057	1,743	31,461	86	16,201	2,389	48,053	132	39,308	108	115.0	92.0	112.4	106.8

Note: Water use from MCWD records (differs from MCWRA Annual GW Report)

Note: Population uses scaled DOF estimates

Note: DWR methodology calculates 10-year average as the mean of annual gpcd

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TECHNICAL MEMORANDUM

TO:	Gary Rogers and Rich Youngblood, MCWD	DATE:	December 14, 2010
FROM:	Andrew Sterbenz, PE	JOB #:	MCWD.39.07.018
SUBJECT:	Water Shortage Contingency Plan		

The purpose of this memorandum is to discuss the District's Water Shortage Contingency Plan (WSCP) and to recommend updates for inclusion in the 2010 Urban Water Management Plan (UWMP).

We have reviewed the District's WSCP, adopted May 25, 2005, as included in the 2005 UWMP, with respect to the requirements of Water Code Section 10632. We recommend submitting an updated plan to the Board of Directors for approval. Several of the recommended changes are project updates and tense changes. For example, the 2005 WSCP discusses the interconnection of the Marina and Ord systems in the future tense. These systems are now connected and consolidated into a single public water system permit. Another item is the table summarizing revenue impacts of reduced water sales, which should be updated to reflect current energy prices. A draft update to the WSCP is attached.

A significant update is recommended to meet the requirements of Water Code Section 10632(d). Water Shortage Contingency Plans are required to include "additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning." As currently written, the plan emphasizes the District's Mandatory Restrictions on Water Waste (Code of Ordinances, section 3.36.030), which are always in effect, but does not add any additional restrictions as a means of reducing water use. A list of available water use reduction methods is included for voluntary adoption, but it will require a Board action at the time of the water shortage to make these restrictions mandatory. Considering the reliability of the District's source of supply (Salinas Valley Groundwater Basin), it is unlikely that the District will progress through Conservation Stages 1 through 5 in order. It is more likely that a mechanical failure or seismic event will leave a portion of the system temporarily inoperable, placing the District immediately into Stage 3, 4 or 5. Adding specific reduction measures to be taken at each mandatory stage will enable staff to quickly prepare and issue public information and instructions if a shortage occurs. The Board may still modify the required restrictions at the time of the event.

The District's five Conservation Stages and triggers are tabulated below:

Conservation Stage and Shortage Level	Triggering Mechanism
Stage One 0-10% Voluntary	1) system malfunction resulting in up to 10% shortage 2) increase in chlorides which do not threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending
Stage Two >10-25% Voluntary	1) system malfunction resulting in greater than10% shortage 2) increase in chlorides which may threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending
Stage Three >25-35% Mandatory	1) system malfunction resulting in greater than 25% shortage 2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced by up to 25%
Stage Four >35-50% Mandatory	1) system malfunction resulting in greater than 35% shortage 2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced more than 35%
Stage Five >50% Mandatory	1) system malfunction resulting in greater than 50% shortage 2) increase in chlorides which may threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards or when remaining capacity is reduced more than 50%

Listed below are suggested water use restrictions to implement during Conservation Stages 3, 4 and 5. These are based on the priorities for use listed in the Water Code, Chapter 3, which are (1) health and safety, (2) commercial, industrial and government use, (3) existing landscaping and (4) new demands. The measures are taken from Drought Management Plans from other municipalities. We have intentionally omitted any measure which would restrict water for a business use (e.g., vehicle washing in driveways is restricted but commercial car washes are not). The City of San Antonio, TX, drought management plan is attached for reference. This list is intended as a starting point for discussion and not as a final list for board approval. Per the current WSCP, Conservation Stages 1 and 2 are voluntary reductions requiring public information efforts, so they are not included.

Additionally, there are several actions listed in the current WSCP that we recommend removing. Under Stage 3, the fourth action on the list reads "No building permits will be issued or meters installed for new accounts that had not received building permits before the "Severe Shortage" was declared." Under Mandatory Provisions on Water Waste, the final three options read, "f) elimination of the issuance of construction meters, g) shut-off of dedicated landscape irrigation meters, and h) moratorium on provision of new supply meters". These options will result in financial impacts to the affected property or business owners (for landscape meters, only for golf courses or athletic venues), and may be considered punitive compared to the restrictions placed on other District customers.

Stage	Type Use	Restriction
3	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering using sprinkler or irrigation systems is permitted only two days per week. Addresses ending in even numbers (0,2,4,6,8) may water on Mondays and Thursdays. Addresses ending in odd numbers (1,3,5,7,9) may water on Tuesdays and Fridays. If there is no street address, or if more than one street address is associated with a contiguous property, the irrigation days are Wednesday and Saturday. (2) Manual landscape watering with a soaker hose, handheld hose or watering can/bucket is allowed on any day.
3	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering is permitted to maintain adequate growth on newly installed landscapes, for a period generally up to five (5) weeks. Property owners must notify the District of the address where new landscape is installed and the date of installation. (2) Following the initial establishment period, landscape watering using a sprinkler or irrigation system is permitted only on the days associated with the current conservation stage in effect.

Stage	Type Use	Restriction
3	Golf Courses, Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (2) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). (3) Course operators shall implement a ten (10) percent reduction in irrigation water use.
3	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must offer and clearly notify guests of a "limited linen/towel exchange" program.
3	Swimming pools, hot tubs	Initially filling new and existing swimming pools prohibited. Draining and refilling existing swimming pools permitted only if repairing a pool leak or repairing, maintaining or replacing a pool component that has become hazardous. All pools and tubs shall be covered when not in use to reduce evaporation.
3	Industrial and Commercial	Reduction of water use by any means is encouraged. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
3	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned landscape watering days during landscape watering hours (before 10:00 a.m. or after 5:00 p.m.). Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.
3	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.

Stage	Type Use	Restriction
4	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering using sprinkler or irrigation systems is permitted only one day per week. Addresses ending in numbers 0 or 1 may water on Mondays. Addresses ending in numbers 2 or 3 may water on Tuesdays. Addresses ending in numbers 4 or 5 may water on Wednesdays. Addresses ending in numbers 6 or 7 may water on Thursdays. Addresses ending in numbers 8 or 9 may water on Fridays. If there is no street address, or if more than one street address is associated with a contiguous property, the irrigation day is Wednesday. Manual landscape watering with a soaker hose, handheld hose or watering can/bucket is allowed on any day.
4	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. The installation of new landscapes irrigated with potable water is discouraged. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering is permitted three (3) days a week to maintain adequate growth on newly installed landscapes, for a period generally up to five (5) weeks. Watering days for new landscapes are Tuesday, Thursday and Saturday. Property owners must notify the District of the address where new landscape is installed and the date of installation. Following the initial establishment period, landscape watering using a sprinkler or irrigation system is permitted only on the days associated with the current conservation stage in effect.

Stage	Type Use	Restriction
4	Golf Courses / Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (2) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). Course operators shall implement a twenty (20) percent reduction in irrigation water use.
4	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must limit linen/towel changes to once every two (2) nights or for the entire stay, whichever is shorter, except for health and safety.
4	Swimming pools, hot tubs	Initially filling new and existing swimming pools prohibited. Draining and refilling existing swimming pools permitted only if repairing a pool leak or repairing, maintaining or replacing a pool component that has become hazardous. All pools and tubs shall be covered when not in use to reduce evaporation.
4	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned landscape watering days during landscape watering hours (before 10:00 a.m. or after 5:00 p.m.). Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.
4	Industrial and commercial	Reduction of water use by any means is encouraged. The Board of Directors may establish mandatory use reduction targets, if needed. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
4	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.
5	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water is prohibited.

Stage	Type Use	Restriction
5	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. The installation of new landscapes irrigated with potable water is prohibited during Conservation Stage 5. New landscapes installed prior to declaration of Conservation Stage 5 may water two (2) days a week to maintain adequate growth on newly installed landscapes, for the remainder of the initial five (5) week establishment period. Watering days for new landscapes are Tuesday and Friday. Property owners must notify the District of the address where new landscape is installed and the date of installation
5	Golf Courses / Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (3) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (4) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). Course operators shall implement a thirty (30) percent reduction in irrigation water use.
5	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must limit linen/towel changes to once every three (3) nights or for the entire stay, whichever is shorter, except for health and safety.
5	Swimming pools, hot tubs	Filling new swimming pools and/or draining and refilling existing swimming pools is prohibited. All pools and tubs shall be covered when not in use to reduce evaporation. Contact District conservation staff if an existing swimming pool must be repaired and refilled during Conservation Stage 5.
5	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment is prohibited. Only commercial facilities with water recycling systems may be used.
5	Industrial and commercial	Reduction of water use by any means is encouraged. The Board of Directors may establish mandatory use reduction targets, if needed. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
5	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible. The District may establish mandatory construction water budgets, if needed.

Attachments

Draft Water Shortage Contingency Plan in track-changes

San Antonio, TX, Code of Ordinances, Chapter 34, Water and Sewers, Article IV, Water Conservation and Reuse

MARINA COAST WATER DISTRICT
URBAN WATER SHORTAGE CONTINGENCY ANALYSIS AND PLAN

1.0 INTRODUCTION AND BACKGROUND

This Water Shortage Contingency Plan is developed in compliance with California Water Code Section 10632. Requirements of subsections (a)-(i) are identified below and are accompanied by the required elements and information.

The Marina Coast Water District (MCWD) obtains all its water supplygroundwater from the Salinas Valley Groundwater Basin (SVGB). The SVGB is not adjudicated and provides water for growers, municipalities and other municipal and industrial uses in the Salinas Valley. Due to cumulative basin pumping, coastal aquifers are experiencing seawater intrusion. MCWD continues working to work with Monterey County Water Resources Agency (MCWRA) in developing plans to coordinate and encourage preservation of the SVGB aquifers by all municipal and agricultural users.

In 2005, MCWD interconnected its two service areas, Central Marina and the Ord Community. Thise interconnection has improved system-wide reliability, making maximum use of available water storage tanks in the Ord Community and allowing both areas to be served by any of the six District wells. In 2007, the District consolidated the two systems under a single Public Water System Permit.

MCWD is actively pursuing development of a Regional Water Supply Project, in partnership with the Monterey County Water Resources Agency (MCWRA) and California-American Water Company (CAWC). The Regional Project will develop desalinated water from the seawater-intruded portion of the SVGB. This supply will meet current water demands within the CAWC Monterey service area, and future water demands within the MCWD Ord Community. The wells to be installedation of wells within the intruded portions of the SVGB is are intended to capture seawater along the coast before it can migrate to inland portions of the aquifer. The project also includes a recycled water component, that will provide non-potable water for landscape irrigation within the MCWD and CAWC service areas.

- One Systems Interconnection. In 2005 MCWD will intertie its Central Marina and Ord Community water distribution systems. The intertie is driven by the immediate need to remove from service the Bayer Tank in Central Marina due to its poor structural condition. This intertie will enhance the robustness of both water distribution systems and provide each community an emergency, potable water source.

- Regional Urban Water Supply Planning. MCWD is an active participant in the regional urban water supply planning effort being led by the MCWRA. One possible regional project is the proposed desalination plant at Moss Landing. Project proponents include California-American Water Company, Pajaro/Sunny Mesa Water District, and the MCWRA. As planning for this project proceeds, MCWD will consider becoming directly involved as a water recipient.

~~O~~other coordinated effort~~s~~ include~~s~~ the ~~following:~~

~~-~~Water Awareness Committee of Monterey County (WAC). Through the WAC, ~~R~~representatives from several agencies throughout Monterey County work together coordinating conservation and other water awareness efforts including education programs, information booths for special events and public understanding of Monterey County water challenges and opportunities.

California Water Code Section 10632(~~–~~c~~–~~) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies, including but not limited to, a regional power outage, an earthquake or other disaster.

The MCWD developed and adopted an Emergency Response Plan for emergency and disaster occurrences with guidelines and agreements for cooperative efforts with other State and local agencies, as required by the State Health Department. This Plan contains actions MCWD would initiate in the event of a catastrophic reduction in its water supply.

2.0 STAGES OF ACTION

California Water Code Section 10632(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

The MCWD developed a five-stage Water Conservation Plan that includes two voluntary and three mandatory stages. Table 2-1 generally describes the various stages. Specific water supply conditions applicable to each stage, referred to as "triggering mechanisms" herein, are discussed in the next section.

Table 2-1: Water Conservation Stages and Reduction

Stage	Demand Reduction Goal	Type Program
Stage 1	10% reduction	Voluntary
Stage 2	15% reduction	Voluntary
Stage 3	25% reduction	Mandatory
Stage 4	35% reduction	Mandatory
Stage 5	50%+ reduction	Mandatory
Priorities for use of available water, based on California Water Code Chapter 3 are: 1. Health and Safety - interior residential and fire fighting 2. Commercial, Industrial, and Governmental - maintain jobs & economic base 3. Existing Landscaping - especially trees and shrubs 4. New Demand - projects without permits when shortage declared		

California Water Code Section 10632(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

This requirement is oriented toward water supply systems that are primarily supplied via surface waters and therefore can be directly affected by short-term fluctuations in hydrology i.e., drought conditions. MCWD's total current water supply is produced through groundwater pumping from the large SVGB. MCWD supply availability from this basin has not historically varied due to short-term hydrologic conditions. The minimum water supply available within the driest three-year sequence is expected to match demands as discussed in the Urban Water Management Plan.

3.0 TRIGGERING MECHANISMS

The SVGB is currently the most important source of water for MCWD. In 2004, the MCWD's groundwater withdrawals of about 4,60~~6~~0 acre-feet accounted for less than one percent (1%) of the estimated basin-wide annual extractions of roughly 550,000 acre-feet. Given this relatively small percentage, MCWD conservation and contingency management activities can play only a small part within the SVGB. The foremost concern in developing appropriate triggers is achieving the maximum practical protection of an adequate long-term water supply of acceptable quality for MCWD customers. To that end, triggering mechanisms should be tied to factors that, directly or indirectly, have the greatest potential effect on the quality and quantity of available groundwater.

Two general types of ~~general~~ threats could cause MCWD to ~~reduce demands to its system~~experience water shortages:

1. ~~u~~Unanticipated catastrophic system failure due to an earthquake, terrorist attack or sudden contamination of water supply, or
2. ~~c~~Chronic system shortage due to seawater intrusion reaching water supply wells in concentrations such that those wells would have to be removed from service.

In the case of a catastrophic failure, the MCWD would assess the nature and extent of the failure, and the General Manager would identify the appropriate Conservation Stage in accordance with the expected level of water supply shortage. Should shortages be anticipated in amounts beyond fifty percent of normal demands, emergency actions will be taken in accordance with the MCWD's Emergency Response Plan, including enacting emergency ordinances as may be required by MCWD Board of Directors.

The chronic system threat to MCWD's present water supplies is seawater intrusion, which has occurred along the coastal margin of the Salinas Valley in response to historic over-drafting of the basin. Contamination from volatile organic compounds (VOCs) ~~have~~ has also affected MCWD wells and could pose additional problems. Although seawater intrusion has not yet affected the deep zone (400-Foot Aquifer) of the SVGB (which is the source of supply for Marina's~~–~~ Well No.10, No.11, and No.12), it is possible that continued extractions in the 400~~'~~-Foot Aquifer could ultimately lead to contamination of these water supplies by seawater. MCWD monitors the rate of seawater intrusion and plans to construct a new well in the deep aquifer and develop alternative water resources~~, which~~ that would be insulated from intrusion.

However, it is possible for intrusion to appear in a relatively short time span and reduce overall supplies available. Consequently, the MCWD has structured ~~its~~ this Water Shortage Contingency Plan with the primary goal of reducing water supply demands to allow time for alternative water supply measures, including the drilling of alternate wells in areas unaffected by intrusion and/or contamination. A specific triggering mechanism for various levels of conservation is tied to concentrations of chlorides in MCWD wells~~,~~ and possibl~~e~~y concentrations of VOCs, such as trichloroethylene (TCE) ~~currently~~ which was previously observed at low levels in Well No. 9 in Central Marina and is occasionally detected at Well No. 29 in the Ord Community. Chloride concentration is directly related to the seawater intrusion problem, and both parameters (chloride and VOCs) are related to the overall basin viability as a secure source of water supply.

Chloride concentration~~s~~, which ~~are~~ is the ~~proposed~~ trigger for the most advanced stages of conservation, ~~are~~ is also a key indicator of water quality degradation due to seawater intrusion. Tests for statistically significant changes in chloride concentrations assist in the detection of the earliest stages of intrusion and are appropriate indicators of a water supply emergency. In addition, MCWD currently monitors its Ord Community wells for the presence of TCE and other organic compounds, and works with the U.S. Army regarding the Army's groundwater cleanup actions in the Ord Community.

~~MCWD is currently retiring Well No. 9 in Central Marina.~~

~~PROPOSED~~ TRIGGERING MECHANISMS FOR CONSERVATION STAGES

~~Triggering Mechanisms~~

These Triggering mechanisms shall be interpreted as guidelines and are summarized in Table 2-2. ~~—~~The General Manager and/or Board of Directors may impose any of the following conservation stages based upon facts and circumstances which may not have been otherwise anticipated in this plan.

Table 2-2 Conservation Level Triggering Mechanisms

Conservation Stage and Shortage Level	Triggering Mechanism
Stage One 0-10% Voluntary	1) system malfunction resulting in up to 10% shortage 2) increase in chlorides which do not threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending
Stage Two >10-25% Voluntary	1) system malfunction resulting in greater than10% shortage 2) increase in chlorides which may threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending
Stage Three	1) system malfunction resulting in greater than 25% shortage

>25-35% Mandatory	2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced by up to 25%
Stage Four >35-50% Mandatory	1) system malfunction resulting in greater than 35% shortage 2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced more than 35%
Stage Five >50% Mandatory	1) system malfunction resulting in greater than 50% shortage 2) increase in chlorides which may threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards or when remaining capacity is reduced more than 50%

STAGE 1: Up to 10% - Voluntary

Stage 1 conservation ~~savings~~ measures may be called for as a result of malfunction of all or portions of the water system that reduces supplies by up to 10% on a daily, peak seasonal or annual basis. It also may be called due to prolonged drought conditions and a need to focus public attention on water conservation.

Further triggering could also be based on:

1) detection of a statistically significant increase in chloride concentrations but where such concentrations do not threaten to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of a statistically significant increase in VOC concentrations but where such concentrations do not threaten to exceed the primary drinking water maximum contaminant level (MCL) for each VOC at the well(s) in question and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards.

STAGE 2: >10% to 25% -Voluntary

Stage 2 conservation ~~savings~~ measures may be called ~~upon~~ for due to malfunction or failure of all or portions of the water system that reduces supplies by greater than 10% on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of a statistically significant increase in chloride concentrations where

such concentrations may threaten to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of a statistically significant increase in VOC concentrations, but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC at the well(s) in question and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards.

STAGE 3: >25% to 35% - Mandatory

Stage 3 conservation ~~savings~~ measures may be called for due to malfunction or failure of all or portions of the water system that reduces supplies by greater than 25% on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of an increase in chloride concentrations where such concentrations are expected to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of VOC concentrations, but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC, and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards, and/or when gross reduced well production of up to 25% is necessary to maintain adequate water quality.

STAGE 4: >35% to 50% - Mandatory

Stage 4 conservation ~~savings~~ measures may be called for due to malfunction or failure of all or portions of the water system that reduces supplies by greater than 35% on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of an increase in chloride concentrations where such concentrations are expected to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of VOC concentrations, but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC, and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards, and/or gross reduced well production of up to 35% is necessary to maintain adequate water quality.

STAGE 5: >50% - Mandatory

Stage 5 conservation ~~savings~~measures may be called for due to in malfunction or failure of all or portions of the water system that reduces supplies by 50 % or more on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of an increase in chloride concentrations where such concentrations are expected to exceed the short term primary drinking water standard of 600 mg/l at the well(s) in question, or

2) detection of VOC concentrations but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC, and /or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards, and/or gross reduced well production of over 50% is necessary to maintain adequate water quality.

4.0 CONSERVATION REQUIREMENTS AND APPEAL PROCEDURES

The following ~~is~~ are MCWD's conservation requirements by customer type and stage and the appeal~~s~~ procedures. These requirements and procedures are adopted as part of MCWD's Water Shortage Contingency Plan.

STAGE 1: Up to 10% - Voluntary – Minimal Conservation Requirement

~~**Stage 1 Minimal Conservation Requirement: up to 10 percent -Voluntary Program**~~

MCWD shall:

- notify all customers of the water shortage
- mail information to every customer and reasonably available potential water user explaining the importance of significant water use reductions
- provide technical information to customers on ways to improve water use efficiency
- conduct media campaign to remind consumers of the need to save water
- publicize the showerhead, toilet rebate and other efficiency programs
- enforce mandatory restrictions on water waste as provided in MCWD Code, Chapter 3

STAGE 2: >10% to 25% -Voluntary – Moderate Conservation Requirement

~~**Stage 2 Moderate Conservation Requirement: >10 to 25 percent - Voluntary Program**~~

In addition to the actions listed in Stage 1, MCWD shall call for voluntary reductions of up to 25% for each connection based on the average use during a base period proposed by the Water Conservation Commission and adopted by MCWD's Board of Directors.

STAGE 3: >25% to 35% - Mandatory – Severe Conservation Requirement

~~**Stage 3 Severe Conservation Requirement: >25 percent to 35 percent - Mandatory Program**~~

In addition to the actions listed in Stage 1 and 2, MCWD shall establish mandatory annual allotments for each connection based on the average use during a base period proposed by the Water Conservation Commission and adopted by MCWD's Board of Directors. When Stage ~~three~~ 3 use reduction becomes necessary, administration and enforcement of water conservation rules becomes the major focus of MCWD. If necessary, additional temporary personnel may be hired and special meetings of the Water Conservation Commission and /or Board of Directors may be scheduled.

1. Each water service connection shall receive an allotted quantity of water, typically specified in hundred cubic feet (hcf) units per billing cycle, as calculated by the Water Conservation Coordinator.

2. The Board of Directors may pass an emergency ordinance increasing the usage rate for potable water in order to ensure stable revenues for operation and maintenance of MCWD.

3. As individual customers are notified of allotments, it is expected that many requests for special consideration will be received. These petitions must be processed rapidly, efficiently and fairly. Every application for waiver must be heard, evaluated and acted upon by the Water Conservation Commission as rapidly as possible. Every action by the Water Conservation Commission shall be referred to MCWD's Board of Directors for consideration. The procedures for appeal are defined, below.

4. No building permits will be issued or meters installed for new accounts that had not received building permits before the "Severe Shortage" was declared.

5. The following water use restrictions shall be imposed.

Stage	Type Use	Restriction
3	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering using sprinkler or irrigation systems is permitted only two days per week. Addresses ending in even numbers (0,2,4,6,8) may water on Mondays and Thursdays. Addresses ending in odd numbers (1,3,5,7,9) may water on Tuesdays and Fridays. If there is no street address, or if more than one street address is associated with a contiguous property, the irrigation days are Wednesday and Saturday. (2) Manual landscape watering with a soaker hose, handheld hose or watering can/bucket is allowed on any day.
3	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering is permitted to maintain adequate growth on newly installed landscapes, for a period generally up to five (5) weeks. Property owners must notify the District of the address where new landscape is installed and the date of installation. (2) Following the initial establishment period, landscape watering using a sprinkler or irrigation system is permitted only on the days associated with the current conservation stage in effect.
3	Golf Courses, Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (2) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). (3) Course operators shall implement a ten (10) percent reduction in irrigation water use.
3	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must offer and clearly notify guests of a "limited linen/towel exchange" program.

Stage	Type Use	Restriction
3	Swimming pools, hot tubs	Initially filling new and existing swimming pools prohibited. Draining and refilling existing swimming pools permitted only if repairing a pool leak or repairing, maintaining or replacing a pool component that has become hazardous. All pools and tubs shall be covered when not in use to reduce evaporation.
3	Industrial and Commercial	Reduction of water use by any means is encouraged. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
3	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned landscape watering days during landscape watering hours (before 10:00 a.m. or after 5:00 p.m.). Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.
3	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.

STAGE 4: >35% to 50% - Mandatory – Critical Conservation Requirement

~~**Stage 4 Critical Conservation Requirement: >35 to 50 percent - Mandatory Program**~~

In addition to the actions listed in the previous stages, MCWD shall establish allotments based upon a 35% -50% curtailment of water use. All new and previous appeals for waiver shall be evaluated by field audit and shall be reheard by the Water Conservation Commission, if necessary, upon recommendation of MCWD staff. Water rates may be increased by the Board of Directors.

The following water use restrictions shall be imposed.

Stage	Type Use	Restriction
4	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering using sprinkler or irrigation systems is permitted only one day per week. Addresses ending in numbers 0 or 1 may water on Mondays. Addresses ending in numbers 2 or 3 may water on Tuesdays. Addresses ending in numbers 4 or 5 may water on Wednesdays. Addresses ending in numbers 6 or 7 may water on Thursdays. Addresses ending in numbers 8 or 9 may water on Fridays. If there is no street address, or if more than one street address is associated with a contiguous property, the irrigation day is Wednesday. Manual landscape watering with a soaker hose, handheld hose or watering can/bucket is allowed on any day.
4	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. The installation of new landscapes irrigated with potable water is discouraged. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering is permitted three (3) days a week to maintain adequate growth on newly installed landscapes, for a period generally up to five (5) weeks. Watering days for new landscapes are Tuesday, Thursday and Saturday. Property owners must notify the District of the address where new landscape is installed and the date of installation. Following the initial establishment period, landscape watering using a sprinkler or irrigation system is permitted only on the days associated with the current conservation stage in effect.

Stage	Type Use	Restriction
4	Golf Courses / Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (2) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). Course operators shall implement a twenty (20) percent reduction in irrigation water use.
4	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must limit linen/towel changes to once every two (2) nights or for the entire stay, whichever is shorter, except for health and safety.
4	Swimming pools, hot tubs	Initially filling new and existing swimming pools prohibited. Draining and refilling existing swimming pools permitted only if repairing a pool leak or repairing, maintaining or replacing a pool component that has become hazardous. All pools and tubs shall be covered when not in use to reduce evaporation.
4	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned landscape watering days during landscape watering hours (before 10:00 a.m. or after 5:00 p.m.). Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.
4	Industrial and commercial	Reduction of water use by any means is encouraged. The Board of Directors may establish mandatory use reduction targets, if needed. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
4	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.

STAGE 5: >50% - Mandatory – Emergency Conservation Requirement

~~**Stage 5 Emergency Conservation Requirement: >50 percent - Mandatory Program**~~

Appropriate 50% water shortage allotments shall be calculated and noticed to customers. Appropriate administration and enforcement of this stringent program shall be the highest priority of MCWD activity. All resources of MCWD will be directed toward improvement and

increase of water supply to the system. Water rates may be further increased by the Board of Directors.

The following water use restrictions shall be imposed:

Stage	Type Use	Restriction
5	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water is prohibited.
5	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. The installation of new landscapes irrigated with potable water is prohibited during Conservation Stage 5. New landscapes installed prior to declaration of Conservation Stage 5 may water two (2) days a week to maintain adequate growth on newly installed landscapes, for the remainder of the initial five (5) week establishment period. Watering days for new landscapes are Tuesday and Friday. Property owners must notify the District of the address where new landscape is installed and the date of installation
5	Golf Courses / Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (3) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (4) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). Course operators shall implement a thirty (30) percent reduction in irrigation water use.
5	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must limit linen/towel changes to once every three (3) nights or for the entire stay, whichever is shorter, except for health and safety.
5	Swimming pools, hot tubs	Filling new swimming pools and/or draining and refilling existing swimming pools is prohibited. All pools and tubs shall be covered when not in use to reduce evaporation. Contact District conservation staff if an existing swimming pool must be repaired and refilled during Conservation Stage 5.
5	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment is prohibited. Only commercial facilities with water recycling systems may be used.

Stage	Type Use	Restriction
5	Industrial and commercial	Reduction of water use by any means is encouraged. The Board of Directors may establish mandatory use reduction targets, if needed. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
5	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible. The District may establish mandatory construction water budgets, if needed.

Appeals Procedure

1. Any person who wishes to appeal a customer classification or allotment shall do so in writing by using the forms provided by MCWD.

2. Appeals will be reviewed by the Water Conservation Coordinator and staff. Site visits may be scheduled if required.

3. A condition of granting an appeal shall be that all plumbing fixtures or irrigation systems be replaced or modified for maximum water conservation.

4. Examples of appeals that may be considered are as follows:

a. Substantial medical requirements.

b. Commercial/Industrial/Institutional accounts where any additional water supply reductions will result in unemployment or inappropriate hardship, after confirmation by the MCWD staff that the account has instituted all applicable water efficiency improvements.

5. In the event an appeal is requested for irrigation of trees or vegetation, MCWD staff may use the services of a qualified consultant in determining the validity of the request. Costs for such consulting services shall be paid by the party or parties making the request.

6. The Water Conservation Coordinator shall refer all appeals to the Water Conservation Commission. The Water Conservation Commission may refer appeals to MCWD's Board of Directors.

7. If the Water Conservation Commission and the applicant are unable to reach accord, then the appeal shall be heard by the MCWD Board of Directors, who will make the final determination.

8. All appeals shall be reported monthly to the Board as a part of the Water Supply Report.

54.0 MANDATORY PROHIBITIONS ON WATER USE

California Water Code Section 10632(d). Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. Section 10632(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

The MCWD adopted a "Water Waste/Water Conservation" Ordinance (Ordinance No. 20) in April of 1990, which prohibits water waste and promotes water conservation. Since the initial adoption, revisions were adopted by the Board of Directors on ~~14~~ April 14, 1992 and ~~4~~ October 4, 1993. The ordinance has most recently been revised on and now appears as Chapter 3.36 of MCWD Code. Section 3.36.030, Mandatory Restrictions on Water Waste, details the applicable prohibitions of use. These prohibitions are in force at all times. Additional water use reduction methods available to water users or MCWD to adopt in order to comply with use reductions during the more restrictive stages of water shortages (Stages 4 and 5) include, but are not limited to, the following:

a) elimination of turf irrigation with potable supplies;

b) restriction of landscape watering to shrubs and trees by hand or drip irrigation only;

c) elimination of vehicle washing except in car washes that have water recirculation systems;

d) prohibition on filling or topping off of swimming pools where damage to pumping equipment will not result;

e) elimination of water served in food service establishments unless requested;

f) elimination of the issuance of construction meters;

g) shut-off of dedicated landscape irrigation meters; and

h) moratorium on provision of new supply meters.

If water use reductions called for in Stages 3-5 are not achieved, the MCWD may amend this Water Shortage Contingency Plan to make any of the above available conservation tactics mandatory.

65.0 PENALTIES OR CHARGES FOR EXCESSIVE USE

California Water Code Section* 10632(f) *Penalties* or *charges / for excessive use.

Section 3.36.050 of MCWD Code provides for a system of violations and notices. Violation of provisions of this Water Shortage Contingency Plan shall be enforced under Section 3.36.050 of MCWD Code.

76.0 REVENUE AND EXPENDITURE IMPACTS

California Water Code Section 10632(g) – An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

Enforcement of the water Water shortage Shortage contingency Contingency plan Plan is assumed to be covered by enhanced revenues due to from application of excess use charges and penalties. MCWD reserves may be utilized used temporarily should revenues remain below expectations. MCWD's rate structure is based upon adopted rate ranges and allows for modification of rates on short notice within those ranges. MCWD retains the ability to modify rates to meet all legitimate MCWD needs. Revenue impacts from water sales losses are estimated as follows, based upon Tmarginal commodityier 2 rates of $2.35/hcf in Central Marina and $2.86/hcf in the Ord Community$2.81/hcf, and recognizing approximately 4010% of MCWD's supplies customers are not metered as of 20052010.

Table 6-3: Potential Revenue Impacts of Implementation of WSCP

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Assumed Reduction	10 percent	20 percent	30 percent	40 percent	50 percent
Water Sales Loss	$ 454,664	$ 909,329	$1,363,993	$ 1,818,658	$ 2,273,322
Revenue Source: Pumping savings at $135/af	$ 53,569	$ 107,138	$ 160,707	$ 214,276	$ 267,845
Net Revenue Reduction	$ 401,095	$ 802,191	$1,203,286	$ 1,604,382	$ 2,005,477
Percent of Total Annual Water System Revenue	5%	11%	16%	21%	27%

* Table based on FY2009-2010 water sales, $7,501,854 for 3,970 acre-feet

87.0 WATER SHORTAGE CONTINGENCY PLAN IMPLEMENTATION

California Water Code Section 10632* (h) *A draft water shortage contingency resolution or ordinance.

MCWD Board of Directors will adopt this Water Shortage Contingency Plan in Resolution No. 2005-xx, which enables implementation of the Plan upon advice of staff based in part on the

triggering mechanisms discussed herein. A draft of the resolution is attached as Appendix A to this Plan.

98.0 WATER USE MONITORING PROCEDURES

California Water Code Section 10632* (i) *A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency plan.

Normal Monitoring Procedure:

In normal water supply conditions, production figures are recorded daily by MCWD O&M personnel. Totals are reported monthly to the Water Conservation Coordinator and Water Quality Manager. Production figures are reported in the Annual Report to the Drinking Water Program, which is submitted to the California Department of Health Services each year.

Stage 1 and 2 Water Shortages

During a Stage 1 or 2 water shortage, daily production figures will be reported to the O&M Superintendent and Water Conservation Coordinator. The Water Conservation Coordinator compares the weekly production to the target weekly production to verify that the reduction goal is being met. Monthly reports are forwarded to the General Manager, the Water Conservation Commission and the MCWD Board of Directors. If reduction goals are not met, the General Manager may notify the Board of Directors so that corrective action can be taken.

Stage 3 and 4 Water Shortages

During a Stage 3 or 4 water shortage, the procedure listed above will be followed, with the addition of a daily production report to the General Manager and weekly reports to the Water Conservation Commission and Board of Directors. Special meetings may be called for administration of the Water Shortage Contingency Plan.

Stage 5 Water Shortage

During a Stage 5 shortage, production figures will be reported to the O&M Superintendent hourly, and to the General Manager and the Water Conservation Coordinator daily. Reports will also be provided to MCWD's Board of Directors, the Monterey County Office of Emergency Services, and land use jurisdictions located within MCWD's service territory.

Chapter 34 WATER AND SEWERS*

***Charter references:** Authority of city to acquire and maintain property for water and sewer systems, § 3, par. 13(1), (23); powers with respect to sanitary sewer system, § 3, par. 10; public works department, § 60 et seq.

Cross references: Buildings generally, § 6-1 et seq.; fire prevention, § 11-1 et seq.; flood plains, § 12-1 et seq.; swimming pools, § 15-186 et seq.; standards and specifications for mobile home parks, § 18-61 et seq.; swimming in city parks, § 22-86; fishing in city parks, § 22-101; plumbing, § 24-1 et seq.; streets and sidewalks, § 29-1 et seq.; subdivisions, § 30-1 et seq.; zoning, § 35-1 et seq.

State law references: Authority of home rule cities to enact ordinances more stringent than minimum state standards with respect to water and sewage, Vernon's Ann. Civ. St. art. 4477-1, § 23.

Art. IV. Water Conservation and Reuse, §§ 34-271--34-425

ARTICLE IV. WATER CONSERVATION AND REUSE*

***Editor's note:** Ord. No. 80574, § 14, adopted Aug. 4, 1994, repealed former Art. IV, §§ 34-271--34-283, relative to liquid waste transportation and disposal regulations, which derived from Ord. No. 64987, adopted May 7, 1987; and Ord. No. 69740, adopted June 29, 1989. Said Ord. No. 80574 enacted new provisions regarding similar subject matter which have been included in this chapter as Division 4 of Article V, § 34-511 et seq.

DIVISION 1. REGULATED ACTIVITIES

Sec. 34-271. Definitions.

As used in this article, the following terms shall have the following meanings:

Air conditioning system(s) means a mechanical system generally consisting of a compressor, thermostat and duct work permanently installed in a building for the purpose of controlling humidity and temperature. For the purposes of this division, an air conditioning system does not include window units.

Automatic irrigation controller means a device that automatically activates and deactivates an irrigation system at times selected by the operator.

Blowdown meter means a meter that tracks the amount of water discharged from a cooling tower system.

Commercial dining facility means a business that serves prepared food and beverages to be consumed on the premises.

Concentration means re-circulated water that has elevated levels of total dissolved solids as compared to the original make up water.

Conservation department means the Conservation Department of the San Antonio Water System.

Conductivity controller means a device used to measure the conductivity of total dissolved solids in the water of a cooling system and control the discharge of water in order to maintain efficiency.

Cooling tower means an open water recirculation device that uses fans or natural draft to draw or force air to contact and cool water through the evaporative process.

Director of conservation means the director of the department of conservation of the San Antonio Water System.

Impervious surface means patios, pathways and other areas where firm footing is desired, constructed in such a way that does not allow water to penetrate the ground. Examples include but are not limited to concrete slab patios, sidewalks and driveways, asphalt streets or pavers set with mortar.

Irrigation system means a system with fixed pipes and emitters or heads that apply water to landscape plants or turfgrass, including, but not limited to, in-ground and permanent irrigation systems.

Irrigation system analysis means a zone-by-zone analysis of an irrigation system that, at a minimum, includes a review of the following elements:
(1) Design appropriateness for current landscape requirements;
(2) Irrigation spray heads and valves;
(3) Precipitation rates expressed in inches per hour;
(4) Annual maintenance plan that includes irrigation system maintenance, landscape maintenance, and a basic summer and winter irrigation scheduling plan.

Large property means a tract of land or several tracts of land managed as a group such as commonly found in neighborhood common areas or medians and street setbacks commonly found associated with commercial development regardless of the number of meters or individual parcel sizes associated with the property that equals or exceeds five (5) acres in size and has an irrigation system covering all or a portion of the property.

Large use property means any property that uses in 1 million gallons of water or more for irrigation purposes in a single calendar year.

Low-flow toilet means a tank toilet that uses one and sixth-tenths (1.6) gallons or less of water per flush.

Make-up meter means a meter that measures the amount of water entering a cooling tower system.

NPDES/TPDES permit holders means those entities that have valid state or federal permits commonly referred to as NPDES or TPDES [National Pollutant Discharge Elimination System/Texas Pollutant Discharge Elimination System] permits to satisfy requirements of the federal Clean Water Act.

Person means any individual, corporation (including a government corporation), organization, state or federal governmental subdivision or agency, political subdivision of a state, interstate agency or body, business, trust, partnership, limited partnership, association, firm, company, joint stock company, joint venture, commission or any other legal entity.

Pervious hardscape means patios, pathways and other areas where firm footing is desired, constructed in such a way that allows for water to penetrate the ground. Examples include flagstone set in sand and wood plank decks, but exclude concrete slab patios and sidewalks or pavers set with mortar.

Positive shut-off means a valve that is held in a closed position by system pressure until overridden by an outside force.

Power washer means a machine that uses water or a water-based product applied at high pressure to clean impervious surfaces.

Rain sensor means a device designed to stop the flow of water to an automatic irrigation system when rainfall has been detected.

Recycled water means domestic or municipal wastewater which has been treated to a quality suitable for a beneficial use in accordance with applicable law.

Requestor means a customer who requests a variance under this division.

Residential customer means a single or multi-family dwelling unit containing two (2) or fewer family units.

Summer dormancy means the ability of turfgrass to survive without water for a period of sixty (60) consecutive days during the months of May through September. Turfgrass with summer dormancy capabilities approved for use are set forth in the approved low water use plant list. The approved low water use plant list, as may be amended from time to time, shall be available from SAWS and located at www.saws.org/conservation.

Turfgrass means perennial ground cover plants and grasses that are adapted to regular mowing and traffic through management.

Vacuum system means a system, often consisting of a pump, chamber, and tubes, that is used to create a vacuum for any of a variety of purposes, including but not limited to medical, dental and industrial applications.

Variance administrator means staff person in the department of Conservation responsible for administering and hearing variance requests under this division.

Vehicle wash facility. A permanently-located business that washes vehicles with water or water-based product, including but not limited to self-service car washes, full-service car washes, roll-over/in-bay style car washes, and fleet maintenance wash facilities.

Vehicle wash fundraiser means any special-purpose vehicle wash event for which a fee is charged or donation accepted.

Water flow restrictor means an orifice or other device through which water passes at a restricted rate.

Xeriscape means a landscape consisting of a maximum of fifty (50) percent turfgrass, with the remaining percentage of landscape incorporating low water use plants and/or pervious hardscape. The approved low water use plant list, as may be amended from time to time, shall be available from SAWS and located at www.saws.org/conservation.

Zonal irrigation system means an irrigation system that segregates by station areas of shrubs, ground cover, bedding plants, and turf to accommodate a diversity of watering requirements.
(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-272. Activities to be regulated on and after effective dates.

The following activities shall be regulated in the manner set out herein on and after the respective dates indicated in the sections and subsections. A person affected by such regulations may request a variance in the manner set out in section 34-277. A violation of this section and subsections shall be subject to the enforcement provisions set out in section 34-278. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) ***Power washers.***
a. Effective January 1, 2006, a person who uses a power washer in any commercial

manner or for compensation shall register with the director of conservation, and obtain a certificate for such use.

b. Exempted from this requirement are persons who use power washers for personal use at their own home and homebuilders who are performing a one-time clean up at a newly constructed house.

c. Holders of NPDES/TPDES permits are deemed certified.

Comment. This comment does not have force of law, but is offered for clarification only. The intent of this registration protocol is to complement and make effective mandates necessary to critical period conservation rules found elsewhere in this Code. The conservation rules in question are intended to prevent water waste under certain circumstances when critical periods are observed. Examples of persons subject to year round registration are those hired, employed or contracted to clean sidewalks, parking lots, commercial/public buildings and other impervious areas associated with commercial or domestic properties; professional painters; businesses using their own in-house power washers such as chain stores, grocery stores, and any other entity, public or private.

(2) ***Vehicle wash fundraisers***. Effective March 1, 2005, any vehicle wash fundraiser shall be conducted at a vehicle wash facility using such facility's equipment.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-273. Activities to be regulated on and after January 1, 2006.

Except as provided by a specific and alternative application date, particularly systems analysis, the following activities shall be regulated in the manner set out herein on and after January 1, 2006. A person affected by such regulations may request a variance in the manner set out in section 34-277. A violation of this section and subsections shall be subject to the enforcement provisions set out in section 34-278. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) ***Minimum irrigation area and flow direction***. Newly installed irrigation systems using pop-up spray or rotor technology shall not be used in landscaped areas which have both:

a. Dimensions less than five (5) feet in length and/or width; and,

b. Impervious pedestrian or vehicular traffic surfaces along two (2) or more perimeters.

Where pop-up sprays and rotor heads are allowed in newly installed irrigation systems, they:

a. Must direct flow away from any adjacent impervious surface; and

b. Shall not be placed within four (4) inches from an impervious surface.

c. Irrigation systems newly installed in single family dwellings may not cover more than 10,000 square feet of landscape with spray or rotor irrigation heads. The use of drip irrigation or micro-sprays may be used to expand the coverage size upon approval of the landscape plan by SAWS.

(2) ***Annual irrigation system analysis for athletic fields, golf courses, large use and large properties.***

a. An annual irrigation system analysis shall be required for all athletic fields, golf courses, large use and large properties and shall be submitted in writing to the San Antonio Water System Conservation Department on or before May 1st of each year. Golf courses, athletic fields, and large properties that meet the definition of large use and large use properties regardless of size including residential properties must have a licensed irrigator sign–off on the annual irrigation system analysis. Golf courses, ether than those utilizing recycled water for irrigation in accordance with an agreement with SAWS, shall comply with

residential irrigation requirements on areas other than tee boxes, fairways and greens.

b. Municipal tenants and lessees of golf courses, sports and athletic playing fields, and any other municipally owned properties, shall be responsible for compliance with this section and subsection. The SAWS shall look directly to such tenants and lessees for compliance unless the municipality concedes by contractual agreement with the tenant/lessee to assume the tenant/lessee's responsibility for compliance.

(3) ***Cooling towers.*** **Effective January 1, 2006:**

a. Cooling towers, not utilizing recycled water, shall operate a minimum of four (4) cycles of **concentration**.

b. Newly constructed cooling towers shall be operated with conductivity controllers, as well as make-up and blowdown meters.

(4) ***Ice machines.*** Newly installed ice machines shall not be single pass water-cooled.

(5) ***Commercial dining facilities***. Commercial dining facilities shall:

a. Serve water only upon request.

b. Utilize positive shut-offs for hand-held dish-rinsing wands.

c. Utilize water flow restrictors for all garbage disposals.

(6) ***Vehicle wash facilities.***

a. Vehicle wash facilities, commencing operation on or after January 1, 2006, using conveyorized, touchless, and/or rollover in-bay technology shall reuse a minimum of fifty (50) percent of water from previous vehicle rinses in subsequent washes.

b. Vehicle wash facilities, commencing operation on or after January 1, 2006, using reverse osmosis to produce water rinse with a lower mineral content, shall incorporate the unused concentrate in subsequent vehicle washes.

c. Regardless of date of operation commencement, self-service spray wands used shall emit no more than three (3) gallons of water per minute.

(7) ***Vacuum systems.*** Vacuum systems shall not be water-cooled with single-pass potable water when alternative systems are available.

(8) ***Certain Plumbing Fixtures.***

When installing certain plumbing fixtures on or after January 1, 2010; gravity flush toilets, bathroom aerators, showerheads, urinals; in any location, residential, commercial, industrial, or institutional, the fixtures will meet or exceed the following performance standards; and where the Environmental Protection Agency has accepted that specific plumbing fixtures by make and model, meet or exceed the WaterSense standards, such fixtures installed will be from the most current listing available at the time of installation:

a. Gravity flush toilets shall have a maximum average water use of no more than 1.28 gallons per flush.

b. Faucet aerators for bathrooms shall have a maximum water flow of 1.5 gallons per minute.

c. Showerheads shall have a maximum water flow of 2.0 gallons per minute. All associated valves must be appropriate to the flows.

d. Urinals shall have a maximum water use of 0.5 gallons per flush.

(9) ***Coin Operated Washing Machines.***

All newly installed coin-operated washing machines, including but not limited to those that might be found in laundry-mats, apartment houses, dorms or communal use situations shall be selected from Consortium for Energy Efficiency (CEE) that meet or exceed the most current Tier 2 water and energy standards as determined by the CEE.

(10) ***Hot Water Lines.***

Buildings without a dedicated hot-water return lines with runs exceeding 20 feet between the heating element and the end use fixture shall be insulated with R-4 sleeve insulation.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-274. Other activities to be regulated on and after January 1, 2006.

The following activities shall be regulated in the manner set out herein on and after January 1, 2006. A person affected by such regulations may request a variance in the manner set out in section 34-277. A violation of this section and subsections shall be subject to enforcement provisions set out in section 34-278. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) ***Condensate collection.*** Newly constructed commercial buildings installing air conditioning systems on and after January 1, 2006, shall have a single and independent condensate wastewater line to collect condensate wastewater to provide for future utilization as:

a. Process water and cooling tower make-up, and/or

b. Landscape irrigation water. Condensate wastewater shall not be allowed to drain into a storm sewer, roof drain overflow piping system public way or impervious surface.

(2) ***Rain sensors***. Effective January, 1, 2006, rain sensors shall be installed and maintained on all irrigation systems equipped with automatic irrigation controllers.

(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-275. Landscaping regulations generally applicable on and after January 1, 2006.

Except as specifically provided with alternative effective dates, persons affected by the regulations set out herein below shall comply on and after January 1, 2006, and may request a variance to such regulations in the manner set out in section 34-277. A violation of this section and subsections shall be subject to the enforcement provisions set out in section 34-278. It shall be and is hereby declared unlawful for any person to violate, refuse or fail to implement the requirements of this division.

(1) ***Xeriscape option***. Effective January 1, 2006, homebuilders and/or developers subdividing lots and/or constructing new single family residential homes shall offer a xeriscape option in any series of landscaping options offered to prospective home buyers.

(2) ***Model***. Effective January 1, 2006, homebuilders and/or developers who construct model homes for a designated subdivision shall have at least one model home per subdivision landscaped according to a xeriscape design.

(3) ***Zonal system***. In-ground irrigation systems installed on and after January 1, 2006, shall be zonal irrigation systems.

(4) ***Turfgrass soil support.***

a. Turfgrass installed during or associated with new construction on and after January 1, 2006, shall have a minimum of four (4) inches of soil under the turfgrass.

b. Drainage utility projects, water and power utility projects, public property maintenance or repair, and those governmental activities necessary to NPDES/TPDES compliance with federal or state rules and regulations implementing the federal Clean Water Act; or governmental actions to comply with the Americans with Disabilities Act, shall not be deemed new construction for purposes of this subsection.

(5) ***Turfgrass dormancy qualities***. Turfgrass installed after January 1, 2007, shall have summer dormancy capabilities.

(6) ***Irrigation system use, setting and schedule recommendations.***

All irrigators installing irrigation systems permitted by the City of San Antonio shall provide to the irrigation system owner a recommended seasonal irrigation schedule and instructions on how to use the irrigation system and set the controller. Seasonal

schedules provided will be approved by SAWS Conservation Director or designee. The schedule will be affixed to the irrigation controller or an adjacent wall.

Legal comment. This comment does not have force of law, but is provided here for informational purposes only. The Texas Property Code, Chapter 202, Section 202.001, et. seq., entitled "Certain Restrictive Covenants," reflects a growing public interest in water conservation and its relationship to the public health, safety, and welfare.

Texas Property Code, Chapter 202, Section 202.007, provides that a property owners association may not include or enforce a provision in a dedicatory instrument that prohibits or restricts a property owner from implementing certain efficient irrigation systems, including underground drip or other drip systems. Any dedicatory instrument provision, attempting to restrict a property owner from installing such efficient systems, is void. Therefore, such restrictions, running counter to certain conservation efforts, cannot be enforced. Texas Real Property Code, Sec. 202.007(b).*Added by Acts 2003, 78 th Legislature, chapter 1024, § 1, Effective, September 1, 2003.*

As used within the Texas Property Code, "dedicatory instrument" means a governing instrument for the establishment, maintenance, and operation of a residential subdivision, planned unit development, condominium, townhouse regime, or any similar planned development. Texas Real Property Code, Sec. 202.007(1).

The Texas Property Code also allows that a property owners' association may restrict the type of turf used by a property owner in the planting of new turf [in the future] in order to encourage or require water conserving turf.

According to the Texas Property Code, property owners' associations may regulate, by dedicatory instrument or other legal means, installation of efficient irrigation systems, including establishing visibility limitations for aesthetic purposes.

The SAWS endorses and advocates the use of dedicatory instruments and other legal obligations among private parties which understandings may support and promote a culture of water conservation.
(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-276. Variances.

The authority to grant a variance and an appeal from such variance to the provisions of this division, is hereby delegated to the San Antonio Water System in the manner described herein. A determination by the San Antonio Water System pursuant to this section shall be deemed final for purposes of appeal. Appeal procedures are detailed below.

(1) ***Variance.*** A person who is affected by these provisions may seek a variance in the manner set out herein. A person shall request a variance within thirty (30) days of the date a provision becomes apparently applicable to that person's activities and/or properties. For example, a person will have standing to seek a variance within thirty (30) days following receipt of a formal (citation) or informal notice of violation; prior to a notice of violation; or at the discretion of the variance administrator when, in the administrator's judgment, to deny standing to pursue a variance would clearly deny the applicant an opportunity to have justice and equity done for the applicant's case. In the latter situation, for purposes of justice and equity, the standard for allowing a variance application to be heard or considered are the common notions of rightness and fair play.

(2) ***Time, date, place.*** A person seeking a variance under these provisions shall make such request in writing to the conservation department. Such request shall be reviewed by the variance administrator. If the

application, on its face, warrants a variance, the administrator may grant the request without hearing. Otherwise, the administrator shall review such request within thirty (30) days of receipt and shall inform the requestor in writing of the time, date and place for variance hearing, if necessary.

(3) ***Representation and notice of SAWS' response, first hearing.*** The requestor may be represented by a duly authorized representative and may introduce such evidence as the requestor believes to be relevant. The administrator and appropriate conservation department personnel shall hear the request. The requestor shall receive written notification by the administrator within thirty (30) days of the date of the hearing whether such variance is granted or denied.

(4) ***Appeal.*** In the event the variance is granted, the decision of the administrator shall be final. Should the variance be denied, however, the requestor shall have ten (10) days from receipt of the denial of the variance to seek an appeal in writing. Within thirty (30) days of the written request for an appeal from the denial of a variance, the director shall hear the appeal. The requestor shall be informed in writing of the time, date and place where such appeal shall be heard. The requestor and/or his authorized representatives may present evidence to the director why such appeal should be granted. The director shall inform the requestor within thirty (30) days of the date of the hearing of the appeal whether the appeal has been granted or denied. The determination of the director shall be final and shall be in writing. If a judicial appeal is pursued, applicant must take such appeal to district court or other court of competent jurisdiction within thirty (30) days of the director's final determination, which further appeal shall be pursued under appropriate standards of the substantial evidence rule.

(5) ***Variance qualifications***. Variances to the regulated activities in this division 1 may be issued through the department of conservation's variance administrator provided that the general intent of this division has been met, and compliance with article IV, division 1, is proven to be impracticable to accomplish and to cause unnecessary hardship. The criteria to determine hardship shall include, but not be limited to, a showing of level of capital outlay and technical complexity in relation to conservation benefit to be derived, and time and effort required to accomplish compliance with this division.

(6) ***Specific criteria to be used for the granting of variances.*** The SAWS director of conservation shall also develop specific criteria to be used for the granting of variances from the provisions of this division, which are appropriate to the provision for which a variance is being sought. Such criteria shall be applied equally to each request for variance under a particular provision. A requestor shall be furnished with the criteria to be utilized by the administrator and/or director prior to his/her variance application and/or appeal being heard.
(Ord. No. 100322, § 1(Att. A), 1-20-05)

Sec. 34-277. Enforcement.

(a) The president/CEO or his designee of the San Antonio Water System is hereby authorized to enforce this division in the manner and to the extent allowed by law, including, but not limited to, filing complaints with the city municipal prosecutor's office for such violations, serving notices of violations of this division and filing civil enforcement actions. Such authorization does not diminish the city attorney's authority in regard to enforcement of chapter 34 provisions.

(b) Presumption and exception. For purposes of this division, it shall be presumed that the person, in whose name a water meter connection is registered with the water purveyor servicing the property, is the

responsible party who has made, caused, allowed, or permitted a violation of the provisions of this division. Proof that the particular premises had a water meter connection registered in the name of the defendant cited in a criminal complaint filed pursuant to this division shall constitute a prima facie presumption that the defendant is a person who made, caused, allowed or permitted a violation pursuant to the provisions of this division. [Exception to this presumption is found in subsection 34-273(2), wherein a city, whose premises are used by a tenant/lessee, is generally not responsible for the tenant/lessee's compliance. In such cases the tenant/lessee of the city is responsible for compliance and the city shall have no duty to enforce against the tenant/lessee except to the extent the city's municipal courts may be fully utilized by the SAWS enforcement officers or other duly authorized governmental personnel charged with enforcement duties.]

(c) The president/CEO or his or her designee is authorized and instructed to commence any action, in law or in equity, including the filing of criminal charges, deemed necessary for the purpose of enforcing this division. The San Antonio Water System president/CEO or the designee may seek civil penalties, as may be allowed by statute, and any other legal or equitable relief available under common law, Chapter 54 of the Texas Local Government Code as it may be amended to address the subject matter of this division, or any other applicable city, state or federal code or statute.

(d) Criminal. Any person violating any provision of this division 1 of article IV shall be guilty of a class C misdemeanor and upon citation and conviction, shall be punished by a fine not less than fifty dollars ($50.00) and not more than one hundred dollars ($100.00) for the first offense; a fine not less than two hundred and fifty dollars ($250.00) and not more than five hundred dollars ($500.00) for the second offense; a fine of not less than one thousand dollars ($1,000.00) and not more than two thousand dollars ($2,000) for the third and additional offenses. Each violation of a particular section of this division shall constitute a separate offense, and each day an offense continues shall be considered a new violation for purposes of enforcing this division.

(e) Civil. Civil penalties, imposed by courts of competent jurisdiction in civil actions for violations of this division, may also be assessed as may be allowed by applicable state law in any amount to be authorized by the state. Under Chapter 54 of the Texas Local Government Code, the SAWS and the office of the city attorney may presently pursue civil enforcement for injunctive relief and the imposition of one thousand dollars ($1,000.00) per day civil penalties appropriately imposed by the Court. This statutory remedy is in addition to the city's common law right to bring civil actions for injunctive relief to stop harmful acts, independent of authority found in the Texas Local Government Code.

(f) If, for any reason, any section, sentence, clause or part of this division is held legally invalid, such judgment shall not prejudice, affect, impair or invalidate the remaining sections of this division, but shall be confined to the specific section, sentence, clause, or part of this division held legally invalid.
(Ord. No. 100322, § 1(Att. A), 1-20-05)
Secs. 34-278--34-286. Reserved.

DIVISION 2. WATER WASTE ENFORCEMENT*

***Editor's note:** Ord. No. 92179, § 1, adopted July 27, 2000, amended Div. 2 in it's entirety, in effect repealing and reenacting said division to read as herein setout. The former Div. 2, §§ 34-287--34-300 pertained to wasting water and derived from Ord. No. 17390, §§1-8, adopted March 20, 1952; Ord. No. 17692, § 1, adopted May

29, 1952; Code 1959, §§41-30--41-36; Ord. No. 80574, § 7, adopted Aug. 4, 1994; Ord. No. 83703, § 1, adopted Feb. 29, 1996.

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Sec. 34-287. Definitions.

As used in this article, the following terms shall have the following meanings:

Beneficial use. The amount of water that is economically necessary for a purpose not otherwise prohibited by the city, state or federal law or regulation, when reasonable intelligence and reasonable diligence is used in applying water for that purpose.

Impervious surface area. Any structure or any street, driveway, sidewalk, patio or other surface area covered with asphalt, concrete, brick, paving, tile or other material preventing water to penetrate the ground.

Landscape watering. Water to any member of the plant kingdom, including any tree, shrub, vine, herb, flower, succulent, groundcover, grass or turf species, that is growing or has been planted out of doors.

Person. Any individual, corporation (including a government corporation), organization, state or federal governmental subdivision or agency, political subdivision of a state, interstate agency or body, business, trust, partnership, limited partnership, association, firm, company, joint stock company, joint venture, commission or any other legal entity.

Prescribed hours for sprinkling. Between the hours of 12:00 a.m. and 10:00 a.m. and 8:00 p.m. and midnight when the Aquifer Management Plan, Article IV, Division 4 is not in effect, and during the hours specified therein when the Aquifer Management Plan is in effect.

SAWS. San Antonio Water System.

Waste. Water without obtaining maximum beneficial use thereof. Waste shall also include, but not be limited to, causing, suffering, or permitting a flow of water used for landscape watering to run into any river, creek or other natural water course or drain, superficial or underground channel, bayou, or unto any sanitary or storm sewer, any street, road or highway or other impervious surface area, or upon the lands of another person or upon public lands. Waste shall also include, but not be limited to, any discharge of water used for commercial, industrial, municipal or domestic purposes to any storm, sanitary sewer, or septic system without the user first having obtained maximum beneficial use thereof. Waste shall also include, but not be limited to, failure to repair any controllable leak on property owned by any registered meter holder.

Water. Include, but not be limited to potable water supplied by a water purveyor, potable water withdrawn from any groundwater well, surface water from any river, creek, natural watercourse, pond, lake or reservoir, and recycled water supplied by a water purveyor.
(Ord. No. 92179, § 1, 7-27-00; Ord. No. 92503, § 1, 9-14-00)

Sec. 34-288. Violations.

It shall be a violation punishable by city municipal fine for any San Antonio Water System water and/or waste water service customer residing or doing business within the corporate limits of the city and its extraterritorial jurisdiction, to intentionally, knowingly, recklessly, or criminally negligently to allow or cause water waste, to allow or cause landscape watering outside the prescribed hours for landscape watering, or to allow or cause any violation of any provision of this division or of the Aquifer Management Plan, Article IV, Division 4.
(Ord. No. 92179, § 1, 7-27-00; Ord. No. 2008-10-02-0885, § 3(Exh. A), 10-2-08)

Sec. 34-289. Continued violations.

At locations of repeated or continued violations, the President/CEO of the San

Antonio water system shall have the authority to discontinue the supply of potable water to the registered meter holder.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-290. Enforcement personnel.

The President/CEO or the designee of the San Antonio water system is hereby authorized to enforce this division in the manner and to the extent allowed by law, including, but not limited to, filing complaints with the city municipal prosecutor's office for such violations, serving notices of violations of this division and filing civil enforcement actions.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-291. Education and enforcement.

As the success of conservation generally, and specifically of this division and the Aquifer Management Plan, Article IV, Division 4, depends largely on public cooperation, San Antonio water system policies shall implement customer education programs as a primary enforcement tool and shall establish and maintain a water conservation "hot line," so that the public may provide the San Antonio water system with information relating to violators.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-292. Defenses to prosecution.

(a) It shall be a defense to prosecution that landscape watering was performed on any plant or seed planted in or transplanted to an area within such period of time as to accomplish a reasonable establishment and maintenance of growth, generally three weeks.

(b) It shall be a defense to prosecution that landscape watering was performed by a commercial enterprise in the business of growing or maintaining plants for sale, such as plant nurseries; provided, however, that such landscape watering shall be performed solely for the establishment, growth, and maintenance of such plants and not wasted.

(Ord. No. 92179, § 1, 7-27-00; Ord. No. 92503, § 1, 9-14-00)

Sec. 34-293. Registered water meter user presumed liable.

For purposes of this division, in any case where water has been used in a manner contrary to any provision of this division or of the Aquifer Management Plan, Article IV, Division 4, it shall be presumed that the person in whose name a water meter connection is registered with the water purveyor servicing the property, has intentionally, knowingly, recklessly, or negligently made, caused, used or permitted to be used, the water in such a contrary manner. Proof that the particular premises had a water meter connection registered in the name of the defendant cited in a criminal complaint filed pursuant to this division shall constitute a*prima facie* presumption that the defendant is a person who made, caused, used or permitted to be used, water in a manner contrary to any provision of this division or of the Aquifer Management Plan, Article IV, Division 4.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-294. Additional enforcement remedies.

The President/CEO or his or her designee is authorized and instructed to commence any action, in law or in equity, including the filing of criminal charges, deemed necessary for the purpose of enforcing this division. The San Antonio water system President/CEO or the designee may seek civil penalties and any other legal or equitable relief available under common law, Chapter 54 of the Texas Local Government Code or any other applicable city, state or federal code or statute.
(Ord. No. 92179, § 1, 7-27-00; Ord. No. 92503, § 1, 9-14-00)

Sec. 34-295. Penalties.

Criminal. Any person violating any provision of this division or of the Aquifer Management Plan, Article IV, Division 4,

shall be guilty of misdemeanor and upon citation therefore and conviction thereof, shall be punished by a fine not less than fifty dollars ($50.00) and not more than one hundred dollars ($100.00) for the first offense, a fine not less than two hundred and fifty dollars ($250.00) and not more than five hundred dollars ($500.00) for the second offense, and a fine not less than one thousand dollars ($1,000.00) and not more than two thousand dollars ($2,000.00) for the third or any additional offense. Each violation of a particular section of this division or of the Aquifer Management Plan Article IV, Division 4, shall constitute a separate offense, and each day an offense continues shall be considered a new violation for purposes of enforcing this division.

Civil. Civil penalties for violations of this division or of the Aquifer Management Plan, Article IV, Division 4, may also be assessed as allowed by applicable state law in an amount not to exceed one thousand dollars ($1,000.00) per violation. Each violation of a particular section of this division or of the Aquifer Management Plan Article IV, Division 4, shall constitute a separate violation, and each day a violation continues shall be considered a new violation for purposes of enforcing this division.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-296. Nuisance.

The violation of any part of this division shall be a nuisance which may be abated and enjoined by the San Antonio water system. Any person creating a public nuisance shall be subject to the provision of the Code governing such nuisances, including reimbursing the San Antonio water system for any costs incurred in removing, abating or remedying said nuisance. The owner of any property where said nuisance has occurred shall be liable to the city, acting through and on behalf of the San Antonio water system, for the cost of such abatement and shall pay such cost on demand and the city, acting through and on behalf of the San Antonio water system, shall have a right to file a lien on the property to secure payment of the cost of such abatement.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-297. Access to premises.

The San Antonio water system and all persons or agents employed thereby shall, at all reasonable hours, have free access to premises to ascertain if water is being wasted within the corporate limits of the city or the extent of jurisdictional authority and whether provisions of the Aquifer Management Plan Article IV, Division 4, have been, and are being, complied with in all respects.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-298. Access to information.

Any water purveyor operating within the corporate limit of the city shall provide enforcement personnel of the San Antonio water system, upon request, with the identity, mailing address and telephone number of any person in whose name a water meter is registered or customer account is maintained.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-299. Severability.

If, for any reason, any section, sentence, clause or part of this division is held legally invalid, such judgement shall not prejudice, affect, impair or invalidate the remaining sections of this division, but shall be confined to the specific section, sentence, clause, or part of this division held legally invalid.
(Ord. No. 92179, § 1, 7-27-00)

Sec. 34-300. This article to prevail if conflict.

In the event any section of this article conflicts in effect or application with any other section of the Code or ordinance, the section(s) of this division shall prevail.
(Ord. No. 92179, § 1, 7-27-00)

DIVISION 3. RESERVED*

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***Editor's note:** Ord. No. 92179, § 1, adopted July 27, 2000, repealed Div. 3, §§ 34-301--34-309, which pertained to restrictions on landscape watering, and derived from Ord. No. 80574, § 6, adopted Aug. 4, 1994.

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Secs. 34-301--34-315. Reserved.

DIVISION 4. DROUGHT MANAGEMENT PLAN*

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***Editor's note:** Ord. No. 2007-02-08-0149, § 1(Exh. A), adopted February 8, 2007, amended division 4 in its entirety to read as herein set out. Formerly, division 4 pertained to the aquifer management plan, and derived from Ord. No. 80574, § 12, adopted August 4, 1994; Ord. No. 82533, § 1, adopted July 20, 1995; Ord. No. 83703, §§ 2--5, adopted February 29, 1996; Ord. No. 83860, §§ 2--7, adopted March 28, 1996; Ord. No. 84082, §§ 1, 2, adopted May 9, 1996; Ord. No. 84286, § 6, adopted July 18, 1996; Ord. No. 85945, § 1, adopted April 24, 1997; Ord. No. 91738, § 1, adopted May 4, 2000; Ord. No. 92179, § 1, adopted July 27, 2000; Ord. No. 92503, § 1, adopted September 14, 2000.

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Sec. 34-316. Adoption of a drought management plan, water use reduction measures, and aquifer stage conditions applicable system-wide, including within the corporate limits of the city and its extraterritorial jurisdiction.

The drought management plan, including the water use reduction measures and associated implementation conditions set out therein, is hereby adopted and applicable throughout the San Antonio Water System water and waste water service area, including within the corporate limits of the city and its extraterritorial jurisdiction. All San Antonio Water System water and/or waste water service customers shall comply with the provisions of this division.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07; Ord. No. 2008-10-02-0885, § 3(Exh. A), 10-2-08)

***Editor's note:** Ord. No. 2008-10-02-0885, § 3(Exh. A), adopted October 2, 2008, changed the title of § 34-316 from "Adoption of a drought management plan, water use reduction measures, and aquifer stage conditions" to "Adoption of a drought management plan, water use reduction measures, and aquifer stage conditions applicable system-wide, including within the corporate limits of the city and its extraterritorial jurisdiction."

Sec. 34-317. Definitions.

Advanced plan means, submitted to and approved by SAWS, an irrigation schedule based on precipitation rates for irrigation systems that allows athletic fields to be irrigated more than one day a week.

Aesthetic use means the use of water for artificially created fountains, waterfalls, lakes, streams, rivers, lagoons, and ponds, where such use is primarily ornamental and serves no other functional purpose.

Agricultural irrigation means irrigation for the purpose of growing crops commercially for human consumption or to use as feed for livestock or poultry.

Athletic field means a sports playing field, the essential feature of which is turf grass, used primarily for organized sports for schools, professional sports, or sanctioned league play.

Base usage means the average monthly total water usage for the three (3) lowest months of November and December and the following January and February during each of the three (3) consecutive twelve-month

periods preceding the commencement of the user's use of water.

Basic plan means, submitted to and approved by SAWS, an irrigation schedule for athletic fields that allows each athletic field at a particular location to be irrigated one day a week.

Bucket means a deep, cylindrical container holding five (5) gallons or less, used singly by one person.

Certified vehicle wash facility means a vehicle wash facility that meets the requirements of SAWS certified vehicle wash program.

Computer controlled irrigation system (CCIS) means a system comprised of a computer controller (digital operating system), software, interface modules, satellite field controllers, soil sensors, weather station, or similar devices that is capable of achieving maximum efficiency and conservation in the application of water for irrigation. A CCIS, at a minimum, should be designed to:
(1) Prevent over watering, flooding, pooling, evaporation and run-off, and
(2) Prohibit sprinkler system from applying water at an rate exceeding the soil holding capacity of the land under irrigation.

Conforming means a golf course that has a CCIS in place and is utilizing the system to achieve maximum conservation and the goals of this division. Conforming facilities shall have a conservation plan approved and on file with SAWS.

Drip irrigation means an irrigation system (drip, porous pipe, etc.) that applies water at low-flow levels directly to the roots of the plant.

Drought, for the purposes of this division, is not intended to be limited to any meteorological definition of the term. "Drought" is intended to have broad meaning and refers to any condition, whether man-made or natural, where the available water supply or resources are not meeting the water demand, or if the water supply or resources are being depicted at a faster rate than they are being replenished.

Evapotranspiration rate (ET rate) means the rate which the combination of evaporation from soil surface and transpiration from vegetation will occur for specific climatic conditions.

Existing landscaping plant means a landscaping plant existing after such period of time as to accomplish an establishment and maintenance of growth.

Fountain means an artificially created jet or stream of water, a structure, often decorative, from which a jet or stream of water issues.

Golf course means an irrigated and landscaped playing area made up of greens, tees, fairways, roughs and related areas used for the playing of golf.

Hand-held hose means a hose physically held by one person, fitted with a manual or automatic shutoff nozzle.

Health care facility means any hospital, clinic, nursing home or other health care or medical research facility.

Hose-end sprinkler means a sprinkler that applies water to landscape plants that is piped through a flexible, movable hose.

Household use means the use of water, other than uses in the outdoor category, for personal needs or for household purposes, such as drinking, bathing, heating, cooking, sanitation or cleaning, whether the use occurs in a residence or in a commercial or industrial facility.

Industrial use means the use of water for or in connection with commercial or industrial activities, including manufacturing, bottling, brewing, food processing, scientific research

and technology, recycling, production of concrete, asphalt, and cement, commercial uses of water for tourism, entertainment, and hotel or motel lodging, generation of power other than hydroelectric, and other business activities.

Irrigation suspension program (ISP) means a program administered by the Edwards Aquifer Authority pursuant to which agricultural irrigators within the Edwards Aquifer Authority's boundaries voluntarily agree to suspend some irrigation use of the underground water from the Edwards Aquifer in consideration for payments voluntarily funded by ISP participants.

Irrigation system, also referred to as an in-ground or permanent irrigation system, means a system with fixed pipes and emitters or heads the apply water to landscape plants.

Lake, lagoon **or** ***pond,*** for the purposes of this division, is an artificially created body of fresh or salt water.

Landscape watering means the application of water to grow or maintain landscaping plants, such as flowers, ground covers, turf or grasses (other than golf courses or athletic fields), shrubs, and trees, but for purposes of this division does not include essential use without waste of water by a commercial nursery to the extent the water is used for production rather than decorative landscaping.

Landscaping plant means any member of the kingdom plantae, including any tree, shrub, vine, herb, flower, succulent, groundcover or grass species, that grows or has been planted out-of-doors.

Livestock means cattle, sheep, goats, hogs, poultry, horses, and game, domestic, exotic and other animals and birds, including zoo animals, used for commercial or personal purposes.

Livestock use means the use of water for drinking by or washing of livestock.

Maintenance level means the level of water in a swimming pool required for proper operation of circulation and filter equipment for the swimming pool.

msl means elevation above mean sea level.

Mulch means any material such as bark, leaves, straw or other materials left loose and applied to the soil surface to reduce evaporation.

New landscape means any contiguous area where new landscape plant(s) are installed where no other planted plants currently exists. A new plant(s) added to an existing landscape is not considered a new landscape for the purposes of an establishment variance.

New landscaping plant means any plant or seed planted in or transplanted to an area within such period of time as to accomplish a reasonable establishment and maintenance of growth. Application of gross seed to an existing stand of grass or turf is not considered new landscaping for the purposes of this chapter.

Non-conforming means a golf course that is not conforming. Non-conforming golf courses must follow the reduction measures and guidelines set forth in section 34-332.

Organic material means organic substances in differing stages of decay.

Other outdoor use means the use of water outdoors for the maintenance, cleaning and washing of structure and mobile equipment, including automobiles and boats, or the washing of streets, driveways, sidewalks, patios and other similar areas.

Park means a tract of land, other than a golf course, maintained by a city, private organization, or individual, as a place of beauty or public recreation.

Pervious surface means any ground surface which can absorb water or other liquids.

Power production use means the use of water for steam generation and the use of water for cooling and for replenishment of cooling reservoirs.

Precipitation rate means the speed at which a sprinkler or irrigation system applies water. Precipitation rates are measured in inches per hour or inches per minute.

Private residential swimming pool. (See "swimming pool").

Property address means the street address of a property, unless multiple street addresses are served by a single meter, in which case the mailing address will be used.

Public means municipally-owned or operated facilities.

Public swimming pool. (See "swimming pool").

River, stream **or** ***brook,*** for the purposes of this division 4, means an artificially created flow of water in a channel or bed, as a brook, rivulet or small river.

SAWS means the San Antonio Water System.

Soaker hose means a flexible hose that is designed to slowly emit water across the entire length based on water pressure, and connect directly to a flexible hose or spigot. Does not include hose that by design or use send a fine spray in the air.

Soil holding capacity means the amount of moisture in the soil that can occur without becoming saturated.

Sprinkler means an emitter that applies water to the landscape plants in a stream or spray that travels through the air. Sprinkler irrigation can be applied by an irrigation system or hose-end sprayer or a hose that sprays water in the air.

Swimming pool means any structure, basin, chamber, or tank including hot tubs, containing an artificial body of water for swimming, diving, or recreational bathing, and having a depth of two (2) feet or more at any point.

Private residential swimming pool means any swimming pool located on private property under the control of the homeowner, the use of which is limited to swimming or bathing by the homeowner's family or invited guests.

Public swimming pool means any swimming pool, other than a private residential swimming pool, intended to be used collectively by persons for swimming or bathing, operated by any person as defined herein, whether owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for such use. The term includes, but is not limited to, apartment community pools, condominium association pools and community association pools.

TDS means total dissolved solids.

Trigger level means the mean sea level of the Edwards Aquifer as indicated by the J-17 index well.

Turf means a surface layer of earth containing mowed grass with roots.

Vehicle wash facility means a place or business intended for the sole purpose of washing cars and/or other motor vehicles. Such establishments shall utilize self service, rollover in-bay or conveyor washing technology with catchments' systems and oil-water separators that are intended to treat wastewater prior to entering the sanitary sewer. Such systems shall be designed and maintained to prevent runoff into streets,

storm drains and/or local creeks and tributaries.

Vegetable garden means any non-commercial vegetable garden planted primarily for household use; "non-commercial" includes incidental direct selling of produce from such a vegetable garden to the public.

Water conservation plan means the water conservation plan must include proof of irrigation efficiency of sixty (60) percent or greater and demonstrate specific measures to be taken to reduce consumption to meet the reduction goal established for each stage I, II, III, and IV. A plan should also include precipitation rates and irrigation schedules with run times. SAWS may, on a case by case basis, waive the requirements for irrigation efficiency and/or submission of a water conservation plan.

Waterfall, for the purposes of this division, means an artificially created steep descent of water from a height, cascade.

Water utility use means water used for withdrawal, treatment, remediation, transmission and distribution by potable water system.

Watering day means a day designated for landscape watering limited to the standard 24-hour period of 12:00 a.m. to midnight. Thus, if it is stage I and Wednesday is a designated watering day, the period of time referenced is Wednesday morning between midnight to 10:00 a.m., and Wednesday evening between 8:00 p.m. and midnight.

Zonal irrigation system means an irrigation system which segregates by station areas of shrubs, ground cover, bedding plants, and turf to accommodate a diversity of watering requirements.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-318. Bases of water use reduction measures and aquifer stage conditions.

The water use reduction measures shall be based on the aquifer stage conditions or other condition considerations specified in section 34-319. The aquifer stage conditions shall be based on the Edwards Aquifer water levels in well AY-68-37-203 in the city (also known as "Dodd Field Test Well" or "J-17") as set out in section 34-322, or on aquifer water quality or other aquifer, seasonal or weather conditions not based on water levels in J-17 (set out in section 34-324).
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-319. Implementation of water use reduction measures and stages, generally.

When the aquifer falls to six hundred sixty-five (665) feet above msl, city and SAWS staff shall begin preparations for public awareness, education and enforcement of the respective stage provisions. Stage I water use reduction measures shall be declared to be in effect when the aquifer level in the index well J-17 falls to six hundred sixty (660) feet above msl. Stage II water use reduction measures shall be declared to be in effect when the aquifer level in the index well J-17 falls to six hundred fifty (650) feet above msl. Subsequent stages of the water use reduction measures shall be automatically implemented when the conditions set out in sections 34-322 and 34-324 are met, including a condition that if the total supply of water from the Edwards Aquifer and other available sources is insufficient to meet customer demand, while complying with applicable regulations governing water supply withdrawals. The determination whether SAWS is able to comply with the applicable regulations governing water supply withdrawals shall be based upon consideration of pumping trends, seasonal adjustments and current and forecast precipitation. After a monitoring period of thirty (30) days and due

consideration of all of the above described conditions, the city manager, or designee, in consultation with SAWS president/CEO or designee, may declare later stages of drought or delay a later stage of drought. Specific water use reduction measures are set out in section 34-332 and shall cover the categories of regulated uses, applicable stages and corresponding required water use reduction measures.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-320. Declaration of water use reduction measures, stages in effect; notice by publication required.

(a) The city manager, in consultation with SAWS, is hereby authorized to declare that each "trigger level" or other condition has been reached as described in section 34-322 (table I) and that the water use reduction measures and each respective stage are in effect.
(b) Notices of the implementation and termination of the water use reduction measures and each of the various stages, as appropriate, shall be publicly announced and published in a daily newspaper for a minimum of one (1) day. The implementation or termination of the measures and each of the stages shall become effective immediately upon publication of the respective notice.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-321. Water advisory council to be organized.

When the water use reduction measures are declared to be in effect, a water advisory council, composed of water purveyors and other interested jurisdictions, shall meet. This group shall provide a forum for information exchange and cooperation to ensure that the aquifer management plan is understood and equitably implemented.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-322. Declaration and termination of stages I through IV.

Declaration and termination of stages I through IV shall occur according to the following schedule:

Table I

TABLE INSET:

Stage	*Conditions for Declaration*	*Conditions for Termination*
I	When the Edwards Aquifer level in the index well J-17 falls to six hundred sixty (660) feet above msl.	When the Edwards Aquifer levels remain above six hundred sixty (660) msl. for thirty (30) consecutive days and it is determine conditions warrant termination of the measures (Sec. 34-325).
II	When the Edwards Aquifer level in the index well J-17 falls to six hundred fifty (650) feet above msl.	When the Edwards Aquifer levels remain above six hundred fifty (650) msl. for thirty (30) consecutive days and it is determine conditions warrant termination of the measures (Sec. 34-325). Conditions will determine if all restrictions are terminated or if a previous less restrictive stage will apply.
III	A. When the Edwards Aquifer level in the index well J-17 falls to six hundred forty (640) feet above msl. B. The total supply of water from the Edwards Aquifer and other available sources is insufficient to meet customer demand while complying with applicable regulations governing water supply withdrawals.	When the Edwards Aquifer levels remain above six hundred forty (640) msl. for thirty (30) consecutive days and it is determine conditions warrant termination of the measures. Conditions will determine if all restrictions are terminated or if a previous less restrictive stage will apply (Sec. 34-325).
IV	A. When the Edwards Aquifer level in the index well J-17 falls to six hundred thirty (630) feet above msl. B. After a 30-day monitoring period once stage III is declared, the total supply of water from the Edwards Aquifer and other available sources is insufficient to meet customer demand while complying with applicable regulations governing water supply withdrawals.	When the Edwards Aquifer levels remain above six hundred thirty (630) msl. for thirty (30) consecutive days and it is determine conditions warrant termination of the measures. Conditions will determine if all restrictions are terminated or if a previous less restrictive Stage will apply (Sec. 34-325).

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-323. Designated landscape irrigation times and days.

During any period when stage restrictions have been declared to be in effect, irrigation with a sprinkler or irrigation system of existing landscape on any property (other than golf courses and

athletic fields, the restrictions for which are set out in section 34-332) may occur only on certain designated days and at certain times, as follows:

(1) For stage I, II, III, and IV the landscape irrigation days for residential and commercial properties will be according to the street address and according to the following schedule. If the last digit of the street address ends in:

0 or 1 the irrigation day is Monday,
2 or 3 the irrigation day is Tuesday,
4 or 5 the irrigation day is Wednesday,
6 or 7 the irrigation day is Thursday,
8 or 9 the irrigation day is Friday.

If there is no street address associated with the property such as a parkway or if there is more than one (1) street address associated with a single contiguous property the irrigation day is Wednesday.

(2) For stage I the following times and associated irrigation methods apply: Irrigation with a hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection (1) between the hours of 12:00 a.m. to 10:00 a.m. and 8:00 p.m. to midnight. Landscape irrigation with a soaker hose, handheld hose, drip irrigation system or five-gallon bucket is allowed at any time on any day.

(3) For stage II the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection (1) between the hours of 3:00 a.m. to 8:00 a.m. and 8:00 p.m. to 10:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed during stage II hours on any day. Landscape irrigation with a handheld hose is allowed at any time on any day.

(4) For stage III, the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection (1) every other week beginning on the second Monday after the stage III has been declared, between the hours of 3:00 a.m. to 8:00 a.m. and 8:00 p.m. to 10:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed on every Monday, Wednesday and Friday during stage III hours. Landscape irrigation with a handheld hose is allowed at any time on any day.

(5) For stage IV, stage III landscape irrigation restrictions remain in effect. In addition, a drought surcharge is assessed on all water accounts of SAWS, in accordance with section 34-128. Additional restrictions on water use may be established at the discretion of the city council.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-324. Implementation of additional water use reduction measures.

(a) Implementation of additional water use reduction measures may be based on consideration of aquifer water quality or on other aquifer, seasonal or weather conditions not based on water levels in J-17, or other conditions as determined by the city.

(b) Whenever aquifer quality measures thirty (30) percent TDS above historical average and above the maximum TDS value for any public supply water well, the city manager or designee, in consultation with SAWS president/CEO or designee, shall establish appropriate additional measures to protect the aquifer.

(c) Regardless of consideration of aquifer quality, whenever city council may determine that other aquifer, seasonal, or weather conditions not based on water levels in J-17 warrant, the city council may also declare the city impose additional restrictions for all water uses.

(d) A prohibition of sprinkler irrigation may be declared by the city manager, in consultation with the city council, the San Antonio Water System's board of trustees and the Edwards Aquifer Authority's board of directors when the Edwards Aquifer Authority's board of directors have declared a prohibition of all sprinkler irrigation throughout the entire Edwards Aquifer region.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-325. Termination of water use reduction measures, stages.

When the aquifer level at J-17 rises to six hundred sixty (660) feet msl during a period when the water use reduction measures have been declared in effect, the city manager, or his or her designee, in consultation with SAWS president/CEO, or designee, shall monitor consistency of aquifer levels for the next thirty (30) days to determine if conditions warrant termination of the measures, and such determination shall include consideration of pumpage trends, seasonal adjustments, and current and forecast precipitation unless conditions significantly change to warrant an earlier review for stage termination. After this monitoring period and due consideration of all of the above-described conditions, the city manager, or designee, in consultation with SAWS president/CEO, or designee, may declare the measures terminated.

Notice of the termination of the water use reduction measures and each of its various stages, as appropriate, shall be publicly announced and published in a daily newspaper for a minimum of one (1) day. Termination of the measures and each of its stages shall become effective immediately upon publication of the respective notice.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Secs. 34-326--34-331. Reserved.

Sec. 34-332. Specific water use reduction measures.

Specific water use reduction measures, their corresponding stages and scope are set out in table A stage I, table B stage II, table C stage III and table D stage IV, below

.

Table A--Stage I Restrictions

TABLE INSET:

Stage	***Measures For***	***Scope of Restrictions***
I	Essential Services	Fire-fighting and medical uses--no restrictions. Reductions in fire hydrant and sewer line flushing encouraged.
I	Water Utility Use	Water utilities are encouraged to implement voluntary measures, such as improving leak detection surveys and repair programs and stabilizing and equalizing system pressure.
I	Power Production	Water used for power production shall be voluntarily reduced.
I	Military	Compliance with mandatory reduction measures for those uses

		in the outdoor, essential and utility categories.
I	Agriculture	Reduction of water use by any means available is encouraged.
I	Live Stock Use	Reduction of water use by any means available is encouraged.
I	Industrial, Commercial, and Other	A. Reduction of water use by any means available is encouraged. Compliance with the mandatory demand reduction measures is required for those uses in the outdoor category, including landscape watering, swimming pools, hot tubs and similar facilities, golf courses, aesthetic uses such as fountains; such restrictions specifically include industrial users, as well as all others. B. Use of gray water, treated wastewater or reuse water, cooling tower blow down, condensate water is a defense to prosecution. Alternate on-site reclaimed sources may be approved through variance on a case by case basis. C. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.
I	Hotels, Motels, Bed and Breakfasts	Hotels, motels, and B&B's encouraged to voluntarily offer the option of a "no linen/towel change" program.
I	Households	Reduction of water use by any means available is encouraged. Compliance with the mandatory demand reduction measures shall be achieved for those uses in the outdoor category, such as landscape watering, swimming pools, hot tubs, pressure washing and similar facilities.
I	Swimming Pools, Hot Tubs	All swimming pools other than public swimming pools must be covered with an effective evaporation cover or screen or evaporation shields covering at least twenty-five (25) percent of the surface of the pool when the pool is not in active use. Active use includes necessary maintenance that requires removal of the cover, screen, or shields. Active use of public, commercial and apartment pools is whenever the pool is not officially closed.
I	Aesthetic Water Features	A. Outside and indoor prohibited. The one hundred (100) percent use of treated wastewater, condensate, or cooling tower blow down is defense to prosecution under this paragraph. Alternate on-site reclaimed sources may be approved through variance on a case-by-case basis. B. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used signs identifying this property as using

		recycled or reclaimed water source must be posted on site at a location where the general public can view it.
I	Pressure or Power Washing	Use of water to wash any impervious outdoor ground covering, such as a parking lot, driveway, street or sidewalk, is prohibited. The washing of any impervious surfaces for immediate health and safety shall be a defense to prosecution under this paragraph. A variance from SAWS should be obtained for any washing of impervious surfaces. No run-off leading to a storm drain is allowed. Commercial pressure or power washers must be registered to work in the city (section 34-272.1).
I	Vehicle and Equipment Washing	A. Citizens are encouraged to wash their vehicles no more than twice a month. B. Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned residential landscape sprinkling watering days before 10:00 a.m. and after 8:00 p.m. (subsections 34-323(1)--(7)) with a pressure washer, hand-held hose equipped with an automatic shut-off nozzle, or bucket of five (5) gallons or less, but is prohibited between the hours of 10:00 a.m. and 8:00 p.m. C. Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety. D. Use of gray water, condensate water, cooling tower blow down treated wastewater or recycled water is a defense to prosecution and may be use to irrigate any day before 10:00 a.m. and after 8:00 p.m. Alternate on-site reclaimed sources may be approved through variance for the SAWS Conservation Department on a case by case basis.
I	Landscape Irrigation for Existing Plants	A. Landscape watering using sprinkler or irrigation systems is permitted only on designated landscape watering days (subsection 34-323(1)). For stage I the following times and associated irrigation methods apply: Irrigation with a hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection 34-323(1) between the hours of 12:00 a.m. to 10:00 a.m. and 8:00 p.m. to midnight. Landscape irrigation with a soaker hose, handheld hose, drip irrigation system or five (5) gallon bucket is allowed at any time on any day. B. A user may file with SAWS a request for an exception to the designated days and times. The request must include: (1) a statement indicating compelling reasons why the user is unable to meet the specific designated watering times and days; (2) a water conservation plan demonstrating a significant overall reduction of water use, and (3) evidence of having filed with SAWS the annual irrigation check up required for properties that are five (5) acres or more and have in-ground irrigation

		(section 34-273.2). The water conservation plan must also include proof of irrigation efficiency of sixty (60) percent or greater and demonstrate specific measures to be taken to reduce consumption to meet the reduction goal established for stage I, II, III, and IV. SAWS may, on a case by case basis, waive the requirements for irrigation efficiency and/or submission of a water conservation plan. Upon the approval of the water conservation plan as set forth herein, the user may be granted an exception. C. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be use to irrigate any day without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis. D. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(7) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.
I	Landscape Irrigation for New Landscapes	A. Landscape watering permitted to maintain adequate growth until established on newly installed landscapes, generally five (5) weeks. Property owners should submit electronically on-line at www.saws.org to the SAWS Conservation Department their name, address where the new landscape is to be installed and the date of installation in order to receive a confirmation electronic email from SAWS. A copy of the confirmation must be posted at a place visible from the street at the property the variance was received at. Thereafter, landscape watering using sprinkler or irrigation systems for landscaping plants is permitted only on the day and times associated with the current stage in effect at the termination of the variance. B. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be use to irrigate any day without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis. C. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(7) signs identifying this property as using recycled or reclaimed water source must be posted on site

		at a location where the general public can view it.
I	Golf Courses	Golf Courses shall be required to submit a water conservation plan and shall have on file with SAWS the annual irrigation check Up as described in section 34-273.2 and shall be defined as "conforming" or "non-conforming" and shall reduce water usage under the following terms: A. All landscape out-of--play areas such as may be found around a club house or entryway shall follow general landscape irrigation restrictions (subsections 34-323(1)--(3)). B. All in-play areas may be irrigated with a sprinkler or irrigation system between the hours of 12:00 a.m. to 10:00 a.m. and 8:00 p.m. to midnight. C. Conforming golf courses shall implement a ten (10) percent reduction in the replacement of daily evapotranspiration rate ("ET rate") or daily soil-holding capacity, achieved by use of an existing and properly operating CCIS (as defined) capable of achieving such water conservation goals. D. A non-conforming golf course shall not use more than 1.8 times the base usage. If not separately metered an irrigation audit showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS. E. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be use to irrigate any day without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis. F. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(5) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.
I	Public Parks	A. Public park owner/operators shall be required to submit a water conservation plan and have on file with the SAWS Conservation Department an irrigation check up as required by section 34-273.2. B. Public parks shall limit irrigation with an irrigation system to those days and times required by subsections 34-323(1)--(3) C. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be use to irrigate any day without waste. Alternate on-site reclaimed

		sources may be approved through variance from the SAWS Conservation Department on a case by case basis. D. If one hundred (1000 percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(3) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.
I	Athletic Fields	A. An athletic field shall either irrigate according to a basic plan or an advance plan. Plans shall be on file and approved by SAWS in advance of use. The advanced plan showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS. A basic plan outlines which day of the week (Monday--Friday) which athletic field would be irrigated. B. All landscape out-of--play areas such as may be found around a club house or entryway shall follow general landscape irrigation restrictions (subsections 34-323(1)--(5)).

Table B--Stage II Restrictions

TABLE INSET:

Stage	***Measures For***	***Scope of Restrictions***
II	In General	Stage I restrictions remain the same except as added to or replaced below.
II	Agriculture	The escape of irrigation tailwater, as that term is commonly used in the agricultural community, is prohibited. Water loss through percolation in transmission canals is prohibited.
II	Hotels, Motels, Bed and Breakfasts	Hotels, motels and B&B's must offer and clearly notify guests of a "no linen/towel change" program.
II	Swimming Pools, Hot Tubs.	Filling of all new and existing swimming pools prohibited, unless at least thirty (30) percent of water obtained from a source other than Edwards Aquifer. Replenishing to maintenance level permitted. Draining permitted only onto pervious surface, or onto pool deck where the water is transmitted directly to a previous surface, only if: 1. Draining excess water from pool due to rain in order to lower water to maintenance level; 2. Repairing, maintaining or replacing pool component that has

		become hazardous; or 3. Repairing pool leak Refilling of public swimming pool permitted only if pool has been drained for the repairs, maintenance or replacement set out in items 2 or 3 above.
II	Landscape Irrigation for Existing Landscapes	Landscape watering using sprinkler or irrigation systems is permitted only on designated landscape watering days (subsection 34-323(1)). For stage II the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection 34-323(1) between the hours of 3:00 a.m. to 8:00 a.m. and 8:00 p.m. to 10:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed during stage II hours on any day. Landscape irrigation with a handheld hose is allowed at any time on any day.
I I	Landscape Irrigation for New Landscapes	A. Landscape watering permitted to maintain adequate growth until established on newly installed landscapes, generally three (3) weeks. Property owners should submit electronically on-line at www.saws.org to the SAWS Conservation Department their name, address where the new landscape is to be installed and the date of installation in order to receive a confirmation electronic email from SAWS. A copy of the confirmation must be posted at a place visible from the street at the property the variance was received at. Thereafter, landscape watering using sprinkler or irrigation systems for landscaping plants is permitted only on the day and times associated with the current stage in effect at the termination of the variance. B. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be use to irrigate any day without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis. C. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(7) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.
II	Golf Courses	Golf Courses shall be required to submit a water conservation plan and shall have on file with SAWS the annual irrigation check up as described in section 34-273.2 and shall be defined as "conforming" or "non-conforming" and shall reduce water

		usage under the following terms: A. All landscape out-of--play areas such as may be found around a club house or entryway shall follow general landscape irrigation restrictions (subsections 34-323(1)--(3). B. All in-play areas may be irrigated with a sprinkler or irrigation system between the hours of 12:00 a.m. to 10:00 a.m. and 8:00 p.m. to midnight. C. Conforming golf courses shall implement a twenty (20) percent reduction in the replacement of daily evapotranspiration rate ("ET rate") or daily soil-holding capacity, achieved by use of an existing and properly operating CCIS (as defined) capable of achieving such water conservation goals. D. A non-conforming golf course shall not use more than 1.6 times the base usage. If not separately metered an irrigation audit showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS. E. The one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow down is a defense to prosecution and may be use to irrigate any day without waste. Alternate on-site reclaimed sources may be approved through variance from the SAWS Conservation Department on a case by case basis. F. If one hundred (100) percent use of gray water, treated wastewater or reuse water, condensate water, cooling tower blow will be used during additional days or hours allowed in subsections 34-323(1)--(3) signs identifying this property as using recycled or reclaimed water source must be posted on site at a location where the general public can view it.

Table C--Stage III Restrictions

TABLE INSET:

Stage	***Measures For***	***Scope of Restrictions***
III	In General	Stage I, II restrictions remain the same except as added to or replaced below.
III	Industrial, Commercial, and Other	Additional reductions may be imposed by the city council if conditions warrant.
III	Hotels, Motels, Bed and Breakfasts	Hotels, motels, B&B's must limit linen/towel changes to once every three (3) nights or for the entire stay, which ever is shorter, except for health and safety.

III	Landscape Irrigation for Existing Landscapes	Landscape watering using sprinkler or irrigation systems is permitted only on designated landscape watering days (subsection 34-323(1)). For stage III the following times and associated irrigation methods apply: Irrigation with a soaker hose, hose-end sprinkler or in-ground irrigation system is allowed on the day specified in subsection 34-323(1) every other week beginning on the second Monday after the stage III has been declared, between the hours of 3:00 a.m. to 8:00 a.m. and 8:00 p.m. to 10:00 p.m. Landscape irrigation with a drip irrigation system or five-gallon bucket is allowed on every Monday, Wednesday and Friday during stage III hours. Landscape irrigation with a handheld hose is allowed at any time on any day.
III	Landscape Irrigation for New Landscapes	A. Installation of new landscapes is permitted only if not more than fifty (50) percent of the available landscape area is planted with turf, all applicable provisions of section 34-274.2 and section 34-275, including proper horticultural practices such as the use of mulch and zonal irrigation systems if a permanent irrigation system is installed and a minimum of four (4) inches of soil under turf. In addition, drip systems in mulched beds are required. B. A user may file with SAWS a request to install more than fifty (50) percent turf. The request must include: (1) a statement or plan describing the landscaping plan; and (2) a statement indicating how the landscaping plan will achieve the goals of this chapter. Upon the approval of the alternate landscaping plan as set forth herein, the user may be granted an exception.
III	Golf Courses	A. A Conforming golf courses shall implement a thirty (30) percent reduction (or twenty (20) percent reduction, if the conforming golf course is an ISP participant) in replacement of daily ET rate or daily soil holding capacity, achieved by use of an existing and properly operating CCIS (as defined) capable of achieving such water conservation goals. B. A non-conforming golf course shall not use more than 1.4 times the base usage. If not separately metered an irrigation audit showing precipitation rates and run times along with a conservation plan shall be submitted and approved by SAWS for the purpose of establishing acceptable irrigation run times and days as approved by SAWS.

Table D--Stage IV Restriction

TABLE INSET:

Stages	***Measures For***	***Scope of Restrictions***

IV	In General	The most restrictive requirements of either Stage I, II, III restrictions remain the same except as added to or replaced below.
IV	Commercial Surcharge	A surcharge is assessed on all irrigation accounts and assumed irrigation (section 34-124) of the San Antonio Water System as described in section 34-128. Surcharge is to remain in effect for a minimum of one (1) complete billing month. The surcharge shall remain in effect if stage IV is still in effect at the beginning of the next billing month.
IV	Residential Surcharge	A surcharge is assessed on all water accounts of the San Antonio Water System as described in section 34-128. Surcharge is to remain in effect for a minimum of one complete billing month. The surcharge shall remain in effect if stage IV is still in effect at the beginning of the next billing month.
IV	Vehicle and Equipment Washing	During Stage IV any vehicle wash facility that is not certified as a SAWS certified vehicle wash facility will not be able to operate. Upon receiving certification vehicle wash facilities may resume operating hours.
IV	Additional Restrictions	Additional restrictions including but not limited to a ban on lawn watering with irrigation systems or hose end sprinklers may be established at the discretion of the city council.

(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-333. Severability.

If, for any reason, any section, sentence, clause or part of this division is held legally invalid, such judgment shall not prejudice, affect, impair or invalidate the remaining sections of this division, but shall be confined to the specific section, sentence, clause, or part of this division held legally invalid.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Sec. 34-334. This division to prevail if conflict.

In the event any section of this division conflicts in effect or application with any other section of a City Code or ordinance, the section(s) of this division shall prevail.
(Ord. No. 2007-02-08-0149, § 1(Exh. A), 2-8-07)

Secs. 34-335--34-350. Reserved.

DIVISION 5. REUSE

Secs. 34-351--34-425. Reserved.

Appendix F: California Urban Water Conservation Council, BMP Biennial Report for 2009-2010

Appendix G: Water Shortage Contingency Plan with Resolution of Adoption

MARINA COAST WATER DISTRICT
WATER SHORTAGE CONTINGENCY PLAN

1.0 INTRODUCTION AND BACKGROUND

This Water Shortage Contingency Plan is developed in compliance with California Water Code Section 10632. Requirements of subsections (a)-(i) are identified below and are accompanied by the required elements and information.

The Marina Coast Water District (MCWD) obtains its water supply from the Salinas Valley Groundwater Basin (SVGB). The SVGB is not adjudicated and provides water for growers, municipalities and other municipal and industrial uses in the Salinas Valley. Due to cumulative basin pumping, coastal aquifers are experiencing seawater intrusion. MCWD continues to work with Monterey County Water Resources Agency (MCWRA) in developing plans to coordinate and encourage preservation of the SVGB aquifers by all municipal and agricultural users.

In 2005, MCWD interconnected its two service areas, Central Marina and the Ord Community. The interconnection has improved system-wide reliability, making maximum use of available water storage tanks in the Ord Community and allowing both areas to be served by any of the six District wells. In 2007, the District consolidated the two systems under a single Public Water System Permit.

MCWD is actively pursuing development of a Regional Water Supply Project, in partnership with the Monterey County Water Resources Agency (MCWRA) and California-American Water Company (CAWC). The Regional Project will develop desalinated water from the seawater-intruded portion of the SVGB. This supply will meet current water demands within the CAWC Monterey service area and future water demands within the MCWD Ord Community. The wells to be installed within the intruded portions of the SVGB are intended to capture seawater along the coast before it can migrate to inland portions of the aquifer. The project also includes a recycled water component that will provide non-potable water for landscape irrigation within the MCWD and CAWC service areas.

One other coordinated effort includes the Water Awareness Committee of Monterey County (WAC). Through the WAC, representatives from several agencies throughout Monterey County work together coordinating conservation and other water awareness efforts including education programs, information booths for special events and public understanding of Monterey County water challenges and opportunities.

California Water Code Section 10632(c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies, including but not limited to, a regional power outage, an earthquake or other disaster.

The MCWD developed and adopted an Emergency Response Plan for emergency and disaster occurrences with guidelines and agreements for cooperative efforts with other State and local agencies, as required by the State Health Department. This Plan contains actions MCWD would initiate in the event of a catastrophic reduction in its water supply.

2.0 STAGES OF ACTION

California Water Code Section 10632(a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

The MCWD developed a five-stage Water Conservation Plan that includes two voluntary and three mandatory stages. Table 1 generally describes the various stages. Specific water supply conditions applicable to each stage, referred to as "triggering mechanisms" herein, are discussed in the next section.

Table 1: Water Conservation Stages and Reduction

Stage	Demand Reduction Goal	Type Program
Stage 1	10% reduction	Voluntary
Stage 2	15% reduction	Voluntary
Stage 3	25% reduction	Mandatory
Stage 4	35% reduction	Mandatory
Stage 5	50%+ reduction	Mandatory
Priorities for use of available water, based on California Water Code Chapter 3 are: 1. Health and Safety - interior residential and fire fighting 2. Commercial, Industrial, and Governmental - maintain jobs & economic base 3. Existing Landscaping - especially trees and shrubs 4. New Demand - projects without permits when shortage declared		

California Water Code Section 10632(b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.

This requirement is oriented toward water supply systems that are primarily supplied via surface waters and therefore can be directly affected by short-term fluctuations in hydrology i.e., drought conditions. MCWD's total current water supply is produced through groundwater pumping from the large SVGB. MCWD supply availability from this basin has not historically varied due to short-term hydrologic conditions. The minimum water supply available within the driest three-year sequence is expected to match demands as discussed in the Urban Water Management Plan.

3.0 TRIGGERING MECHANISMS

The SVGB is currently the most important source of water for MCWD. In 2004, the MCWD's groundwater withdrawals of about 4,600 acre-feet accounted for less than one percent (1%) of the estimated basin-wide annual extractions of roughly 550,000 acre-feet. Given this relatively small percentage, MCWD conservation and contingency management activities can play only a small part within the SVGB. The foremost concern in developing appropriate triggers is achieving the maximum practical protection of an adequate long-term water supply of acceptable quality for MCWD customers. To that end, triggering mechanisms should be tied to factors that, directly or indirectly, have the greatest potential effect on the quality and quantity of available groundwater.

Two general types of threats could cause MCWD to experience water shortages:

1. Unanticipated catastrophic system failure due to an earthquake, terrorist attack or sudden contamination of water supply, or
2. Chronic system shortage due to seawater intrusion reaching water supply wells in concentrations such that those wells would have to be removed from service.

In the case of a catastrophic failure, the MCWD would assess the nature and extent of the failure, and the General Manager would identify the appropriate Conservation Stage in accordance with the expected level of water supply shortage. Should shortages be anticipated in amounts beyond fifty percent of normal demands, emergency actions will be taken in accordance with the MCWD's Emergency Response Plan, including enacting emergency ordinances as may be required by MCWD Board of Directors.

The chronic system threat to MCWD's present water supplies is seawater intrusion, which has occurred along the coastal margin of the Salinas Valley in response to historic over-drafting of the basin. Contamination from volatile organic compounds (VOCs) has also affected MCWD wells and could pose additional problems. Although seawater intrusion has not yet affected the deep zone (400-Foot Aquifer) of the SVGB (which is the source of supply for Marina's Well No.10, No.11, and No.12), it is possible that continued extractions in the 400-Foot Aquifer could ultimately lead to contamination of these water supplies by seawater. MCWD monitors the rate of seawater intrusion and plans to construct a new well in the deep aquifer and develop alternative water resources that would be insulated from intrusion. However, it is possible for intrusion to appear in a relatively short time span and reduce overall supplies available. Consequently, the MCWD has structured this Water Shortage Contingency Plan with the primary goal of reducing water supply demands to allow time for alternative water supply measures, including the drilling of alternate wells in areas unaffected by intrusion and/or contamination. A specific triggering mechanism for various levels of conservation is tied to concentrations of chlorides in MCWD wells and possible concentrations of VOCs, such as trichloroethylene (TCE) which was previously observed at low levels in Well No. 9 in Central Marina and is occasionally detected at Well No. 29 in the Ord Community. Chloride concentration is directly related to the seawater intrusion problem, and both parameters (chloride and VOCs) are related to the overall basin viability as a secure source of water supply.

Chloride concentration, which is the trigger for the most advanced stages of conservation, is also a key indicator of water quality degradation due to seawater intrusion. Tests for statistically significant changes in chloride concentrations assist in the detection of the earliest stages of intrusion and are appropriate indicators of a water supply emergency. In addition, MCWD currently monitors its Ord Community wells for the presence of TCE and other organic compounds, and works with the U.S. Army regarding the Army's groundwater cleanup actions in the Ord Community.

TRIGGERING MECHANISMS FOR CONSERVATION STAGES

These Triggering mechanisms shall be interpreted as guidelines and are summarized in Table 2. The General Manager and/or Board of Directors may impose any of the following conservation

stages based upon facts and circumstances which may not have been otherwise anticipated in this plan.

Table 2 Conservation Level Triggering Mechanisms

Conservation Stage and Shortage Level	Triggering Mechanism
Stage One 0-10% Voluntary	1) system malfunction resulting in up to 10% shortage 2) increase in chlorides which do not threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending
Stage Two >10-25% Voluntary	1) system malfunction resulting in greater than10% shortage 2) increase in chlorides which may threaten to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending
Stage Three >25-35% Mandatory	1) system malfunction resulting in greater than 25% shortage 2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced by up to 25%
Stage Four >35-50% Mandatory	1) system malfunction resulting in greater than 35% shortage 2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced more than 35%
Stage Five >50% Mandatory	1) system malfunction resulting in greater than 50% shortage 2) increase in chlorides which are expected to exceed drinking water quality standard 3) increase in VOC concentrations which do not threaten to exceed standards with blending or when remaining capacity is reduced more than 50%

STAGE 1: Up to 10% - Voluntary

Stage 1 conservation measures may be called for as a result of malfunction of all or portions of the water system that reduces supplies by up to 10% on a daily, peak seasonal or annual basis. It also may be called due to prolonged drought conditions and a need to focus public attention on water conservation.

Further triggering could also be based on:

1) detection of a statistically significant increase in chloride concentrations but where such concentrations do not threaten to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of a statistically significant increase in VOC concentrations but where such concentrations do not threaten to exceed the primary drinking water maximum contaminant level (MCL) for each VOC at the well(s) in question and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards.

STAGE 2: >10% to 25% -Voluntary

Stage 2 conservation measures may be called for due to malfunction or failure of all or portions of the water system that reduces supplies by greater than 10% on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of a statistically significant increase in chloride concentrations where such concentrations may threaten to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of a statistically significant increase in VOC concentrations, but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC at the well(s) in question and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards.

STAGE 3: >25% to 35% - Mandatory

Stage 3 conservation measures may be called for due to malfunction or failure of all or portions of the water system that reduces supplies by greater than 25% on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of an increase in chloride concentrations where such concentrations are expected to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of VOC concentrations, but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC, and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards, and/or when gross reduced well production of up to 25% is necessary to maintain adequate water quality.

STAGE 4: >35% to 50% - Mandatory

Stage 4 conservation measures may be called for due to malfunction or failure of all or portions

of the water system that reduces supplies by greater than 35% on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of an increase in chloride concentrations where such concentrations are expected to exceed the CA DHS "Upper Level" secondary (aesthetics) drinking water standard currently set at 500 mg/l at the well(s) in question, or

2) detection of VOC concentrations, but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC, and/or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards, and/or gross reduced well production of up to 35% is necessary to maintain adequate water quality.

STAGE 5: >50% - Mandatory

Stage 5 conservation measures may be called for due to in malfunction or failure of all or portions of the water system that reduces supplies by 50 % or more on a daily, peak seasonal or annual basis.

Further triggering could also be based on:

1) detection of an increase in chloride concentrations where such concentrations are expected to exceed the short term primary drinking water standard of 600 mg/l at the well(s) in question, or

2) detection of VOC concentrations but where such concentrations do not threaten to exceed the primary drinking water MCL for each VOC, and /or blending of this supply with other well supplies cannot maintain a distribution system concentration(s) below these standards, and/or gross reduced well production of over 50% is necessary to maintain adequate water quality.

4.0 CONSERVATION REQUIREMENTS AND APPEAL PROCEDURES

The following are MCWD's conservation requirements by customer type and stage and the appeal procedures. These requirements and procedures are adopted as part of MCWD's Water Shortage Contingency Plan.

STAGE 1: Up to 10% - Voluntary – Minimal Conservation Requirement

MCWD shall:

- notify all customers of the water shortage
- mail information to every customer and reasonably available potential water user explaining the importance of significant water use reductions
- provide technical information to customers on ways to improve water use efficiency
- conduct media campaign to remind consumers of the need to save water
- publicize the showerhead, toilet rebate and other efficiency programs
- enforce mandatory restrictions on water waste as provided in MCWD Code, Chapter 3

STAGE 2: >10% to 25% -Voluntary – Moderate Conservation Requirement

In addition to the actions listed in Stage 1, MCWD shall call for voluntary reductions of up to 25% for each connection based on the average use during a base period proposed by the Water Conservation Commission and adopted by MCWD's Board of Directors.

STAGE 3: >25% to 35% - Mandatory – Severe Conservation Requirement

In addition to the actions listed in Stage 1 and 2, MCWD shall establish mandatory annual allotments for each connection based on the average use during a base period proposed by the Water Conservation Commission and adopted by MCWD's Board of Directors. When Stage 3 use reduction becomes necessary, administration and enforcement of water conservation rules becomes the major focus of MCWD. If necessary, additional temporary personnel may be hired and special meetings of the Water Conservation Commission and /or Board of Directors may be scheduled.

1. Each water service connection shall receive an allotted quantity of water, typically specified in hundred cubic feet (hcf) units per billing cycle, as calculated by the Water Conservation Coordinator.

2. The Board of Directors may pass an emergency ordinance increasing the usage rate for potable water in order to ensure stable revenues for operation and maintenance of MCWD.

3. As individual customers are notified of allotments, it is expected that many requests for special consideration will be received. These petitions must be processed rapidly, efficiently and fairly. Every application for waiver must be heard, evaluated and acted upon by the Water Conservation Commission as rapidly as possible. Every action by the Water Conservation Commission shall be referred to MCWD's Board of Directors for consideration. The procedures for appeal are defined, below.

4. No building permits will be issued or meters installed for new accounts that had not received building permits before the "Severe Shortage" was declared.

5. The following water use restrictions shall be imposed.

Stage	Type Use	Restriction
3	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering using sprinkler or irrigation systems is permitted only two days per week. Addresses ending in even numbers (0,2,4,6,8) may water on Mondays and Thursdays. Addresses ending in odd numbers (1,3,5,7,9) may water on Tuesdays and Fridays. If there is no street address, or if more than one street address is associated with a contiguous property, the irrigation days are Wednesday and Saturday. (2) Manual landscape watering with a soaker hose, handheld hose or watering can/bucket is allowed on any day.
3	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering is permitted to maintain adequate growth on newly installed landscapes, for a period generally up to five (5) weeks. Property owners must notify the District of the address where new landscape is installed and the date of installation. (2) Following the initial establishment period, landscape watering using a sprinkler or irrigation system is permitted only on the days associated with the current conservation stage in effect.
3	Golf Courses, Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (2) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). (3) Course operators shall implement a ten (10) percent reduction in irrigation water use.
3	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must offer and clearly notify guests of a "limited linen/towel exchange" program.

Stage	Type Use	Restriction
3	Swimming pools, hot tubs	Initially filling new and existing swimming pools prohibited. Draining and refilling existing swimming pools permitted only if repairing a pool leak or repairing, maintaining or replacing a pool component that has become hazardous. All pools and tubs shall be covered when not in use to reduce evaporation.
3	Industrial and Commercial	Reduction of water use by any means is encouraged. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
3	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned landscape watering days during landscape watering hours (before 10:00 a.m. or after 5:00 p.m.). Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.
3	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.

STAGE 4: >35% to 50% - Mandatory – Critical Conservation Requirement

In addition to the actions listed in the previous stages, MCWD shall establish allotments based upon a 35% -50% curtailment of water use. All new and previous appeals for waiver shall be evaluated by field audit and shall be reheard by the Water Conservation Commission, if necessary, upon recommendation of MCWD staff. Water rates may be increased by the Board of Directors.

The following water use restrictions shall be imposed.

Stage	Type Use	Restriction
4	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering using sprinkler or irrigation systems is permitted only one day per week. Addresses ending in numbers 0 or 1 may water on Mondays. Addresses ending in numbers 2 or 3 may water on Tuesdays. Addresses ending in numbers 4 or 5 may water on Wednesdays. Addresses ending in numbers 6 or 7 may water on Thursdays. Addresses ending in numbers 8 or 9 may water on Fridays. If there is no street address, or if more than one street address is associated with a contiguous property, the irrigation day is Wednesday. Manual landscape watering with a soaker hose, handheld hose or

Stage	Type Use	Restriction
		watering can/bucket is allowed on any day.
4	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. The installation of new landscapes irrigated with potable water is discouraged. Landscape watering with potable water shall be subject to the following limits: (1) Landscape watering is permitted three (3) days a week to maintain adequate growth on newly installed landscapes, for a period generally up to five (5) weeks. Watering days for new landscapes are Tuesday, Thursday and Saturday. Property owners must notify the District of the address where new landscape is installed and the date of installation. Following the initial establishment period, landscape watering using a sprinkler or irrigation system is permitted only on the days associated with the current conservation stage in effect.
4	Golf Courses / Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (1) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (2) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). Course operators shall implement a twenty (20) percent reduction in irrigation water use.
4	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must limit linen/towel changes to once every two (2) nights or for the entire stay, whichever is shorter, except for health and safety.
4	Swimming pools, hot tubs	Initially filling new and existing swimming pools prohibited. Draining and refilling existing swimming pools permitted only if repairing a pool leak or repairing, maintaining or replacing a pool component that has become hazardous. All pools and tubs shall be covered when not in use to reduce evaporation.
4	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment (e.g., washing vehicle at a residence) is permitted only on assigned landscape watering days during landscape watering hours (before 10:00 a.m. or after 5:00 p.m.). Fleet managers are encouraged to only wash those vehicles as is necessary for health and safety.

Stage	Type Use	Restriction
4	Industrial and commercial	Reduction of water use by any means is encouraged. The Board of Directors may establish mandatory use reduction targets, if needed. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
4	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible.

STAGE 5: >50% - Mandatory – Emergency Conservation Requirement

Appropriate 50% water shortage allotments shall be calculated and noticed to customers. Appropriate administration and enforcement of this stringent program shall be the highest priority of MCWD activity. All resources of MCWD will be directed toward improvement and increase of water supply to the system. Water rates may be further increased by the Board of Directors.

The following water use restrictions shall be imposed:

Stage	Type Use	Restriction
5	Landscape Irrigation for Existing Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water is prohibited.
5	Landscape Irrigation for New Landscapes, including Public Parks	Landscape watering with recycled water may continue without restriction. The installation of new landscapes irrigated with potable water is prohibited during Conservation Stage 5. New landscapes installed prior to declaration of Conservation Stage 5 may water two (2) days a week to maintain adequate growth on newly installed landscapes, for the remainder of the initial five (5) week establishment period. Watering days for new landscapes are Tuesday and Friday. Property owners must notify the District of the address where new landscape is installed and the date of installation

Stage	Type Use	Restriction
5	Golf Courses / Athletic Fields	Landscape watering with recycled water may continue without restriction. Landscape watering with potable water shall be subject to the following limits: (3) All landscape out-of-play areas such as may be found around a clubhouse or entryway shall follow the general landscape irrigation restrictions. (4) All in-play areas may be irrigated during the standard watering hours (before 10:00 a.m. or after 5:00 p.m.). Course operators shall implement a thirty (30) percent reduction in irrigation water use.
5	Hotels, motels and bed and breakfasts	Hotels, motels and B&B's must limit linen/towel changes to once every three (3) nights or for the entire stay, whichever is shorter, except for health and safety.
5	Swimming pools, hot tubs	Filling new swimming pools and/or draining and refilling existing swimming pools is prohibited. All pools and tubs shall be covered when not in use to reduce evaporation. Contact District conservation staff if an existing swimming pool must be repaired and refilled during Conservation Stage 5.
5	Vehicle and Equipment Washing	Non-commercial washing of vehicles and mobile equipment is prohibited. Only commercial facilities with water recycling systems may be used.
5	Industrial and commercial	Reduction of water use by any means is encouraged. The Board of Directors may establish mandatory use reduction targets, if needed. Compliance with mandatory demand reduction measures is required for outdoor water uses including landscape irrigation, swimming pools, and vehicle washing.
5	Heavy Construction	The use of potable water for dust control shall be reduced to the greatest extent possible. The District may establish mandatory construction water budgets, if needed.

Appeals Procedure

1. Any person who wishes to appeal a customer classification or allotment shall do so in writing by using the forms provided by MCWD.

2. Appeals will be reviewed by the Water Conservation Coordinator and staff. Site visits may be scheduled if required.

3. A condition of granting an appeal shall be that all plumbing fixtures or irrigation systems be

replaced or modified for maximum water conservation.

4. Examples of appeals that may be considered are as follows:

a. Substantial medical requirements.

b. Commercial/Industrial/Institutional accounts where any additional water supply reductions will result in unemployment or inappropriate hardship, after confirmation by the MCWD staff that the account has instituted all applicable water efficiency improvements.

5. In the event an appeal is requested for irrigation of trees or vegetation, MCWD staff may use the services of a qualified consultant in determining the validity of the request. Costs for such consulting services shall be paid by the party or parties making the request.

6. The Water Conservation Coordinator shall refer all appeals to the Water Conservation Commission. The Water Conservation Commission may refer appeals to MCWD's Board of Directors.

7. If the Water Conservation Commission and the applicant are unable to reach accord, then the appeal shall be heard by the MCWD Board of Directors, who will make the final determination.

8. All appeals shall be reported monthly to the Board as a part of the Water Supply Report.

5.0 MANDATORY PROHIBITIONS ON WATER USE

California Water Code Section 10632(d). Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. Section 10632(e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

The MCWD adopted a "Water Waste/Water Conservation" Ordinance (Ordinance No. 20) in April of 1990, which prohibits water waste and promotes water conservation. Since the initial adoption, revisions were adopted by the Board of Directors on April 14, 1992 and October 4, 1993. The ordinance has most recently been revised on and now appears as Chapter 3.36 of MCWD Code. Section 3.36.030, Mandatory Restrictions on Water Waste, details the applicable prohibitions of use. These prohibitions are in force at all times. Additional water use reduction methods available to water users or MCWD to adopt in order to comply with use reductions during the more restrictive stages of water shortages (Stages 4 and 5) include, but are not limited to, the following:

a) elimination of turf irrigation with potable supplies;

b) restriction of landscape watering to shrubs and trees by hand or drip irrigation only;

c) elimination of vehicle washing except in car washes that have water recirculation systems;

d) prohibition on filling or topping off of swimming pools where damage to pumping equipment will not result;

e) elimination of water served in food service establishments unless requested;

f) elimination of the issuance of construction meters;

g) shut-off of dedicated landscape irrigation meters; and

h) moratorium on provision of new supply meters.

If water use reductions called for in Stages 3-5 are not achieved, the MCWD may amend this Water Shortage Contingency Plan to make any of the above available conservation tactics mandatory.

6.0 PENALTIES OR CHARGES FOR EXCESSIVE USE

California Water Code Section* 10632(f) *Penalties* or *charges for excessive use.

Section 3.36.050 of MCWD Code provides for a system of violations and notices. Violation of provisions of this Water Shortage Contingency Plan shall be enforced under Section 3.36.050 of MCWD Code.

7.0 REVENUE AND EXPENDITURE IMPACTS

California Water Code Section 10632(g) – An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

Enforcement of the Water Shortage Contingency Plan is assumed to be covered by enhanced revenues from application of excess use charges and penalties. MCWD reserves may be used temporarily should revenues remain below expectations. MCWD's rate structure is based upon adopted rate ranges and allows for modification of rates on short notice within those ranges. MCWD retains the ability to modify rates to meet all legitimate MCWD needs. Revenue impacts from water sales losses are estimated as follows, based upon Tier 2 rates of $2.35/hcf in Central Marina and $2.86/hcf in the Ord Community, and recognizing approximately 10% of MCWD's customers are not metered as of 2010.

Table 3: Potential Revenue Impacts of Implementation of WSCP

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Assumed Reduction	10 percent	20 percent	30 percent	40 percent	50 percent
Water Sales Loss	$ 454,664	$ 909,329	$1,363,993	$ 1,818,658	$ 2,273,322
Revenue Source: Pumping savings at $135/af	$ 53,569	$ 107,138	$ 160,707	$ 214,276	$ 267,845
Net Revenue Reduction	$ 401,095	$ 802,191	$1,203,286	$ 1,604,382	$ 2,005,477
Percent of Total Annual Water System Revenue	5%	11%	16%	21%	27%

* Table based on FY2009-2010 water sales, $7,501,854 for 3,970 acre-feet

8.0 WATER SHORTAGE CONTINGENCY PLAN IMPLEMENTATION

California Water Code Section 10632* (h) *A draft water shortage contingency resolution or ordinance.

MCWD Board of Directors adopt the Water Shortage Contingency Plan in Resolution No. 2005-31, which enables implementation of the Plan upon advice of staff based in part on the triggering mechanisms discussed herein. The resolution is attached as Appendix A to this Plan.

9.0 WATER USE MONITORING PROCEDURES

California Water Code Section 10632* (i) *A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency plan.

Normal Monitoring Procedure:

In normal water supply conditions, production figures are recorded daily by MCWD O&M personnel. Totals are reported monthly to the Water Conservation Coordinator and Water Quality Manager. Production figures are reported in the Annual Report to the Drinking Water Program, which is submitted to the California Department of Health Services each year.

Stage 1 and 2 Water Shortages

During a Stage 1 or 2 water shortage, daily production figures will be reported to the O&M Superintendent and Water Conservation Coordinator. The Water Conservation Coordinator compares the weekly production to the target weekly production to verify that the reduction goal is being met. Monthly reports are forwarded to the General Manager, the Water Conservation Commission and the MCWD Board of Directors. If reduction goals are not met, the General Manager may notify the Board of Directors so that corrective action can be taken.

Stage 3 and 4 Water Shortages

During a Stage 3 or 4 water shortage, the procedure listed above will be followed, with the

addition of a daily production report to the General Manager and weekly reports to the Water Conservation Commission and Board of Directors. Special meetings may be called for administration of the Water Shortage Contingency Plan.

Stage 5 Water Shortage

During a Stage 5 shortage, production figures will be reported to the O&M Superintendent hourly, and to the General Manager and the Water Conservation Coordinator daily. Reports will also be provided to MCWD's Board of Directors, the Monterey County Office of Emergency Services, and land use jurisdictions located within MCWD's service territory.

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Appendix H: Urban Water Management Plan Checklist

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Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
CONTINGENCY [b]				
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5.5.2 and Appendix G
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5.1
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5.5.1 and Appendix G
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Appendix G
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Appendix G
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5.5.3 and Appendix G
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5.5.4 and Appendix G
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Appendix G
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 5.5.5 and Appendix G
DMMs				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 6.3 and Appendix F
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 6.3
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 6.3 and Appendix F

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Section 6.3.10 - wholesaler DMM does not apply to MCWD
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the biannual reports are deemed compliant with Items 28 and 29.	Appendix F
EXTERNAL COORDINATION AND OUTREACH				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1.3 and Appendix C (data) Appendix D (notices)
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Appendix D
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Appendix A
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Appendix D - transmittal letter will be added
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1.2 and Appendix D
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Sections 1.2, 1.4 and Appendix D
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Appendix A
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 1.5

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Appendix D - transmittal letter will be added
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Appendix D - MCWD web page will be added
RECYCLED WATER				
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Sections 4.4.1 and 4.6
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 4.6
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 4.6
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		N/A - none currently used
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 4.6
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Sections 4.4 and 4.6
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 4.6, last paragraph
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 4.6
RELIABILITY				

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 5.1
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Sections 4.2.4, 4.2.5 and 5.2
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5.1
SERVICE AREA				
8	Describe the water supplier service area.	10631(a)		Section 2.1
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Sections 2.2 and 2.4
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in “Baseline Daily Per Capita Water Use”. See Section M.	Section 2.3 and Appendix E
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.3 and Appendix E
12	Describe other demographic factors affecting the supplier’s water management planning.	10631(a)		Section 2.4
WATER CONSERVATION				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 3.4
2	Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions.	10608.36		Section 3.5
3	Report progress in meeting urban water use targets using the standardized form.	10608.4		N/A - initial year

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
WATER DEMANDS				
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Sections 3.1, 3.2, 3.3 and Appendix C
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 3.3.1
WATER SUPPLY				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Sections 4.2, 4.4, 4.5, 4.6
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Sections 4.4, 4.5, 4.6
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, brackish water, groundwater, and other.	Section 4.1, 4.2
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Section 4.2.2
16	Describe the groundwater basin.	10631(b)(2)		Section 4.2.1
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Section 4.2.2
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		Section 4.2.2
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		Section 4.2.1, last paragraph, Section 4.2.2 and Section 4.2.6

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 4.1
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 4.4
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4.3
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4.4
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Sections 4.4.1, 4.4.2 and 4.5
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	N/A - District is neither a wholesale supplier not a wholesale customer
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Sections 4.2.4, 4.2.5, 4.2.6 and 4.5

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.
b The Subject classification is provided for clarification only. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review for completeness.

Appendix I: Comments Received on the Draft Plan