

MARINA COAST WATER DISTRICT
2015 URBAN WATER MANAGEMENT PLAN



Prepared by

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

June 2016

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4. North Marina Area Groundwater Data and Conditions, Hopkins Groundwater Consultants, Inc., May 2016
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Table i. Acronyms Used in this Report

Acronym	Description
afy, ac-ft/yr	Acre-feet/year
ccf, hcf	Hundred cubic feet
gpd	Gallons per day
gpcd	Gallons per capita day, or gallons per person per day
mgd	Million gallons per day
BMP	Best management practice
CASGEM	California Statewide Groundwater Elevation Monitoring
CAW, CalAm	California American Water Company
CDPH	California Department of Public Health
CPUC	California Public Utilities Commission
CSUMB	California State University óMonterey Bay
DMM	Demand management measure
DWR	California Department of Water Resources
FORA	Fort Ord Reuse Authority
GSA	Groundwater Sustainability Agency
LAFCO	Local Agency Formation Commission
MCWD, District	Marina Coast Water District
MCWRA	Monterey County Water Resources Agency
MPWMD	Monterey Peninsula Water Management District
MRWPCA	Monterey Regional Water Pollution Control Agency
OMC	Ord Military Community
POM	Presidio of Monterey
PWM GWR	Pure Water Monterey Groundwater Replenishment Project
SB	California Senate Bill
SGMA	Sustainable Groundwater Management Act
SRDP	Salinas River Diversion Project
SVWP	Salinas Valley Water Project
SVGB	Salinas Valley Groundwater Basin
UCMBEST	University of California Monterey Bay Education, Science and Technology Center
UWMP	Urban Water Management Plan

Table ii. Units of Measure Used in this Report

Unit	Equals
1 acre-foot	= 43,560 cubic feet = 325,851 gallons
1 cubic foot	= 7.48 gallons
1 CCF	= 100 cubic feet = 748 gallons
1 MGD	= 1,000,000 gallons/day = 1,120 acre-feet / year

Section 1 - Plan Preparation

1.1 Background

The California Water Code, Division 6, Part 2.6, Section 10610 et. seq. (California Urban Water Management Planning Act) requires any municipal water supplier serving over 3,000 connections or 3,000 acre-feet of water per year (afy) to prepare an urban water management plan.

In adopting the Urban Water Management Planning Act, the state declared as policy that:

- a) The management of urban water demand and efficient use of water shall be actively pursued to protect both the people of the state and their water resources;
- b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions;
- c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

Through the Urban Water Management Planning Act, the state recognizes that water is a limited, though renewable, resource and that a long-term reliable supply of water is essential to protect the economy. It also recognizes that, while conservation and efficient use of water is a statewide concern, planning for this use is best done at the local level. Therefore each supplier is required to submit its plan to the State Department of Water Resources.

In preparing this 2015 Urban Water Management Plan (UWMP), the Marina Coast Water District (MCWD) reviewed its 2005 and 2010 UWMPs, schedule of water conservation best management practices actions and other supply development actions. Redevelopment of the former Fort Ord, greatly delayed by the economic downturn at the time the 2010 UWMP was published, is resuming at a brisk pace. The ongoing multi-year drought of record and associated conservation measures continue to impact supply and demand. These developments are reflected in the updated demand projection tables in this report.

1.2 Public Participation in Plan Development

MCWD has encouraged public participation in the development of this Urban Water Management Plan. A public advisory group, which helps shape the plan, was formed in May 2016. The group consists of representatives from the community, taxpayers, and other stakeholders. On May 23, 2016 the group met at the Marina Coast Water District office and at local libraries. A public hearing was held for the plan on June 6, 2016 as noted in the Board resolution reproduced in Appendix A.

1.3 Agency Coordination

The Urban Water Management Planning Act modified under SB 1518, effective January 1, 2003, requires MCWD to notify affected land use jurisdictions of plan development and provide an opportunity to review the draft plan. Requests to participate in development of the plan, and copies of the draft plan were sent to each affected land use jurisdiction, the United States Army, which hold u " i t q w p f y c v g t " t k i j v u " y k v j " O E n d t h e M o n t e r e y C o u n t y W a t e r R e s o u r c e s A g e n c y (M C W R A) . A n o t i c e o f h e a r i n g f o r t h e d r a f t U W M P w a s p u b l i c l y p u b l i s h e d a n d s e n t t o a l l p u b l i c a g e n c i e s M C W D s e r v e s i n c l u d i n g t h e c i t i e s o f M a r i n a , M o n t e r e y , S e a s i d e , a n d D e l R e y O a k s , t h e U . S . A r m y , t h e U n i v e r s i t y o f C a l i f o r n i a M o n t e r e y B a y E d u c a t i o n a l , S c i e n c e a n d T e c h n o l o g y C e n t e r (U C M B E S T) , C a l i f o r n i a S t a t e U n i v e r s i t y o f M o n t e r e y B a y (C S U M B) , C a l i f o r n i a S t a t e P a r k s M o n t e r e y D i s t r i c t a n d M o n t e r e y C o u n t y (s e e T a b l e 1 . 1) . A d d i t i o n a l l y , M C W D n o t i f i e d t h e F o r t O r d R e u s e A u t h o r i t y (F O R A) t h e M o n t e r e y R e g i o n a l W a t e r P o l l u t i o n C o n t r o l A g e n c y (M R W P C A) a n d t h e M o n t e r e y P e n i n s u l a W a t e r M a n a g e m e n t D i s t r i c t (M P W M D) q h " v j g " r n c p ø u " f g x g C o p i e s o f t h e s e n o t i c e s a n d c o p i e s o f t h e d r a f t p l a n n o t i c e s a r e i n A p p e n d i x D .

MCWD will provide each of the public agencies listed above and the California State Library with a copy of the final plan. A final copy of the plan and appendices will be posted on the MCWD website: www.mcwd.org.

Table 1.1 Coordination with Appropriate Agencies

Coordinating Agencies	Was sent the initial projections	Provided feedback on initial projections	Was sent a notice of intention to adopt	Was sent a copy of the draft plan	Commented on the draft plan	Attended public hearing	Not involved/ No information
U.S. Army	X		X	X			
City of Marina	X		X	X			
City of Seaside	X		X	X			
City of Del Rey Oaks	X		X	X			
City of Monterey	X	X	X	X			
County of Monterey (RDH)	X		X	X			
CSUMB	X		X	X	X		
UCMBEST	X	X	X	X	X		
State Parks	X		X	X			
FORA	X	X	X	X			
CalAm			X	X			
MCWRA			X	X			
MRWPCA			X	X			
MPWMD			X	X			
General Public						X	

1.4 Plan Adoption

The 2015 Urban Water Management Plan was adopted by the Marina Coast Water District Board of Directors on June 6, 2016. A copy of the resolution approving the plan is included in Appendix A.

1.5 Plan Implementation

The District has adopted policies and procedures that facilitate implementation of the plan, with many of the actions already in progress:

- ◁ The District Code of Ordinances includes mandatory prohibitions on water waste, water shortage contingency actions, and enforcement provisions.
- ◁ MCWD prepares Water Supply Assessments and Written Verifications of Supply for proposed projects and provides them to the land use jurisdiction.
- ◁ MCWD reviews project plans compared to water allocations made by the land use jurisdiction. MCWD contacts the affected jurisdiction to resolve the discrepancy before allowing the connections in question.
- ◁ MCWD monitors new developments to ensure the average water demand does not exceed the water allocation made by the land use jurisdiction, and works with project owners and the affected jurisdiction when water uses habitually exceeds the allocation.
- ◁ New water supply projects as reflected in this plan are in the approved Capital Improvements Program. MCWD has entered into formal agreements with Monterey Regional Water Pollution Control Agency to implement the Pure Water Monterey Groundwater Replenishment Project (urban recycled water), as discussed in Section 4.
- ◁ MCWD has a full-time water conservation staff that provides customer assistance and manages the rebate programs discussed in Section 6.
- ◁ MCWD will be required to implement the Sustainable Groundwater Management Act discussed in Section 4.

Section 2 - System Description

2.1 District Location, History and Operations

The Marina Coast Water District is located on the coast of the Monterey Bay at the northwest end of the Salinas Valley (Figure 2.1). The District was formed in 1960 to provide potable water service to all residential, commercial, industrial, environmental, and fire protection uses in the unincorporated community of Marina. The original boundary was coincident with the Marina Fire District. In 1970, MCWD constructed a wastewater treatment plant and installed a wastewater collection system to serve the community. The City of Marina incorporated in 1975, but MCWD remained separate. In 1991, MCWD constructed a pilot recycled water system, providing tertiary treated wastewater for irrigation of public streetscapes and parks near the wastewater plant. This system operated only until 1992, when the wastewater collection system was connected to the regional wastewater system operated by the Monterey Regional Water Pollution Control Agency. The Marina wastewater treatment plant was retired, and MCWD now provides wastewater collection services only, with treatment performed at the regional plant. In 1996, MCWD constructed a seawater desalination facility to explore the feasibility of extracting seawater through shallow wells along the beach.

2.1.1 Central Marina Service Area

MCWD's jurisdictional boundary¹ and Central Marina service area encompasses 3.2 square miles, and its sphere of influence encompasses an additional 2.4 square miles (see Figure 2.2). In 1996, MCWD entered into the Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands among MCWD, Monterey County Water Resources Agency (MCWRA), J.G. Armstrong family and RMC Lonestar (now CEMEX), to annex into Monterey County Zones of Benefit 2 and 2A. Under that agreement, MCWD may pump up to 3,020 AFY of Salinas Valley Groundwater for delivery to the Central Marina service area.

The agreement recognized the Armstrong property¹ for irrigation but limited the property to 20 afy of potable water. The Armstrong property could withdraw an additional 150 afy of potable water when the property was annexed to Zones 2/2A and an additional 150 afy every two years thereafter, up to a total of 920 afy for potable purposes. Armstrong would be required to pay annexation fees to MCWRA in order to annex to Zones 2/2A. The Armstrong Ranch annexation to Zones 2/2A will be effective when LAFCO approves concurrent annexation to MCWD and the City of Marina.

The agreement limited the CEMEX property to its historic pumping rate of 500 afy of non-potable water. The CEMEX property could be annexed to MCWD upon payment of annexation fees to MCWRA. If CEMEX wanted to receive potable water, then CEMEX would be required

¹ Boundaries per the Local Area Formation Commission (LAFCO) of Monterey County

to pay an additional annexation fee to MCWRA. The CEMEX annexation to Zones 2/2A will take effect when the CEMEX property is annexed to MCWD.

If and when these properties are annexed into MCWD, the District would have the right to pump and deliver those quantities of water to customers within those areas.

2.1.2 Ord Community Service Area

The District also provides potable water delivery and wastewater conveyance services within the boundaries of the former Fort Ord Army Base, known as the Ord Community. The Ord Community lies to the southeast of the City of Marina and the District service area (see Figure 2.2). The Ord Community encompasses a 44 square mile area, of which about 20 square miles is designated for redevelopment, with the balance being parks and open space.

In 1991 the former Army base was downsized and realigned pursuant to the Defense Base Closure and Realignment Act of 1990, with closure in 1994. Portions of the base were retained for use by the U.S. Army under the control of the Presidio of Monterey (Presidio Annex), with the balance being converted to civilian use under the guidance of the Fort Ord Reuse Authority (FORA), a public agency created for this purpose by the State of California. FORA membership includes the land use jurisdictions encompassed by the former Fort Ord lands and others on the Monterey Peninsula. FORA is governed by a 13-member board with representatives from the following jurisdictions:

- § City of Carmel
- § City of Del Rey Oaks
- § City of Marina
- § City of Monterey
- § City of Pacific Grove
- § City of Salinas
- § City of Sand City
- § City of Seaside
- § County of Monterey

The Base Reuse Plan also included provisions for three institutions of higher learning:

- ◁ California State University, Monterey Bay (CSUMB)
- ◁ University of California, Monterey Bay Environmental Science and Technology Center (UCMBEST)
- ◁ Monterey Peninsula College

MCWD is an ex officio member of FORA.

FORA has the statutory authority to provide for public capital facilities, including but not limited to, water and wastewater facilities and capacity allocations on the former Fort Ord in support of the Base Reuse Plan. However, FORA has a limited statutory life and needed a reliable, long-term entity to provide public services to the area.² In May 1997, the FORA Board approved the preparation of a Public Benefit Conveyance (PBC) application to the federal government for transfer of the water distribution and wastewater collection systems to MCWD. In June 1997, the U.S. Army and MCWD signed a caretaker agreement authorizing MCWD to operate the water and wastewater collection systems. In February 1998, MCWD and FORA executed an agreement for water and wastewater facilities, providing for the ownership and operation of water and wastewater facilities acquired from the federal government for the benefit of the Ord Community service area. Title for these systems and the associated water and wastewater rights were transferred from the U.S. Army through FORA to MCWD in 2001, and the systems were subsequently interconnected. In 2007, MCWD combined the water system permits for the Central Marina and Ord Community service areas into a single California Department of Public Health Permit, No. 2710017.

Under the 1993 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, MCWRA allocated 6,600 afy of potable groundwater to the Army for use on Fort Ord. This amount is about equal to the peak historic water use on Fort Ord. Of this, MCWRA requires that not more than 5,200 afy may be pumped from the 180-Foot and 400-Foot aquifers, to reduce the risk of seawater intrusion. When the U.S. Army conveyed the water and wastewater rights and infrastructure on the former Fort Ord through FORA to MCWD, the Army retained a portion of the groundwater pumping rights and wastewater treatment capacity for the Presidio of Monterey Annex (also called the Ord Military Community). The U.S. Army contracted directly with MCWD to provide municipal water supply and wastewater collection services within the Ord Military Community³.

The Marina Coast Water District Board does not allocate water supply to projects, but instead advises customer land use jurisdictions as to the current and historic water use within their boundaries and the estimated remaining supply available for new developments. Within the Ord Community, the FORA Board has managed the allocation of Salinas Valley groundwater

² Pursuant to Government Code 67700, FORA will sunset on June 30, 2020. The water and wastewater facilities and rights were deeded from FORA to MCWD in 2001, so no change in ownership of those facilities and rights will occur when FORA sunsets.

³ Potable Water Utility Service for the Presidio of Monterey Annex, Contract DABT6798C-1001, dated 5/12/00, and Wastewater Collection Utility Service for the Presidio of Monterey Annex, Contract DABT6798C-1002, dated 5/12/00.

supplies among the seven land use jurisdictions, and they, in turn, sub-allocate water supply to specific projects. Water allocations are discussed in a technical memorandum in Appendix F.

Service to the Ord Community outside the Presidio of Monterey Annex is provided under the 1998 agreement with FORA. In 2006, the Local Agency Formation Commission (LAFCO) of Monterey County published the Municipal Services Review of the Monterey Peninsula Area, and stated that MCWD may pursue annexation of the Ord Community. At some indeterminate date, MCWD may consider applying to LAFCO formal annexation of all or portions of the former Fort Ord into the District. No formal decision has yet been made by the MCWD Board.

Figure 2.1 MCWD Vicinity Map

Marina Coast Water District Vicinity Map



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Legend


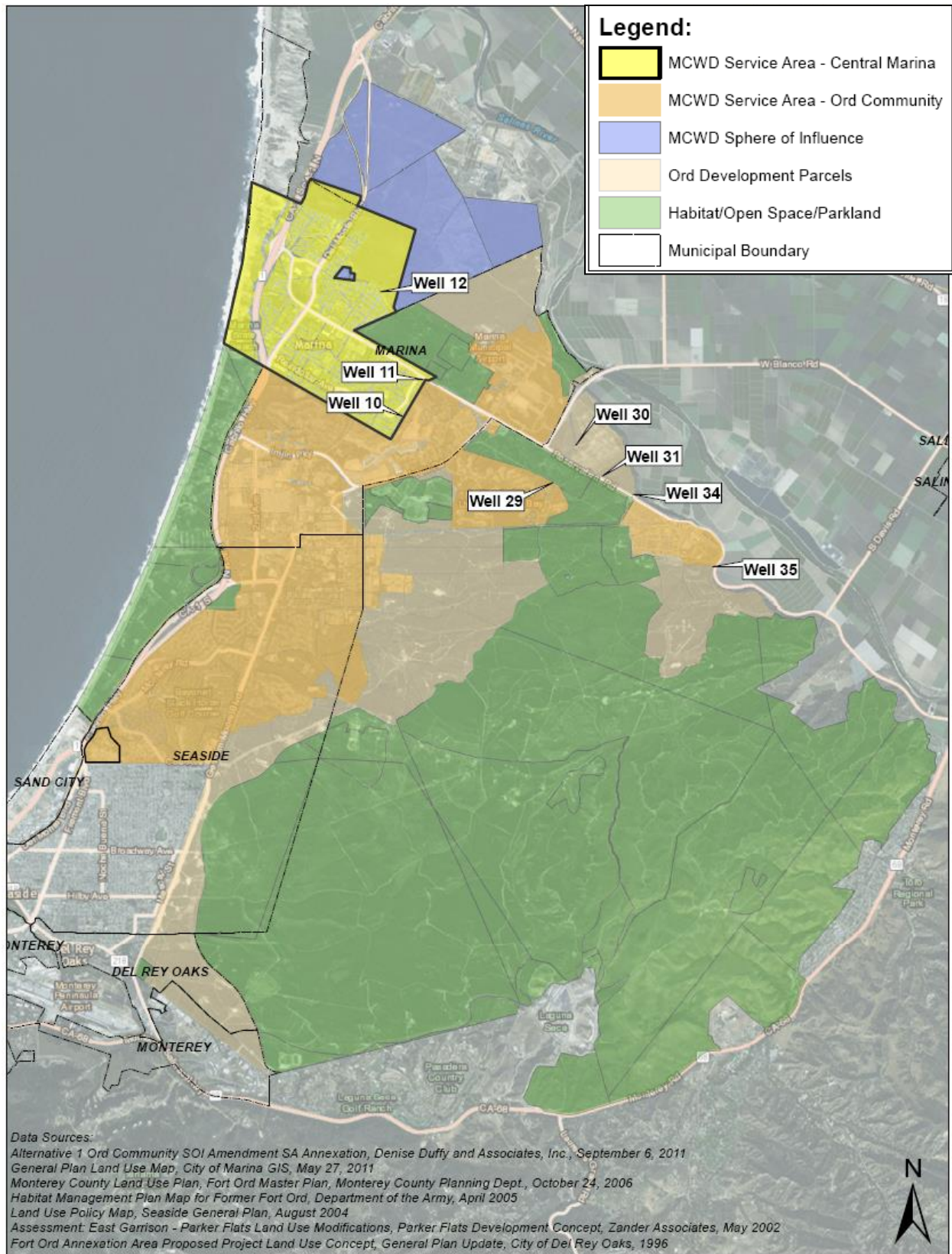
 MCWD SERVICE AREA

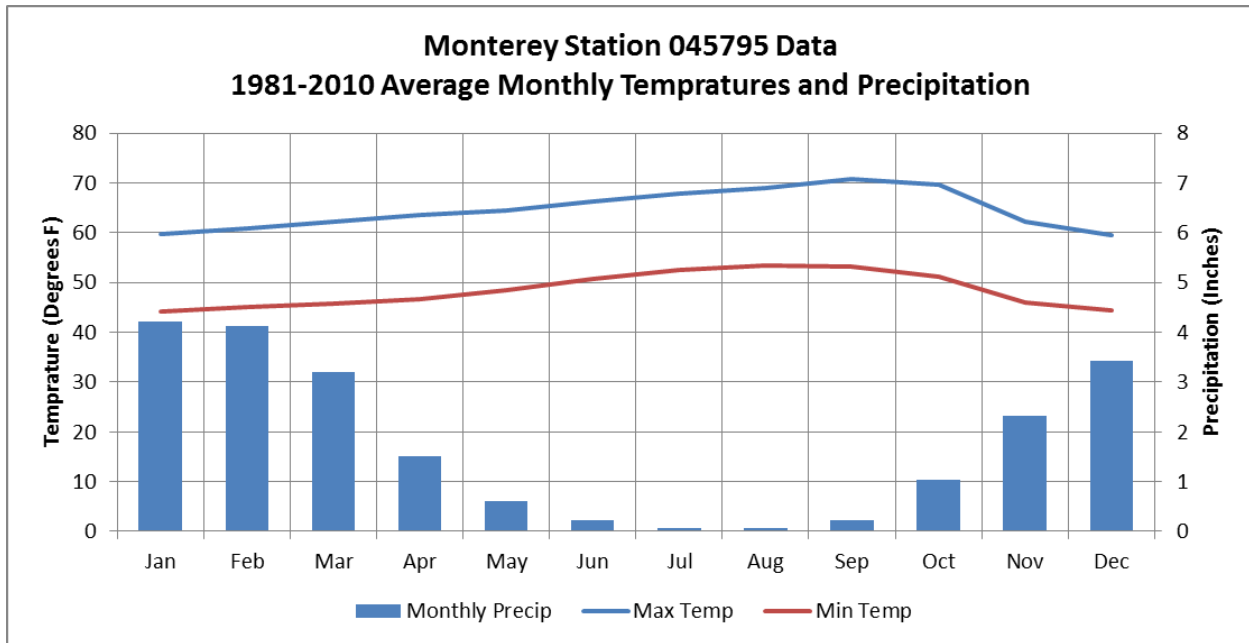
Figure 2.2 MCWD Service Areas



2.2 Climate

Marina has a cool summer-type Mediterranean climate with precipitation falling exclusively as rain, predominantly between October and May. The nearest official weather station is seven miles away in Monterey, California. Average climate data from this station from 1981-2010 is depicted in Figure 2.3.

Figure 2.3 Local Climate Averages



The moderating effect of the Pacific Ocean and its relatively cold water allows for mild summertime temperatures in Marina. This effect suppresses summertime irrigation demands for landscaping as compared to inland locations, especially when advection fog moves in from the Pacific Ocean, enveloping the immediate coast in response to heating inland. Unlike inland locations, summertime temperatures generally peak in September rather than July.

Peak summertime temperatures usually occur when high pressure is resident in the Great Basin (Santa Ana conditions), allowing for an offshore flow and compressional heating of the atmosphere.

Precipitation averages about 20 inches annually. Table 2.1 depicts monthly average evapotranspiration (ET_o) at the nearest California Irrigation Management Information System (CIMIS) stations. Note that the ET_o rate increases the more distant from the coast.

Table 2.1 Local Evapotranspiration Rates (inches)

City	CIMIS Station ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual ETo
Castroville	19	1.6	2.0	3.1	4.2	4.8	4.8	4.1	3.6	3.2	2.7	1.8	1.5	37.2
Salinas North	116	1.6	1.9	3.1	4.1	4.7	4.9	4.5	4.2	3.5	2.8	1.8	1.5	38.6
Pacific Grove	193	1.6	2.0	3.1	4.2	4.8	4.8	4.1	3.6	3.2	2.7	1.8	1.5	37.2
Laguna Seca	229	1.6	2.0	3.1	4.2	4.8	4.8	4.1	3.6	3.2	2.7	1.8	1.5	37.2

2.2.1 Current Statewide Drought

Since 2013, the state has been experiencing below-average rainfall, with 2013 being the driest year on record. Governor Brown declared a drought state of emergency in January 2014, and the State Water Resources Control Board (SWRCB) implemented a series of emergency regulations mandating water conservation measures and urban water use reporting. The District called for voluntary water conservation in January 2014, and implemented Stage 3 mandatory water use restrictions in November 2014. The Stage 3 restrictions included mandatory reductions in landscape watering, which significantly reduced water use. MCWD was assigned a water conservation goal of 12% compared to year 2013 water use (4,431 AF). The District achieved significant savings, reducing demand by 10% in 2014 (4,026 AF) and 27% in 2015 (3,228 AF).

2.3 Population

MCWD historically served only the City of Marina, which incorporated in 1975. In 1997, the District began providing service to the Ord Community under agreement with FORA. Table 2.2 depicts MCWD population between 1970 and 2010, population increases for Marina were quite steady. From 1970 to 1980 the population nearly tripled. Growth rates moderated in the 1980s, with the population reaching a near-term peak in 1990. With the closure of Fort Ord as a military base in 1994, the City and MCWD experienced a decline in population (the on-base population was estimated at 31,000 in 1990). A longer discussion of historic population can be found in Appendix E.

Table 2.2 Historic Population

Service Area	1960	1970	1980	1990	2000	2010
City of Marina*	3,310	8,343	20,647	26,436	18,927	19,718
Ord Community**					14,886	10,762
Total	3,310	8,343	20,647	26,436	33,813	30,480

Source: U.S. Census Bureau

*City of Marina totals include the portion of the city within the Ord Community

**Ord Community totals excludes the City of Marina portion. Ord population shown only for period served by MCWD.

With redevelopment of the Fort Ord lands, population growth is expected to return, with population projections shown in Table 2.3. These projections include redevelopment of the Ord Community, including portions of the cities of Seaside, Del Rey Oaks, and Monterey, campuses for the University of California and California State University, and lands remaining under the jurisdiction of the County of Monterey within the boundaries of the former Fort Ord.

Table 2.3 Projected Population

Service Area	2010*	2015	2020	2025	2030	2035
Central Marina	13,646	17,703	18,770	24,504	25,620	26,736
Ord Community	16,834	14,672	21,694	32,144	39,015	43,425
Total	30,480	32,375	40,464	56,648	64,635	70,161

* 2010 population aggregated by service area.

The above projections are based upon the existing population plus the anticipated occupancy of new residential development, as projected in Section 3. A more detailed discussion of the methodology can be found in Appendices C and E. The projected totals for 2035 are approximately equal to the 2030 projection in the 2010 Urban Water Management Plan (about 70,000 persons). The projection in the 2010 UWMP assumed that a recent housing project in the Ord Military Community would provide additional homes, but instead the housing authority moved personnel from older housing stock into the new units as part of a phased upgrade plan. Additionally, some of the projected redevelopment has been deferred beyond the 20-year planning horizon of this report due to the economic recession from December 2007 to June 2009.

2.4 Demographic Factors

Three industries have historically driven the local economy: agriculture in the Salinas Valley, tourism along the Pacific Coast and the Monterey Peninsula, and the military with bases at Fort Ord, the Presidio of Monterey and the Naval Postgraduate School. The closure of Fort Ord in 1994 greatly reduced the military contribution, but that has been replaced by higher education on the former Fort Ord. California State University óMonterey Bay is the largest campus within the Ord Community, which also contains the smaller campuses of Monterey College of Law and Monterey Peninsula College. The University of California Monterey Bay Education, Science and Technology Center is located at the Marina Municipal Airport.

Tourism and recreation are significant portions of MCWD ø u " e w t t g p v " c p f " h w v w t g Central Marina currently has hotels and visitor-serving commercial sectors, as well as Marina State Beach. The Ord Community has Fort Ord Dunes State Park and approximately 24 square miles of open space managed by the Bureau of Land Management. D N O ø u " t g i k q p c n " q now located in Marina. The existing Bayonet and Blackhorse Golf Courses are being developed by the City of Seaside into a resort community. The City of Del Rey Oaks plans to add a golf resort to their portion of the Ord Community.

Within the District, residential use (95% of customer accounts, 85% of total water sales). This high percentage results in a low per capita water demand. Residents have historically worked on the former Fort Ord, as well in the nearby urban centers of Monterey, Salinas and the more distant San Jose/Silicon Valley; or in the agricultural industry of rural Monterey County. Employment on the former Fort Ord has not yet recovered to pre-closure levels.

As Central Marina and the Ord Community are redeveloped, a mix of commercial, office and light industrial uses are proposed, which will increase the average per capita water demand rate. Industries with high water-use are anticipated to be constrained due to the limited water supply available to the jurisdictions.

Section 3 - Water Demands

3.1 Current Water Use

Marina Coast Water District has two separate service areas: Central Marina, which encompasses the portion of the City of Marina outside the former Fort Ord, and the Ord Community. All water service connections in the Central Marina area are metered. Fort Ord did not have individual service meters while it was an active military base, and portions of the housing areas within the Ord Community remain without meters. Water meters continue to be installed in areas of the Ord Community in phases by the various property owners. Water use by customer type for calendar year 2010 is shown in Table 3.1, and year 2015 is shown in Table 3.2. The water use in the Ord Community without meters was estimated at 0.33 acre-feet/year per residential connection in 2010, and reduced to 0.28 acre-feet/year per residential connection in 2015.

Table 3.1 Water Deliveries in 2010

Water use sectors	Central Marina		Ord Community		Ord Non-metered		Total
	# Cust.	Ac-Ft	# Cust.	Ac-Ft	# Cust.	Ac-Ft	Ac-Ft
Single family	3,305	829.8	1,011	200.8	601	210.0	1,240.6
Multi-family	251	505.0	1,385	592.4	600	200.0	1,297.4
Commercial	234	232.5	70	95.4			327.9
Industrial	0	0.0	3	6.7			6.7
Institutional/governmental	25	67.9	136	214.6			282.6
Landscape	72	107.9	105	705.6			813.5
Agriculture	0	NA	0	NA			0.0
Other	0	NA	0	NA			0.0
Total	3,887	1,743.2	2,710	1,815.5	1,201.0	410.0	3,968.7

Table 3.2 Water Deliveries in 2015

Water Use Sectors	Central Marina		Ord Community		Ord Non-metered		Total
	# Cust.	Ac-Ft	# Cust.	Ac-Ft	# Cust.	Ac-Ft	Ac-Ft
Single family	3280	741.0	1334	227.1			968.1
Multi-family	261	399.2	1636	505.6	735	205.8	1110.6
Commercial	232	231.7	75	95.3			327.0
Industrial	0	0.0	2	0.2			0.2
Institutional/governmental	25	41.7	136	114.2			155.9
Landscape	18	242.9	139	389.3			632.3
Agriculture	0	NA	0	NA			0
Other	0	NA	0	NA			0
Total	3816	1656.6	3322	1331.7	735	205.8	3,194.1

MCWD began providing water for irrigation of Bayonet/Blackhorse Golf Courses in Seaside in 2010. Prior to this, the City of Seaside provided irrigation supply from wells within the Seaside Groundwater Basin, which was the source of supply for this demand at the time the former Fort Ord closed. In 2015, the City transitioned back to using Seaside Groundwater Basin wells for the golf courses, which is reflected in the reduced usage for landscape irrigation.

3.2 Projected Water Demands

3.2.1 Central Marina Service Area Demands

In October 2000, the City of Marina adopted a comprehensive General Plan laying out future land use over a 20-year planning horizon to the year 2020. The General Plan was amended in 2005 and 2006, and the housing element was updated in 2009. In the adopted General Plan the population (anticipated to expand into current spheres of influence) is projected to be 38,800 by 2020⁴. This includes increases in both Central Marina and the Central Marina Community. The economic recession from December 2007 to June 2009 delayed much of this redevelopment by five to ten years. The Marina General Plan estimates water consumption for the City will average 7,720 afy based upon the projected land uses and population. It also includes portions of the Ord Community that are either within the City limits or within its adopted and proposed spheres of influence. These areas include portions of the UCMBEST Center and CSUMB, which have specific allocations of water under the FORA Reuse Plan.

Even with the resumption of development in recent years, the per-capita water demand is low, and has been trending downward for the last ten years due to aggressive water conservation programs. Per capita demands will continue to be affected by conservation efforts, future land use changes as well as increases in density of housing use (persons/unit). Marina has had a historically low job-to-housing balance ratio due, in part, to the fact that the City has been a bedroom community to the former Fort Ord, Monterey and San Jose areas. The General Plan will allow for greater balance in jobs-to-housing. This trend will tend to increase the average per capita water consumption, as more commercial and industrial activity will occur relative to population. If housing density increases, this would have an opposite influence, suppressing per capita demand.

In the 2005 UWMP, the City of Marina forecasted planned development through 2025. These plans within the City of Marina include 276 single-family homes, 1,050 hotel rooms and 102,000 square feet of retail uses. In 2010, the City drafted a Downtown Vitalization Specific Plan, for which a water supply assessment was also drafted. Under this plan, the City projects the addition of 380,000 square-feet of commercial space and 2,400 new multi-family dwelling units, targeting a pedestrian friendly downtown. Although it has not yet been formally adopted, the draft specific plan was reflected in the 2010 UWMP and in this update.

There are two significant undeveloped areas north of Central Marina: Armstrong Ranch and the CEMEX (formerly RMC Lonestar) Property. MCWD currently serves minor domestic uses on the Armstrong Ranch, and in the future, MCWD will serve municipal and industrial demands as they may occur on these properties. Current agricultural demands are met via private wells.

⁴ This population includes an estimated 3,400 residents of the existing Fred Schuber Park, a

Marina General Plan accounts for growth within portions of the Armstrong Ranch, which was annexed into the City in 2007. The Marina Station Development Project on the Armstrong Ranch comprises 1,464 residential units and about 856,000 square feet of retail, office and light industrial space. Development density will be constrained by the available water supply as provided under the 1996 Annexation Agreement and Groundwater Mitigation Framework for Marina Area Lands, annexing the Armstrong Ranch lands to the MCWRA Zones 2 and 2A. According to that agreement, the Salinas Basin groundwater allocation for the Armstrong Ranch is 920 afy. This is further discussed in Section 4.

Similarly, the CEMEX Property, for which there are no near-term development plans, has a groundwater allocation under the annexation agreement of 500 afy, corresponding to current estimated use on the property. If CEMEX were to be developed for visitor-serving or recreation uses, it could only occur after the year 2020 pursuant to the Urban Growth Boundary Initiative. Planned development in these areas is included in the subtotals discussed in Section 3.2.4.

3.2.2 Ord Community Service Area Demands

The Fort Ord Reuse Authority developed the Draft Fort Ord Reuse Plan in 1996, and released the associated Draft Environmental Impact Report (DEIR). This plan and DEIR assessed the impacts of planned reuse on the environment, including demand for utility services. The DEIR noted that at full build out, some 40 to 60 years in the future, water demands for Ord Community lands would be 18,262 afy, or 11,662 afy in excess of current potable water supply now available to the lands under groundwater allocations from the Salinas Valley groundwater basin. Recognizing that plans did not exist to accommodate this excess demand, it was concluded in the DEIR that the Reuse Plan had a significant unavoidable environmental impact. It was also stated that the 7,000 acre-foot water use on the former Fort Ord lands (6,600 Salinas Basin, 400 Seaside Basin) provided sufficient supplies to allow for expected redevelopment through 2015.

In adopting a Final EIR, Reuse Plan and Master Resolution governing redevelopment of former Fort Ord lands to civilian uses, FORA agreed to constrain redevelopment on former Fort Ord lands by limiting the number of new residential housing units to 6,000 until the Reuse Plan is reassessed, and additional water supplies identified. FORA further recognized that the supply of Salinas Basin groundwater available to serve redevelopment, or reuse, projects is limited by a 1993 agreement with the MCWRA. Under that 1993 Agreement, 6,600 afy of Salinas Basin groundwater is available for use on Ord Community lands. Since the closure of Fort Ord, that total quantity of water has been allocated between FORA and the U.S. Army, with FORA sub-allocating its share of this Salinas Basin groundwater supply to its member land-use jurisdictions to support redevelopment projects within the Ord Community. FORA manages its groundwater allocation and sub-allocations through a Development and Resource Management Plan that annually tracks water use.

One of the mitigation measures in the Final EIR, Reuse Plan and Master is the development of 2,400 afy of additional water supply for the Ord Community, which will allow development beyond the initial 6,000 dwelling units. FORA is working with MCWD to develop this supply under the Regional Urban Water Augmentation Project, which is discussed in Section 4.4.1.

In 2015, as part of this UWMP update, MCWD surveyed land use jurisdictions responsible for development decisions within the Ord Community Service area for their development plans through the year 2035. Where used in this plan, individual responses from the Cities of Marina, Seaside, Del Rey Oaks and Monterey, the County of Monterey, CSUMB, UCMBEST, and the U.S. Army are detailed in Appendix C. These responses were correlated with the City of Marina General Plan Housing Element, City of Seaside General Plan Housing Element, the City of U g c u Implementation Plan, 2007-2012, Seaside-Fort Ord Redevelopment Project Area, and the Monterey County General Plan.

3.2.3 Demand Projection Methodology

The primary method for developing future water demands in this Plan is through consolidating information from approved Specific Plans and the associated Water Supply Assessments, when available. Water supply assessments have been prepared per the requirements of SB 610 for the developments listed in Table 3.3. These documents contain detailed estimates of water demand for residential, commercial and irrigation use type, and are used as the basis of water supply allocation by the land use jurisdiction to the projects.

Table 3.3 Water Supply Assessments Used to Update the UWMP⁵

Development	Jurisdiction	Year Prepared
Cypress Knolls	Marina	2006
Dunes on Monterey Bay (University Villages)	Marina	2007
Marina Heights	Marina	2003
Marina Station	Marina	2006
Resort at Del Rey Oaks	Del Rey Oaks	2007
Seaside Main Gate	Seaside	2007
East Garrison	Monterey County	2004
Monterey Downs	Seaside/County	2012

Within the last five years, only one water supply assessment was completed. The Monterey Downs Project includes a residential development, the Monterey Horse Park and the California Central Coast Veterans Cemetery. The project is located in both the City of Seaside and unincorporated Monterey County, and would be annexed into the City of Seaside. In the 2010 UWMP, the Horse Park portion of the project was included in the Monterey County growth

⁵ The WSAs did not conclude that there was existing water supply available for every project. Shortfalls were identified in the WSAs for Cypress Knolls and Monterey Downs.

projection, but has been moved under the City of Seaside for this update. Also in the last five years, the Whispering Oaks Business Park Specific Plan was adopted by Monterey County in 2011, but later rescinded in 2012. That project was included in the 2010 UWMP, but has been removed from this update.

Where water supply assessments do not exist, land-use development forecasts were used. California State University Monterey Bay and the U.S. Army ó Ord Military Community projections are from their approved master plans. The projections provided by the other land use jurisdictions for areas outside specific plan areas reflect planning estimates based on the approved General Plans. The anticipated additional land uses in various categories were tabulated by year, and demands were calculated by applying water use factors for those uses. These factors (see Table 3.4) are general in nature and ultimate actual use can vary significantly, especially among the broad categories of commercial and industrial uses.

Table 3.4 Water Demand Factors Applied in the UWMP

Land Use	Units	Multiplier
SF Residential (< 5 units / acre)	dwelling unit	0.5
SF Residential (5-8 units / acre)	dwelling unit	0.33
Residential (8-15 units / acre)	dwelling unit	0.25
Multifamily (> 15 units / acre)	dwelling unit	0.25
Hotel, Motel and Timeshares	unit	0.17
Retail	square-feet	0.00021
Restaurant*	square-feet	0.00145
Office / R&D	square-feet	0.000135
Other Commercial	square-feet	0.0003
Light Industrial	square-feet	0.00015
Governmental	square-feet	0.0003
Institutional	square-feet	0.0003
Schools (K-12)*	square-feet	0.0003
Higher Education*	square-feet	0.0003
Landscape (non-turf)	acre	2.1
Landscape (turf)	acre	2.5

* typical per seat factor converted to square-feet

Some of the above usage factors were compared to actual usage for year 2015:

- < Hotel/motel: 0.11 AFY/room (interior demand)
- < Multifamily Residential (Apartments): 0.12 AFY/DU (interior only)
- < Multifamily Residential (Duplex/Fourplex): 0.24 AFY/DU

Note that mandatory drought restrictions were in place that year, and overall water use was 25% below average. Detailed customer data from 2012 was not available to evaluate usage in an average weather year. The differences are significant enough to merit reevaluating the hotel/motel and apartment demand factors using data from a non-drought year. Single-family housing areas were also evaluated, but due to the mix of housing types and landscapes within a given subdivision (the smallest level of aggregated data), typical usage factors could not be determined.

On-campus uses specific to CSUMB were evaluated as well, using ten years of meter data compiled by the campus facilities staff. The following demand factors are recommended for use in evaluating the next campus master plan update, which is currently being drafted:

- < Dormitory: 0.031 AFY/bed
- < Academic Building: 0.00002 AFY/sq-ft
- < Dining Hall: 0.00016 AFY/sq-ft
- < Gymnasium: 0.00005 AFY/sq-ft

MCWD modified its District Code in August 2005 to require additional conservation measures in the construction of new development and remodeling. These new requirements include incorporation of hot water recirculation systems and high efficiency clothes washers for residential units, and zero-use urinals for non-residential construction. These residential requirements are expected to achieve the State water conservation goal of an average indoor per capita consumption rate of 55 gallons per person per day.

It has been observed that during the development process and in the preparation of water supply assessments and written verifications of supply, more sophisticated forecasts are made by disaggregating indoor and outdoor uses when the proposed land use data is sufficient to support such analyses. These assessments generally result in lower projected water demands than the general methods used in this Plan. In a long-term forecast such as provided here, the precise types of uses and plot plans that will be constructed and maintained over the long term cannot be precisely known. As development proceeds, market forces will dictate the specific land uses within non-residential zones and refined plans for residential uses will allow for more detailed consumption projections. The Urban Water Management Planning Act recognizes this fundamental nature of demand forecasting in requiring updated Urban Water Management Plans every five years. In the case of MCWD, where development in the next twenty years is expected to dramatically change the nature of the community and more than double its population and water demands, these periodic updates will be critical to O E Y F ø u " c d k n k v { " v q " r n demands as they are identified.

3.2.4 Summary of Demand Projections

The projected 20-year water demands in this Urban Water Management Plan are roughly equal to the 20-year projection in the 2010 UWMP (both approximately 12,200 acre-feet/year). This lack of increase is due to a number of factors.

First and foremost, the economic downturn that began in 2007 severely slowed the pace of redevelopment in the Ord Community. Five residential developments were under construction in 2007: East Garrison in Monterey County, Dunes on Monterey Bay and Marina Heights in Marina, Seaside Resort in Seaside and Doe Park (formerly Stilwell) Housing in the Ord Military Community. Of these, only Doe Park was completed. Two affordable housing (apartment) projects within East Garrison and the Dunes on Monterey Bay were completed in 2014. East Garrison resumed construction in 2013, and has completed 70 market-rate units. The Dunes on Monterey Bay did not add market rate units until 2015. The other developments are not expected to resume construction until 2016 at the earliest. Similarly, most of the other development within the Ord Community has been delayed. Full reuse of the former Fort Ord may not occur until 2035 or later, versus the previous prediction of full reuse before 2020. Deferred projects include the golf resort near the Marina Airport, the Seaside east housing developments, and 2 million square-feet of projected office/research and development space within UCMBEST.

The second factor responsible for the lower water demand projection is the erroneous assumption in the 2010 UWMP that the Doe Park development would provide additional dwelling units within the Ord Community. As stated earlier in this report, that project provided replacement housing units for the Ord Military Community, and residents were moved from older housing stock into the new development.

The third factor contributing to reduced water demand is that housing within CSUMB and portions of the Ord Military Community are now metered, and data shows that actual water use declines with the installation of meters and transition to commodity-rate billing. The 2010 UWMP assumed that unmetered units used 0.33 AFY/dwelling unit. In this update, that factor has been revised down to 0.28 AFY/dwelling unit. The District is working with the Ord Military Community to install meters on the remaining occupied units. Additionally, several housing areas including Preston Park, CSUMB East Campus Housing and the older portions of the Ord Military Community have undergone water conservation retrofits within the last five years, replacing toilets with high-efficiency 1.28 gallon/flush units, shower heads with 2.0 gpm heads, and faucets with 1.5 gpm aerators.

Table 3.5 depicts the total expected growth in demands from all currently expected development and population growth through 2035. Due to the current drought restrictions, demand values reflect the actual year 2012 demands (typical year for rainfall) plus the actual/projected

development within each jurisdiction. Included for comparison are the existing allocations of groundwater supply by jurisdiction, which are explained in Section 4.

It should be noted that in 2010, the District began providing Salinas Valley groundwater for golf course and landscape irrigation at Seaside Resort (Bayonet and Blackhorse Golf Courses). This demand had been previously met with Seaside basin groundwater, from existing wells owned by the City of Seaside. In 2015, the City resumed operation of their Seaside Groundwater Basin wells. As discussed in Section 4, the District plans to supply recycled water for urban landscape of Salinas Valley groundwater allowed the City of Seaside to reduce their pumping from the Seaside Groundwater Basin, as part of the Seaside Groundwater Management Plan.

As discussed in Section 2.1.2, the 6,600 AFY of existing groundwater pumping rights for the Ord Community have been allocated among the land use jurisdictions. Table 3.5 shows that the current groundwater allocation for Central Marina is sufficient to meet projected demands through 2035. The City of Marina is projected to exceed its current Salinas Valley groundwater allocation by the year 2045, and will require the development of additional water supply for that service area by 2040. The Ord Community is projected to exceed its current Salinas Valley groundwater allocation by the year 2025. This is discussed in detail in Section 4, Water Supply.

Table 3.5 Water Demand by Jurisdiction (afy)

	Jurisdiction	2012*	2015**	2020	2025	2030	2035	Notes	Allocation
Ord	U.S. Army	620	633	663	825	825	825		1,577
	CSUMB	404	404	442	632	755	779		1,035
	Del Rey Oaks	0	0	186	551	551	551		243
	City of Monterey	0	0	0	130	130	130		65
	County of Monterey	8	52	377	539	539	539		720
	UCMBEST	3	3	94	299	515	515	3	230
	City of Seaside	657	657	997	1,852	2,447	2,876	1	1,012
	State Parks and Rec.	0	0	12	18	20	25		45
	Marina Ord Comm.	264	285	901	1,572	1,702	1,704	2	1,625
Assumed Line Loss	395	348	348	348	348	348		348	
Marina	Armstrong Ranch	0	0	0	680	680	680		920
	Cemex	0	0	0	0	0	500		500
	Marina Central	1,823	1,823	2,184	2,491	2,606	2,725		3,020
	Subtotal - Ord	2,351	2,382	4,021	6,766	7,833	8,293	4	6,900
	Subtotal - Marina	1,823	1,823	2,184	3,171	3,286	3,905		4,440
	Total	4,174	4,204	6,205	9,937	11,119	12,197		11,340

*Actual demands from calendar year 2012 used to represent a non-drought year.

** Projected 2015 demands. Actual use was lower due to mandatory drought restrictions

1 Seaside includes Seaside Resort Golf Course (250 AFY temp use).

2. Allocation includes 1325 AFY groundwater and 300 AFY existing pilot desalination plant

3. MBEST commented that they may develop up to 230 AFY as soon as the market allows it.

4. Allocation includes 6600 AFY groundwater and 300 AFY existing pilot desalination plant.

3.3 Projected Water Demand by Sector

Table 3.6 shows the projected water consumption by use sector in the period 2015-2035.

Table 3.6 Water Demand by Sector (afy)

Water use sectors	Existing*	2015	2020	2025	2030	2035
Single family	1,037	1,101	1,717	2,728	3,128	3,432
Multi-family	1,378	1,391	1,658	2,351	2,734	2,971
Commercial	289	289	1,220	2,339	2,616	2,645
Industrial	3	3	24	214	250	750
Institutional/Governmental	231	231	276	501	503	508
Landscape	753	755	875	1,337	1,420	1,423
Agriculture	0	0	0	0	0	0
Other (provision for loss)	482	435	435	467	467	467
Total	4,174	4,204	6,205	9,937	11,119	12,197

* Actual demands for 2012

Note: Provision for loss includes both Central Marina and the Ord Community

3.3.1 Lower Income Housing Demands

The Water Code requires water suppliers to document water demand projections for lower income single family and multi-family housing within their UWMPs. Lower income is defined in Section 50079.5 of the Health and Safety Code as less than 50% of the area median household income.

The housing elements of the general and specific plans for the land use jurisdictions served by MCWD all include Affordable Housing requirements. Affordable Housing, as required in the California Redevelopment Law and specified within Monterey County, includes four income levels: very low, low, moderate and workforce. Only the first two levels, very low income and low income, must be reported separately in the UWMP. The following discussion explains how the current and projected lower income housing water demands were estimated.

The City of Marina has a significant amount of existing affordable housing. Within the Central Marina Service Area, the City has 258 low and very low income multi-family units, and 2 single-family ownership units. Within the Ord Community, the City has 650 affordable housing units, of which 517 are low and very low income. All of the existing units are multi-family duplex, four-plex or apartments. The City requires new residential development of twenty or more units to include a minimum of 20% affordable housing. Within that 20%, 6% must be very low income, 8% must be low income and 6% must be moderate income. Based on approved specific plans, lower income projections for the City include 102 town homes and 23 single family homes in Marina Station, 116 apartments in Cypress Knolls, 53 duplexes in the Dunes on Monterey Bay, and 205 apartments within Marina Station. Of the 200 proposed dwelling units within the TAMC Transit Oriented Design development, 14% or 28 units are assumed to be lower income.

Infill development is projected for Central Marina, but it is unknown if any projects will exceed the 20 dwelling threshold requiring an affordable component.

The City of Seaside currently has 51 affordable multi-family units in the Ord Community, of which 41 are designated for lower income households. Within the current housing projection, the City will require 25 affordable single family units in Seaside Resort to be affordable, and 72 affordable units elsewhere in the Ord Community. Of this, 68 units, or 67%, are assumed to be lower income. Within the Monterey Downs Specific Plan there are 256 affordable apartment units planned, with 128 assumed to be for lower income.

Monterey County requires 20% of all residential development or redevelopment to be affordable housing. Within that 20%, 6% must be very low income, 8% must be low income and 6% must be moderate income. Workforce housing requirements are then assigned on a project by project basis. Within the East Garrison Development, 196 low and very low income housing units are identified in the project specific plan, greatly exceeding the minimum requirement.

UCMBEST is expected to develop 330 multi-family and 200 single family units within the Ord Community, in unincorporated areas within the Marina Sphere of Influence. For these projects, we have assumed that 14% of the units will be restricted for lower incomes, as required by both the County and City.

The City of Del Rey Oaks has not yet developed its portion of the Ord Community. In the Environmental Impact Report for the Resort at Del Rey Oaks, 138 affordable apartment units (multi-family) are identified. We estimate 97 of those units will be lower income, based on the Monterey County ratio of 70% of affordable being low or very low income.

Two institutional entities within the Ord Community, CSUMB and the U.S. Army, provide housing within the Ord Community for their students and employees. Because the assignment of this housing is governed by different rules than the California Redevelopment Law, we have assumed it to be workforce housing (and not low income) for the purpose of this report.

For projects with an approved Water Supply Assessment (WSA), the projected water demands were based upon the demand rates for the applicable type of housing unit in the WSA. For existing housing units and all other projected development, demands were estimated using the multi-family residential demand factor of 0.25 acre-feet per year. The time-phasing of lower income housing was assumed to match that of the larger development. The results are shown in Table 3.7.

Table 3.7 Lower Income Housing Demands (afy)

	Jurisdiction	Existing*	2015	2020	2025	2030	2035
Ord	U.S. Army		0	0	0	0	0
	CSUMB		0	0	0	0	0
	Del Rey Oaks		0	0	24	24	24
	City of Monterey		0	0	0	0	0
	County of Monterey		6	17	36	36	36
	UCMBEST		0	3	14	26	26
	City of Seaside	10	10	28	48	107	168
	State Parks and Rec.		0	0	0	0	0
	Marina Ord Comm.	129	129	290	452	596	736
Marina	Armstrong Ranch		0	0	55	55	55
	Cemex		0	0	0	0	0
	Marina Central	65	65	85	105	119	133

Subtotal - Ord	151	157	350	601	833	1,034
Subtotal - Marina	65	65	85	160	174	188
Total	216	222	435	761	1,007	1,221

*Existing (2012) demands estimated at 0.25 AFY/EDU

3.4 Water Conservation Baseline and Targets

The Water Conservation Act of 2009 (SB X7-7) requires each retail urban water supplier to establish baseline daily per capita water demand and water conservation targets, as outlined in Enchil 20x2020 Water Conservation Plan. The plan establishes a statewide goal of reducing average per capita water demand by twenty percent by the year 2020. The State estimated the average statewide demand for 2005 at 192 gallons per capita day (gpcd), with a statewide conservation target of 154 gpcd in 2020. An interim statewide target of 173 gpcd (ten percent reduction) by the year 2015 was also established. In the 20x2020 Plan, regional baselines and targets were also established.

The Marina Coast Water District is in the Central Coast Hydrologic Region. The regional baseline water demand was estimated to be 154 gpcd, the lowest in the state. The regional conservation targets are 139 gpcd by the year 2015, and 123 gpcd by the year 2020.

The Department of Water Resources (DWR) published detailed methodologies as to how baselines and targets are to be calculated. Baseline per capita water demands are calculated as a ten-year average water consumption rate for a period ending not earlier than December 31, 2004 and not later than December 31, 2010. This is calculated as gross annual water demand divided by average annual population. Water suppliers may choose any consecutive ten-year period within the allowable window, corresponding to calendar years, fiscal years or other standard reporting intervals. Once established, the baseline demand must be used for compliance reporting in 2015 and 2020, and the same reporting year (calendar, fiscal, etc.) must be used. If

the system-wide average water demand is 100 gpcd or less, the water supplier is not required to achieve additional conservation savings.

Historic water demand for MCWD is shown in Table 3.8. Annual population values were estimated using estimates from the California Department of Finance, as detailed in Appendix E. As can be seen, MCWD's average water demand has decreased from 123 gpcd in 2009 to 100 gpcd in 2015. The 10-year averages ending in 2004 and 2005 were not considered in selecting a baseline period, due to the large population changes in the mid-1990s when Fort Ord closed. Of the remaining periods, MCWD selected the period ending December 31, 2008, for calculating the baseline water demand, which is 135.3 gpcd. This period includes years with and without construction activity in the Ord Community, and is considered a more representative median than the lower value in later years.

Per Section 10608.20 of the Water Code, there are four methodologies available for calculating compliance targets, as listed below. A more detailed discussion of the methods and analysis are included at Appendix E.

- Method 1: 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 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 California Urban Water Conservation Council (CUWCC) Target Water Use Schedule (TWUS).
- Method 4: Estimated water savings by using conservation Best Management Practices (BMP) as prescribed by the California Urban Water Conservation Council (CUWCC). This method is similar to Method 2, but requires more detailed information on current water uses.

Table 3.8 Per Capita Water Demands

Year	Central Marina			Ord Community			System-Wide		
	Marina Pop.	Annual Water Use (MG)	Daily Per Capita (gals)	Ord Pop.	Annual Water Use (MG)	Daily Per Capita (gals)	Daily Per Capita (gals)	10-year Average (gpcd)	5-year Average (gpcd)
1995	16,685	657.6	108	5,000	913.0	500	198		
1996	16,465	690.5	115	7,796	811.4	285	170		
1997	16,586	699.6	116	10,593	838.7	217	155		
1998	17,128	606.1	97	11,119	679.7	167	125		
1999	17,331	730.4	115	11,327	780.6	189	144		
2000	17,574	749.4	117	11,563	772.7	183	143		
2001	17,715	744.6	115	11,701	726.0	170	137		
2002	17,781	751.5	116	11,867	696.2	161	134		
2003	17,805	712.1	110	11,808	698.7	162	131		
2004	17,876	737.0	113	11,757	789.5	184	141	147.8	
2005	17,672	715.1	111	11,805	649.6	151	127	140.6	
2006	17,509	582.1	91	11,645	817.5	192	132	136.8	
2007	17,493	528.6	83	11,572	958.3	227	140	135.3	134.0
2008	17,706	597.4	92	11,827	739.3	171	124	135.3	132.7
2009	17,852	639.2	98	11,891	676.5	156	121	132.9	128.7
2010	18,057	568.1	86	12,043	778.5	177	123	130.9	127.9

* Annual population values based upon CA Dept. of Finance estimates.

Water suppliers may select any of the four methods to calculate compliance water demand targets. They must also calculate the maximum allowable target, and select the lower of the two. The alternate maximum 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. The 2020 conservation target must be less than or equal to 95% of the 5-year base daily per capita usage. MCWD selected the period ending December 31, 2008, for its 5-year baseline period, as reflected in Table 3.9.

Water demands within the District are already significantly below the state and regional averages due to aggressive water conservation practices. Therefore, MCWD has elected to use Method 3, which is a goal of 5% below the regional target. As seen in Table 3.9, the maximum allowable target is greater than the Method 3 target, so the Method 3 target may be used. The interim (2015) target is the average of the 10-year baseline and the 2020 target.

Table 3.9 District Baseline and Targets

Description	Year	Amount
Baseline Water Demand	2008	135 gpcd
Maximum Target (95% of 5-year baseline)	2020	126 gpcd
Method 3 Target (95% of Regional Target)	2020	117 gpcd
Interim Target	2015	125 gpcd

V j g " F k u v t k e v ø u " c e v w AFY", and the population is estimated at 32,375 u " 5 . 4 4 persons, resulting in an average 89 gpcd. This is well below the required conservation target, and was achieved by implementing District-wide conservation practices in addition to the statewide drought restrictions on urban water use. It is anticipated that water use will increase after the drought restrictions are removed, but that the average usage rate will remain below the conservation target due to the significant number of water conservation retrofits achieved in the past three years.

3.4.1 Plan for Meeting Urban Conservation Targets

Table 3.10 shows the total projected water demands for the District, the projected population and the resulting per capita water demands. The average demand per person increases in the future due to the projected non-residential development. Population projections are based upon the projected housing developments and the associated persons per unit in the respective specific plans. Where specific plans do not exist, the average persons per unit for the City or census tract were used. Population tables are included in Appendix C.

Table 3.10 Projected Per Capita Water Demands

	2015*	2020	2025	2030	2035
Projected Demand (AFY)	4,204	6,205	9,937	11,119	12,197
Projected Recycled Water (AFY)**	0	600	1,359	1,359	1,359
Net Potable Demand (AFY)	4,204	5,605	8,578	9,760	10,838
Projected Population	32,375	40,464	56,648	64,635	70,161
Projected demand per person (gpcd)	115.9	123.7	135.2	134.8	137.9
Water Use Targets (gpcd)	125	117	117	117	117
Projected Target Exceedance (gpcd)	None	6.7	18.2	17.8	20.9

* 2015 demands adjusted to non-drought condition. Actual use was 3,228 AFY.

**Based on RUWAP Recycled Water Project Schedule

To reduce per capita demands below the compliance targets, the District has four strategies, in addition to the on-going water conservation efforts:

- ◁ First, MCWD is implementing an urban recycled water project for landscape irrigation.
- ◁ Second, the design standards for new construction exceed the U v c plumbing code requirements.
- ◁ Third, the remaining non-metered customers will be metered and have a financial incentive to reduce water use.

- ◁ Finally, the phased redevelopment of the Ord Community will include the replacement of a significant amount of water distribution system that is over 50-years old. These replacements should reduce system water losses but are not reflected in this table.

As seen in the bottom line of Table 3.10, these measures will come close to achieving the e q p u g t x c v k q p " v c t i g v u . " d w v " c f f k v k q p c n " g h h q t v " y per capita demand rate have steadily declined over the past fifteen years due to water conservation retrofits, consumer education and replacement of existing housing stock. During the period 1999-4 2 3 6 . " v j g " F k u v t k e v ø u " u g t x k e g " c t g c " r q r w overall water use declined by an average 41 acre-feet per year. The per capita usage rate declined by an average 2.0 gpcd/year over that period (see Figure 3.1 and Table 3.11). Assuming that decline continues, the District will continue to meet their demand target.

Figure 3.1 Population and Per Capita Usage

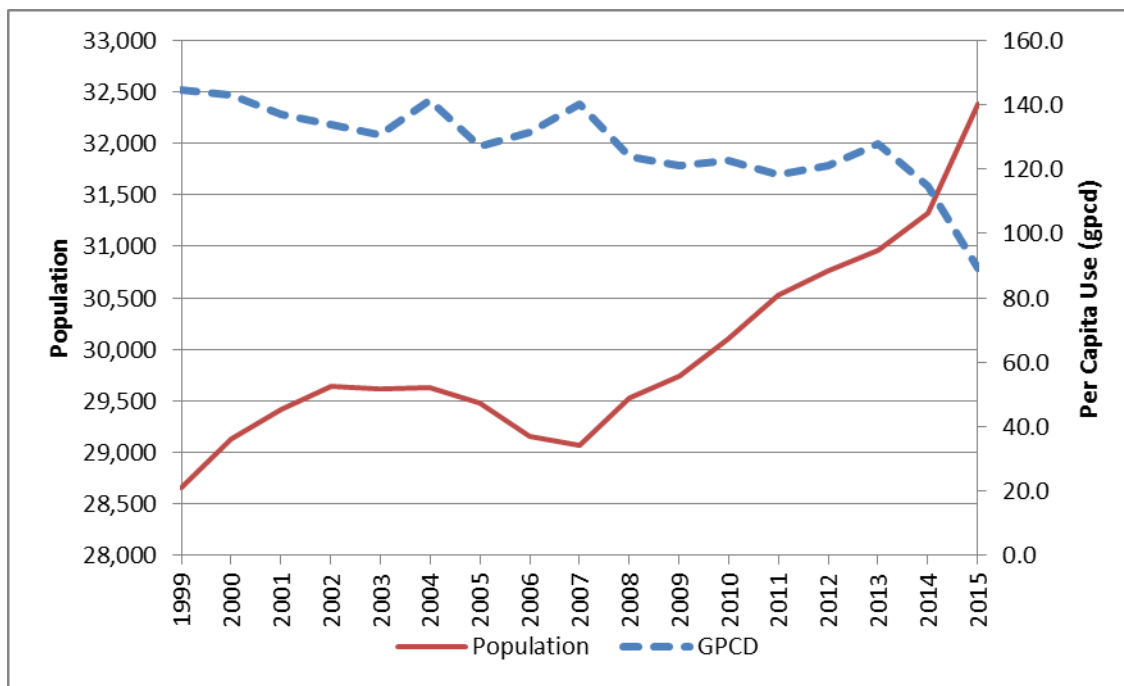


Table 3.11 Per Capita Water Demand, 2011-2015

Year	Population	Water Use (AF)	Average gpcd
2011	30,521	4,047	118.4
2012	30,767	4,174	121.1
2013	30,961	4,431	127.8
2014	31,325	4,026	114.7
2015	32,375	3,228	89.0

The use of recycled water to serve non-potable demands is a conservation measure recognized in the 20x2020 State Conservation Plan. As detailed in Section 4, MCWD included recycled water in the Regional Urban Water Augmentation Program, completed the project design and CEQA documents in 2007. On April 8, 2016, MCWD and MRWPCA entered into the Pure Water Delivery and Supply Project Agreement, wherein the District will receive up to 1,427 AFY of advanced treated recycled water from the Pure Water Monterey Project. As shown in Table 3.10, the project is expected to provide 600afy in 2020, and increase to 1,359 afy in 2025.

MCWD has adopted design guidelines and standards that exceed the state plumbing code requirements for water conserving fixtures, codified in Section 3.36 of the District Ordinances. New residential development is required to include high-efficiency toilets, hot-water recirculation systems, and when provided, clothes washers must meet high efficiency standards. Non-residential development must include waterless urinals and HET or dual-flush toilets. All landscapes over 2,500 square-feet are separately metered and must meet the requirements of the U v c model water-efficient landscape ordinance.

The final jurisdiction on Fort Ord with non-metered accounts is the Ord Military Community. The Army is removing and replacing their older housing areas by phases, and when complete, all housing units will be metered. The housing manager began working with the District to install meters in the older housing areas in 2014. Sixty-six of the existing units have been metered, but over 900 units remain. Of those, about 730 units are occupied.

Section 4 - Water Supplies

4.1 Water Sources and Water Rights

The sole source of water supply for the Marina Coast Water District is the Salinas Valley Groundwater Basin, described in detail in Section 4.2. Both Central Marina and the Ord Community Service areas have relied upon this source of supply since the areas were initially developed. The District owns and operates its production wells, and does not purchase wholesale water supply.

As discussed in Section 2, under the 1993 and 1996 Annexation Agreements for Zones 2 and 2A, MCWRA granted groundwater allocations of 6,600 AFY to the Army and 3,020 AFY to MCWD for overlying irrigation uses and allocated 20 AFY of potable water. The agreement reserved an additional 900 AFY of potable water (920 AFY total) for the Armstrong Ranch subject to annexation to Zones 2/2A and to MCWD and the City of Marina. The agreement also recognized and limited the CEMEX property to its historic use of 500 AFY of non-potable water use. Zone 2 was formed as a benefit and assessment zone to finance the construction and operation of Lake Nacimiento, and Zone 2A was formed as a benefit and assessment zone to finance the construction and operation of Lake San Antonio.

The 1996 Annexation Agreement grants the exercise of regulatory authority by the MCWRA under Water Code App. Section 52-22, and the MCWD. The purpose of the 1996 Annexation Agreement was to provide regulatory authority to the MCWRA for management protection of the groundwater resource in the Salinas Valley Groundwater Basin and to provide for the exercise of regulatory authority by the MCWRA under Water Code App. Section 52-22, and the MCWD.

Backstop: Under the 1993 and 1996 Annexation Agreements, MCWRA has "allocated groundwater pumping rights" to Fort Ord and to the Marina Area Lands. Under the Annexation Agreements, MCWRA has agreed to backstop those groundwater allocations in the event that the actual available groundwater is not physically or legally available (e.g., because of a Salinas Valley Groundwater Basin adjudication).

Section 4.g of the 1993 Annexation Agreement states:

- g. Should future litigation, regulation or other unforeseen action diminish the total water supply available to the MCWRA, the MCWRA agrees that it will consult

⁶ MCWRA Negative Declaration re: Annexation of Marina Area Lands to Zones 2/2A, dated February 21, 1996, at p. 4.

⁷ Purpose section, Attachment B1 to Initial Study for Marina Lands Annexation.

with the Fort Ord/POM Annex Commander. Also, in such an event, the MCWRA agrees to exercise its powers in a manner such that Fort Ord/POM Annex/RC shall be no more severely affected in a proportional sense than the other members of the Zone.

Section 8.1 of the 1996 Annexation Agreement states:

8.1. Equal treatment by MCWRA and MCWD. If future litigation, regulation or other unforeseen action diminishes the total water supply available to MCWRA, MCWRA agrees that it will exercise its powers so that MCWD, Armstrong and Lonestar shall be no **more** severely affected in a proportional sense than other lawful users of water from the Zones, based on the right before the imposition of any uniform and generally applicable restrictions as described in paragraph 8.2 to use at least the quantities of water from the Basin described in paragraphs 5.1., 6.9., and 7.2. MCWRA shall not at any time seek to impose greater restrictions on water use from the Basin by MCWD, Armstrong or Lonestar than are imposed on users either supplying water for use or using water within the city limits of the City of Salinas. MCWD, Armstrong and Lonestar will comply with any basin-wide or area-wide water allocation plans established by the MCWRA which include MCWD, Armstrong and Lonestar, and which do not impose on use of water on the lands described in Exhibits "B", "C", and "D" restrictions greater than are imposed on users either supplying water for use or using water within the City of Salinas, and which satisfy the requirements of paragraph 5.2 of this Agreement and Framework.

Table 4.1 provides the recent groundwater production for the Central Marina and Ord Community service areas. Note that well capacity is not included in the table. MCWD has redundant well pumping capacity to accommodate maintenance shut-downs during peak days.

Table 4.1 Groundwater Production (acre-feet)

Year	Central Marina	Ord Community	Total (ac-ft)
2006	1,786	2,509	4,295
2007	1,622	2,941	4,563
2008	1,833	2,269	4,102
2009	1,962	2,076	4,038
2010	1,744	2,389	4,133
2011	1,698	2,348	4,047
2012	1,814	2,360	4,174
2013	1,467	2,964	4,431
2014	1,619	2,407	4,026
2015	1,420	1,808	3,228

The three water production wells in the Central Marina service area and one in the Ord Community are in the Deep Aquifer, as described in Section 4.2.1. MCWD is currently the only significant user of the Deep Aquifer, although there are Deep Aquifer wells serving the

Monterey Dunes Colony (120 homes) and the Armstrong Ranch. The other four wells in the Ord Community service area are in the 400-foot Aquifer.

Additionally, MCWD has a seawater desalination plant located at its main office adjacent to Marina State Beach. This facility is not currently in use, but has a design capacity of 300 acre-feet per year. It is discussed in Section 4.4.

Energy use by the District is provided in Appendix I.

4.2 Groundwater

4.2.1 Salinas Valley Groundwater Basin

Potable water for MCWFD developed in the Salinas Valley Groundwater Basin.⁸ This groundwater basin underlies the Salinas Valley from San Ardo to the coast of Monterey Bay. Groundwater places Marina and Fort Ord in the Seaside Sub-basin (3-4.08, see Figure 4.1) of the Salinas Valley Groundwater Basin. The Bulletin 118 subbasins within the Salinas Valley Groundwater Basin (SVGB) are listed in Table 4.2.

Table 4.2 DWR Subbasins within the Salinas Valley Groundwater Basin

DWR Basin /Subbasin	DWR Designation	Area (acres)	DWR Ranking	DWR CASGEM Overall Ranking
3-4	Salinas Valley Groundwater Basin			
3-4-01	180/400 Foot Aquifer	84,400	High/Critical*	24.0
3-4-02	East Side Aquifer	57,500	High	27.0
3-4-04	Forebay Aquifer	94,100	Medium	17.3
3-4-05	Upper Valley Aquifer	98,200	Medium	15.5
3-4-06	Paso Robles (Monterey & SLO Counties)	597,000	High/Critical*	23.3
3-4-08	Seaside	25,900	Medium	20.8
3-4-09	Langley	15,400	Medium	18.8
3-4-10	Corral De Tierra	15,400	Medium	15.0

*Designated as a Critically Overdrafted Subbasin by DWR January 2016

⁸ See Figure 2.2 for well locations.

Figure 4.1 Monterey County Groundwater Basins and Sub-Basins⁹

⁹Boundaries from Figure 29, Central Coast Hydrogeologic Reconnaissance Report, Bulletin 118, Page 138

