

CHAPTER 2

Water Demand and Supplies

2.1 Introduction

This chapter describes the bases for the estimates of current and future water demand and supplies assumed in the analyses presented in this EIR. As noted in Chapter 1, Introduction, CalAm filed an application before the California Public Utilities Commission (CPUC) to construct, own, and operate the proposed CWP. In addition to the CWP, CalAm's Proponent's Environmental Assessment (PEA) for the project considers, at the direction of the CPUC's Administrative Law Judge, a regional water supply project. The Monterey Peninsula Water Management District (MPWMD) manages and regulates the use, reuse, reclamation, and conservation of Carmel River water that is stored in San Clemente and Los Padres Reservoirs and groundwater pumped from wells in Carmel Valley and the Seaside Coastal Area (MPWMD, 2008). Subsequent to the submittal of CalAm's application and PEA, the MPWMD prepared an updated estimates of water supply to be met by the CWP and Regional Project. This chapter explains the bases for the water supply needs and assumptions.

CalAm's Monterey District, serves most of the Monterey Peninsula, including the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Sand City, and Seaside, and the unincorporated areas of Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest. This part of CalAm's service area is supplied by surface water and groundwater from the Carmel River system and the coastal subarea of the Seaside Groundwater Basin (Seaside Basin). CalAm's service area boundaries generally correspond to those of the Monterey Peninsula Water Management District (MPWMD),¹ which manages surface water and groundwater resources in the Carmel Valley and groundwater in the Seaside coastal area (refer to **Figures 3-2a and 3-2b in Chapter 3, Project Description**). Besides its main distribution system (i.e., the areas served by the Carmel River and Coastal subarea of the Seaside Basin), CalAm also operates three small independent waters systems along the Highway 68 corridor east of Monterey (Ryan Ranch, Bishop, and Hidden Hills) that are within MPWMD's boundaries and draw water from the Laguna Seca subarea of the Seaside Basin.² Under the regional project alternative, the Coastal

¹ While the boundaries of the MPWMD and CalAm Monterey District generally coincide, there are a few exceptions: an area north and east of Seaside and Sand City is within the MPWMD boundaries but served by the Marina Coast Water District (MCWD), as shown in Figure 2.1. CalAm also operates three small independent waters systems in the Highway 68 corridor east of Monterey (Ambler, Chular, and Ralph Lane) that are outside MPWMD's boundaries and outside the Seaside Basin (CalAm, 2006a; CalAm, 2007). According to MPWMD, CalAm's Monterey District includes about 40 parcels that are outside the MPWMD boundaries (MPWMD, 2006).

² Although CalAm does not consider the areas outside the Carmel River system and Seaside Basin Coastal subarea to be part of its proposed CWP (CalAm, 2007), replacement supply will eventually be needed for these systems based on the adjudication of water rights within the Seaside Basin, as discussed in this chapter.

Water Project (CWP) would also provide water to meet demand in a portion of northern Monterey County outside CalAm's service area; this area is indicated generally as "North County Groundwater Wells" in **Figure 5-1 in Chapter 5, Regional Project**.

A key purpose of the proposed CWP is to provide replacement water supply to meet existing demands in light of State Water Resources Control Board (SWRCB) Order No. WR 95-10 (Order 95-10) and the Monterey County Superior Court adjudication of water rights in the Seaside Groundwater Basin. Both rulings reduce CalAm's use of its two primary sources of supply for the Monterey District and provide the most immediate impetus for the CWP. Information about these two decisions, with a brief overview of the water supply system for context, is presented in **Section 2.2**. Order 95-10 includes an estimate of the amount of water CalAm would need to replace to meet existing demand and remain within its legal rights to Carmel Valley surface and groundwater. MPWMD more recently has prepared an updated estimate of current demands in the CalAm service area, taking into account more recent usage data, the requirements of Order 95-10 and the Seaside Basin adjudication, and other factors. In consultation with the jurisdictions served by CalAm, MPWMD has also prepared an estimate of water supply needed to meet expected future planned and approved growth within the service area. These estimates of existing and future demands are presented in **Section 2.3**. **Section 2.4** summarizes information on water supplies available to meet the identified current and future demands in the CalAm service area. **Section 2.5** provides information on estimated demands for the portion of northern Monterey County outside the CalAm service area that would be served under the Regional Project alternative.

2.2 Background

2.2.1 Water Use on the Monterey Peninsula

The San Clemente Dam was constructed on the Carmel River in 1921 and continues to be the major point of surface water diversion from the river. Diversion from the San Clemente reservoir was the sole water supply for the Monterey Peninsula until the 1940s when customer demand exceeded that source of supply. CalAm's predecessor installed wells at the upper end of the Carmel Valley to produce water to meet summer demand. The Los Padres Dam was constructed about six miles upstream of the San Clemente Dam in 1949. The Los Padres reservoir is operated in conjunction with the San Clemente reservoir and controls inflow into it. Both dams have been owned and operated by CalAm since 1965. Over the years, sedimentation reduced the usable storage at both the San Clemente and Los Padres reservoirs. By 1995 the primary source of water supply for CalAm was multiple wells located along the lower Carmel River, which supplied approximately 70 percent of CalAm's customer demand. The balance of the water supply was provided by storage at the Los Padres reservoir and diversions from San Clemente reservoir and water pumped from the Seaside Basin.

Water resources in the Carmel Valley and the greater Monterey Peninsula are regulated by the MPWMD. MPWMD has historically restricted CalAm's annual allocation of Carmel Valley

surface and groundwater to 16,683 acre-feet per year (afy)³ (approximately 14.9 million gallons per day [mgd]) (CalAm, 2007). CalAm's use of its Carmel Valley wells is also restricted by an annual Memorandum of Agreement (MOA) between CalAm, MPWMD and the California Department of Fish and Game (DFG). The MOA provides a guideline to minimize localized drawdown from the use of wells located along certain reaches of the river, limits surface water diversions from April to October, and requires releases to the river from San Clemente Reservoir (CalAm, 2007).

In addition to the Carmel River sources, CalAm's main distribution system includes eight wells in the Coastal subarea of the Seaside Basin. The Seaside Basin encompasses a 24-square mile area and is generally bounded by the Pacific Ocean on the west, the Salinas Valley on the north, the Toro Park area on the east, and Highways 68 and 218 on the south. The Basin consists of several subareas in which geologic features form partial hydrogeologic barriers between the subareas. CalAm also has nine wells in the Laguna Seca subarea (CalAm, 2006a). As noted above, wells from this subarea supply several small systems in the Highway 68 corridor east of CalAm's main distribution system. MPWMD limits CalAm usage of the Seaside Basin to 4,000 afy.

2.2.2 State Water Resources Control Board Order No. WR 95-10

The State Water Resources Control Board (SWRCB) Order 95-10 (SWRCB, 1995), issued in July 1995, substantially reduces diversion of all supplies along the Carmel River. In the Order, the SWRCB establishes that CalAm has a legal right to 3,376 acre-feet per year (afy) (equivalent to about 3 million gallons per day [mgd]) from the Carmel River system, including surface water diversions and water pumped from Carmel Valley wells, compared to the 14,106 afy (12.6 mgd) that had been pumped historically. The Order states that CalAm had been diverting approximately 10,730 afy from the Carmel River or its underflow without a valid basis of right, and directs CalAm to diligently undertake the following actions: obtain appropriative rights to the Carmel River water that was being unlawfully diverted; obtain water from other sources and make one-for-one reductions of the unlawful diversions; and/or contract with other agencies having appropriative rights to divert and use water from the Carmel River. In the interim, while CalAm is pursuing the development of an alternative supply, Order 95-10 directs CalAm to implement conservation measures to offset 20 percent of demand⁴ and restricts CalAm to an annual diversion of 11,285 afy (10.1 mgd) from Carmel Valley sources. (This amount represents a 20 percent reduction from CalAm's historic usage of 14,106 afy.) The Order also prohibits water from being diverted from the San Clemente Dam when stream flows reach a predetermined low flow. The Order directs CalAm to maximize use of the Seaside Basin for the purpose of serving existing connections – while honoring existing allocations – to reduce diversions from the Carmel River to the greatest practicable extent. Development of the replacement supply required in Order 95-10 is part of the proposed CWP.

³ An acre foot is the amount of water that would cover an acre to a depth of one foot and is equivalent to approximately 325,850 gallons.

⁴ Order 95-10 requires a conservation reduction, in combination with conservation measures required by MPWMD, of 15 percent in the 1996 water year (WY) and a reduction of 20 percent in each subsequent year.

2.2.3 Seaside Basin Adjudication

Another purpose of the proposed project is to reduce CalAm's reliance on the Seaside Basin, currently CalAm's other principal source of supply for the Monterey District. The Monterey County Superior Court recently issued a final decision in the case, *California American Water v. City of Seaside, et al.*, Case No. 66343 (Monterey County Superior Court, 2006) for the adjudication of water rights of the various parties who produce groundwater from the Seaside Basin. The Court's decision (referred to herein as the Decision or adjudication) resulted from a complaint and cross complaints among the current users of the Seaside Basin. Among other points, the complaint requested a declaration of the parties' individual and collective rights to groundwater and coordination of groundwater management within the Seaside Basin. The establishment of adjudicated water rights of all the users of the Basin is intended to avoid long-term damage to the basin, including potential seawater intrusion, subsidence, and other adverse impacts of over-pumping. The Decision identifies the Natural Safe Yield⁵ for the basin as a whole and for the Coastal and Laguna Seca subareas, and found that production in each of the preceding five years had exceeded the Natural Safe Yield throughout the Seaside Basin and in each of its subareas. The Decision also found (and noted that all the parties agreed on this issue) that continued production in excess of the Natural Safe Yield would result in seawater intrusion, with deleterious effects.

The Decision establishes a physical solution to Basin management that is "intended to ultimately reduce the drawdown of the aquifer to the level of the Natural Safe Yield; to maximize potential beneficial use of the Basin; and to provide a means to augment water supply for the Monterey Peninsula." Among other provisions, the Decision allocates the groundwater rights of the various users, establishes an initial Operating Safe Yield,⁶ and establishes a Watermaster to administer and enforce the provisions of the Decision. The Watermaster consists of representatives of the parties to the complaint as specified in the Decision. CalAm's current allocation, under the initial Operating Safe Yield from the Coastal subarea as allocated by the Watermaster, is 3,504 afy and 345 afy from the Laguna Seca subarea. Since the Operating Safe Yield allocations will be decreased over time until they equal the Natural Safe Yield of the respective subareas, these initial allocations will be reduced. Eventually CalAm's allocation from the Coastal subarea will be 1,494 afy and 0 afy from the Laguna Seca subarea (MPWMD, 2006a).

Table 2-1 summarizes key determinations contained in the Decision and the Seaside Basin Groundwater Account subsequently prepared by the Watermaster that are relevant to the Basin as a whole and CalAm's allocation. For comparison, Table 2-1 also shows the CalAm production level from the Seaside Basin prior to Order 95-10 and the MPWMD allocation for CalAm prior to

⁵ The Decision defines Natural Safe Yield as the quantity of groundwater existing in the Seaside Basin that occurs solely as a result of natural replenishment. The estimate of Natural Safe Yield assumes no action is taken to capture subsurface flow exiting the northern boundary of the Basin.

⁶ The Decision defines Operating Safe Yield (also referred to as Operating Yield) as the maximum amount of groundwater resulting from natural replenishment that the Decision, based upon historical usage, allows to be produced from each subarea for a finite period of years, unless such level of production is found to cause material injury. In general, the Operating Yield for each subarea is to be maintained for three years; starting on the fourth year and triennially thereafter, it is to be decreased by 10 percent until the Operating Yield is the equivalent of the subarea's Natural Safe Yield.

**TABLE 2-1
SEASIDE BASIN OPERATING AND NATURAL SAFE YIELD, AND RECENT PRODUCTION**

Basin Management Element	Quantity
Operating Safe Yield -Entire Basin	5,600 afy
Total Operating Safe Yield -Coastal Subarea (finite period of years)	4,611 afy ^a
Coastal Subarea Operating Safe Yield Committed to Standard Production Allocations	3,868 afy ^a
Coastal Subarea Operating Safe Yield Committed to Alternative Production Allocations	743 af ^a
CalAm's Standard Production Allocation of Operating Safe Yield - Total Coastal Subarea (%)	77.55 percent
CalAm's Standard Production Allocation of Available Coastal Operating Yield (in Excess of Alternative Production Allocations)	90.6 percent ^b
CalAm's Standard Production Allocation of Operating Safe Yield as of 2007 - Coastal Subarea (AF)	3,504 afy ^b
Total Operating Safe Yield -Laguna Seca Subarea (finite period of years)	989 afy ^a
Laguna Seca Subarea Operating Safe Yield Committed to Standard Production Allocations	345 afy ^a
Laguna Seca Subarea Operating Safe Yield Committed to Alternative Production Allocations	644 afy ^a
CalAm's Standard Production Allocation of Operating Safe Yield - Total Laguna Seca Subarea (%)	45.13 percent
CalAm's Standard Production Allocation of Available Laguna Seca Operating Yield (in Excess of Alternative Production Allocations)	100 percent ^b
CalAm's Standard Production Allocation as of 2007 - Laguna Seca Subarea (af)	345 af ^b
Natural Safe Yield - Entire Basin	2,581 - 2,913 afy
Natural Safe Yield - Coastal Subarea	1,973 - 2,305 afy
CalAm's Eventual Allocation - Coastal Subarea (77.55% of Natural Safe Yield, Standard Allocation) (af)	1,494 afy
Natural Safe Yield - Laguna Seca Subarea	608 afy
CalAm's Eventual Allocation - Laguna Seca Subarea (0% of Natural Safe Yield, Standard Allocation) (af)	0
CalAm Seaside Basin Production when Order 95-10 was issued	2,700 afy
CalAm Average Annual Production, Water Years 1996-2006, Coastal Subarea	3,695 afy
CalAm Average Annual Production, Water Years 1996-2006, Laguna Seca Subarea	432 afy
MPWMD Allocation for CalAm for the Coastal Subarea Prior to the Adjudication	4,000 afy

NOTE: afy = acre feet per year.

^a Initial Operating Safe Yield was established for the first three years; at the beginning of the fourth year and triennially thereafter, it is to be decreased by 10 percent until it is equivalent to the Natural Safe Yield. The decision provides for possible revisions of established Operating Safe Yield based on findings of the Watermaster.

^b CalAm's Standard Production Allocations are based on the table, "Seaside Basin Groundwater Account Per Amended Decision, Dated February 9, 2007," prepared by the Seaside Basin Watermaster.

SOURCES: Monterey County Superior Court, 2006; Monterey County Superior Court 2007; Seaside Basin Watermaster, 2007; MPWMD, 2006a.

the Seaside Basin adjudication. Although CalAm submitted its application and Proponent's Environmental Assessment (PEA) (CalAm, 2005) for the proposed project before the final Decision was issued, CalAm expected its Seaside Basin allocation to be reduced and therefore included in the proposed CWP 1,000 afy to be used to replace that amount of the current Seaside Basin allocation. As described in Section 2.3.1, MPWMD prepared a technical memorandum updating the estimates of existing demand to account for the difference between CalAm's estimate and the final adjudication decision and other factors.

2.3 California American Water Service Area Demands

Based on SWRCB Order WR 95-10 and the Seaside Basin adjudication, CalAm must develop replacement water supply in the first instance to meet existing water demands within its service area. In addition, based on the level of growth envisioned to occur in the adopted general plans of jurisdictions within the service area, additional water supply will be needed to meet future service area demand. The information presented in this section is based primarily on MPWMD's analyses of existing and future demands for the area.

2.3.1 Existing Demands

2.3.1.1 CalAm's Main Distribution System

As discussed above, when Order WR 95-10 was issued, existing demand from the Carmel River system (as indicated in the Order) was estimated to be 14,106 afy. This estimate represented the average, non-drought use for the years 1979 to 1988, based on information submitted to the SWRCB by CalAm (SWRCB, 1995). Based on the estimate of 14,106 afy total production, of which CalAm was found to have a legal water right to use 3,376 afy, the SWRCB estimated that CalAm would need to develop 10,730 afy in replacement supplies. According to Order 95-10, CalAm provided service to about 105,000 persons and supplied a total of approximately 17,000 acre feet (af) in an average normal year. Of this, approximately 2,700 afy came from the Seaside Basin (i.e., 2,700 afy was from the Seaside Basin and 14,106 afy was from the Carmel River, for a total of 16,806, or approximately 17,000 afy) (SWRCB, 1995). CalAm's application to the CPUC and the PEA for the proposed project specify that 10,730 afy would be needed to replace supply from the Carmel River system in compliance with Order 95-10 and that approximately 1,000 afy would be needed to replace supply currently drawn from the Seaside Basin (in anticipation of the Seaside Basin adjudication, which was not final at the time).

MPWMD recently prepared a technical memorandum updating estimates of existing demand within the District and CalAm service area (MPWMD, 2006a). (This memorandum, Technical Memorandum 2006-02, is included as **Appendix B** of this EIR.) MPWMD's estimates of replacement water needed to meet existing demand within the service area and vicinity are described below and summarized in **Table 2-2**.

**TABLE 2-2
REPLACEMENT SUPPLY NEEDED TO MEET EXISTING DEMAND WITHIN THE CAW SERVICE AREA (afy^a)**

Water Supply	PEA Demand (Replacement) (afy^a)	Source / Explanation	Updated Demand^b (Replacement) (afy^a)	Source / Explanation
Carmel River Replacement	10,730	<u>SWRCB Order No. WR 95-10 (SWCRB, 1995) and Proponent's Environmental Assessment (PEA) (CalAm, 2005)</u> . Estimate is based on Carmel River diversions of 14,106 afy minus CalAm's legal water right, per Order No. WR 95-10, of 3,376 afy.	8,498	<u>MPWMD Technical Memorandum 2006-02</u> (MPWMD, 2006a). Existing average annual production from the Carmel River was updated based on usage in water years 1996-2006 (11,015 afy) and adjusted for weather (by 7.8 percent) resulting in an average, weather-adjusted demand from Carmel River sources of 11,874 afy, minus CalAm's legal right of 3,376 afy.
Seaside Groundwater Basin Replacement (Entire Basin)	1,000	<u>PEA (CalAm, 2005)</u> . When Order 95-10 was issued, CalAm produced about 2,700 afy from the Seaside Basin. Following Order 95-10 and prior to the Seaside Basin adjudication, CalAm's allocation set by MPWMD was 4,000 afy. The PEA estimated that CalAm would need to develop 1,000 afy of supply to replace a portion of its existing basin production.		
Seaside Groundwater Basin - Coastal Subarea			2,489	<u>MPWMD Technical Memorandum 2006-02</u> (MPWMD, 2006a). Based on water years 1996-2006, CalAm's average annual production from the Coastal Subarea (3,695 afy) adjusted for weather is 3,983 afy, minus CalAm's eventual allocation ^c of 1,494 afy.
Seaside Groundwater Basin - Laguna Seca Subarea			466	<u>MPWMD Technical Memorandum 2006-02</u> (MPWMD, 2006a). Based on water years 1996-2006, CalAm's average annual production from the Laguna Seca Subarea (432 afy), adjusted for weather, is 466 afy. minus CalAm's eventual allocation ^c of 0 afy.
Carmel River Surface Supply - Los Padres Reservoir			762	<u>MPWMD Technical Memorandum 2006-02</u> (MPWMD, 2006a). Based on continuing sedimentation of the Los Padres Reservoir, MPWMD estimates that 762 acre feet of capacity has been lost since Order 95-00 was issued. Unless this capacity is restored, this amount of replacement supply would be needed to meet existing demand.
Subtotal: CalAm Service Area	11,730		12,215	
Seaside Groundwater Basin - Non-CalAm Production			272	Adjudication of water rights in the Seaside Basin reduced the amount of water other producers may extract to prevent long-term damage to the Basin. The eventual allocation of other producers will require replacement of 272 afy to meet existing demand.
Total Existing Need for Replacement Supply	11,730		12,500 (12,487 rounded)	

^a afy = acre-feet per year.

^b Updated demand based on MPWMD Technical Memorandum 2006-02.

^c The Seaside Basin Decision establishes an initial allocation for each producer for the first four years following the decision, and provides that after the fourth year the allocation will be reduced by 10 percent every three years until withdrawals equal the Basin's Natural Safe Yield. CalAm's "eventual allocation" refers to CalAm's allocation assuming the Natural Safe Yield level of production.

SOURCE: CalAm, 2005; MPWMD, 2006a.

As part of its analysis of existing demand, MPWMD reviewed actual monthly water use for water years⁷ 1996 to 2006, based on CalAm monthly production reports for its Carmel River and Seaside Basin Coastal Subarea sources, to determine the annual average quantity of water currently used by CalAm customers within MPWMD boundaries. Given the regular occurrence of drought periods on the Monterey Peninsula and the effect of weather on water demand, MPWMD also evaluated weather conditions during the years reviewed, which on average were wetter than normal, and developed demand estimates adjusted to reflect normal, dry, and critically dry conditions. The average annual unadjusted demand and weather-adjusted demand for the years reviewed are as follows (MPWMD, 2006a):

- Unadjusted Demand: 14,710 AF
- Normal-year demand: 15,095 AF
- Dry-year demand: 15,474 AF
- Critically-dry-year demand: 15,858 AF

MPWMD considers the critically-dry year values to provide a worst-case basis⁸ for assessing the effect of weather on water production during the analysis period and that the demand values adjusted to reflect critically dry conditions – rather than the unadjusted values, which do not account for the wetter-than-normal conditions during the period of analysis – should be used for water supply planning (MPWMD, 2006a). **Table 2-3** shows the breakdown of unadjusted average annual demand and adjusted (by 7.8 percent) critically-dry year demand for the Carmel River system and Seaside Basin Coastal subarea. As shown, the unadjusted average annual production over this period is 14,710 afy, and adjusted critically dry year demand is 15,858. From these totals, MPWMD deducted the quantity of Seaside Basin and Carmel River water to which CalAm has an existing legal right (4,870 afy) to determine the replacement water supply needed to meet demand under the conditions reflected in the unadjusted and critically dry year scenarios. As shown in Table 2-3, assuming critically-dry year demand for the two areas minus CalAm’s combined recognized water rights, approximately 10,987 AF of replacement water would be needed to meet current demand in the areas served by these sources. Unlike Table 2-2, Table 2-3 shows only demand for Carmel River and Seaside Basin -Coastal Subarea sources. It excludes the Laguna Seca Subarea, which CalAm does not consider to be part of the CWP (CalAm, 2007). Nor does Table 2-3 include the lost capacity from Los Padres Reservoir sedimentation included in MPWMD’s estimate shown in Table 2-2. Other existing demands and needed replacements supply that will need to be met and are included in Table 2-2 are discussed further in the next section.

⁷ A water year extends from October 1 through September 30 of the following year; it is identified by the calendar year in which it ends (i.e., water year [WY] 2006 extends from October 1, 2005 through September 30, 2006).

⁸ Water usage data indicate that there is more irrigation and people drink more water in the hotter dryer weather associated with dry years, driving up demand.

TABLE 2-3
SUMMARY OF AVERAGE ANNUAL PRODUCTION, WATER YEARS 1996-2006
CARMEL RIVER AND SEASIDE BASIN COASTAL SUBAREA
ADJUSTED FOR WEATHER CONDITIONS (afy^a)

	Unadjusted demand (average water year)	Critically-Dry-Year Demand
Carmel River System Demand	11,015	11,874
Seaside Basin Coastal Subarea Demand	3,695	3,983
Subtotal	14,710	15,858
Minus Legal Water Rights to Carmel River System and Seaside Basin Water	4,870	4,870
Total Replacement Water Needed	9,840	10,988

NOTE: Numbers may not sum due to rounding.

^a afy = acre-feet per year.

SOURCE: MPWMD, 2006a.

2.3.1.2 Other Existing Demands

CalAm's Laguna Seca Subarea Demands

The average annual unadjusted demand for the same period (1996-2006) from the Laguna Seca subarea of the Seaside Basin was 432 afy. MPWMD applied the same adjustment factor used for the Carmel River and Seaside Coastal subarea (7.8 percent) to calculate the critically-dry-year demand for this subarea of 466 afy. CalAm's adjudicated allocation from this subarea will eventually be zero. Therefore, assuming critically-dry-year demand, eventually 466 afy replacement water would be needed to meet CalAm customer demand currently supplied by this subarea.

Los Padres Reservoir Storage Capacity Loss

The MPWMD's analysis of existing demand also addresses the potential loss of storage capacity in the Los Padres Reservoir (due to ongoing sedimentation), because such loss of capacity could affect the amount of replacement water CalAm needs to develop in order to comply with Order 95-10. The MPWMD analysis points out that, in Order 95-10, the SWRCB reduced CalAm's right to divert surface water to storage in Los Padres Reservoir (from CalAm's initial licensed right of 3,030 afy to the company's 1984 estimate of storage capacity of 2,179 afy) based on the premise that the legal right to divert water to storage is limited by the physical ability to store the water. MPWMD addresses the possibility that the SWRCB could revisit Order 95-10 and, by applying the same logic, further reduce CalAm's right to divert water to storage based on the additional loss of capacity.

In the assessment of Los Padres Reservoir storage capacity, MPWMD notes that the 1984 estimate of storage capacity provided to the SWRCB by CalAm, and used as the basis for provisions in Order 95-10, was likely in error as it was inconsistent with previous and subsequent

capacity estimates. Based on a 1978 USGS estimate of 1,950 AF, which MPWMD concluded was more accurate than the 1984 estimate, and a 1998 estimate of capacity by CalAm of 1,569 AF, MPWMD calculated that capacity had decreased by an average rate of 19 afy between 1978 and 1998. Based on this assumed annual sedimentation rate, MPWMD estimated that an additional 152 af of reservoir capacity had been lost in the eight years since the 1998 estimate, resulting in current storage capacity of approximately 1,417 af (MPWMD, 2006a).

Based on the difference between MPWMD's revised estimate of current reservoir capacity (1,417 af) and the estimated capacity assumed in Order 95-10 (of 2,179 af), MPWMD estimates that an additional 762 af of replacement water supply would be needed to offset lost storage capacity.

Replacement Supply Needed for Non-CalAm Water Producers

MPWMD's analysis of needed replacement supply assumed that the project or projects developed by CalAm to provide replacement supplies would be sized to meet the existing water needs of other Seaside Basin producers whose legal rights had also been reduced in the adjudication. In its technical memorandum describing its analysis of existing needs (MPWMD, 2006a), MPWMD notes that while CalAm is not directly responsible for developing replacement supply for non-CalAm producers in the Seaside Basin, it was reasonable to assume, based on economies of scale, that CalAm would be able to provide the least cost replacement supplies for the non-CalAm Seaside Basin producers as part of the proposed project. According to MPWMD this assumption is consistent with Section III.M.1, California American's Obligations to Augment Water Supply, in the Seaside Basin adjudication decision (MPWMD, 2006a). Based on these considerations, MPWMD's analysis of existing water needs also considers the need for additional replacement supply due to the effect of the Seaside Basin adjudication on other (non-CalAm) water producers within the Basin. As with CalAm, the adjudicated water rights of the other producers that use the Seaside Basin are less than the amount they had been pumping. Although the areas served by these producers are outside CalAm's service area, the reduction in supply of the other producers creates an additional shortfall that will need to be addressed in order to meet current water needs for the immediate Monterey Bay area vicinity.

Based on production records for the Seaside Basin Coastal subarea, the other producers in this subarea used an average of 316 afy from 1996 through 2005. MPWMD applied the same adjustment factor used for CalAm production (7.8 percent) to estimate that critically-dry-year demand for non-CalAm producers in the Coastal subarea would be 341 afy. The eventual allocation for these producers, pursuant to the Seaside Basin adjudication, will be 155 afy. Therefore, 186 afy of replacement supply would be needed for these producers to meet their existing level of demand.

MPWMD similarly evaluated production volumes of the other producers in the Laguna Seca subarea over the same period (1996-2005). In this subarea, however, MPWMD observed a substantial increase in demand in the most recent five years (an average of 644 afy was produced from water years 2001 through 2004, compared to an average of 418 afy for the entire period). MPWMD therefore used the average production for water years 2001 through 2005 as a more

accurate reflection of current pumping levels. MPWMD applied the same adjustment factor used for CalAm production figures and non-CalAm Coastal subarea production to estimate that critically-dry-year demand for the non-CalAm producers in the Laguna Seca subarea would be 694 afy. The eventual allocation for these producers, pursuant to the Seaside Basin adjudication, will be 608 afy. Therefore, 86 afy of replacement supply would be needed for the other producers in the Laguna Seca subarea to meet their existing level of demand.

Therefore, based on these estimates for the Coastal and Laguna Seca subareas, MPWMD estimates that the total replacement supply needed to meet existing demands of the other producers in the Seaside Basin would be 272 afy. With CalAm's needed replacement supply of 12,215, the total updated demand including the other produces is 12,487afy (rounded to 12,500), as shown in Table 2-2.

2.3.1.3 UWMP Demand Estimates

CalAm's Monterey District Urban Water Management and Water Shortage Contingency Plan (UWMP) (CalAm, 2006a) also includes information on CalAm's near-term demands. According to water production information presented in the UWMP, CalAm's Monterey District produced 15,184.7 af in 2005, all of which was from wells. Demand projections included in the UWMP also include an estimate of 15,550 af for 2005, which assumes that the Stage 1 conservation program implemented by MPWMD in 1999 continues to be in effect. This is slightly higher (358 af) than MPWMD's average demand unadjusted for weather and somewhat lower (823 af) than MPWMD's total weather adjusted demand.

2.3.2 Future CalAm Service Area Demand - General Plan Buildout

2.3.2.1 MPWMD Projections

Based on information provided by each jurisdiction, MPWMD developed a projection of water supply needed to meet the level of growth anticipated in the jurisdictions' adopted general plans. Each jurisdiction provided MPWMD with its estimate of the number of residential units and non-residential square footage that would be developed under buildout of the applicable currently-adopted general plan. In general, projections of residential development included the number of single family units, multifamily units, secondary units, and residential remodels. Projected non-residential development included information on commercial, industrial, public, and other land uses provided for in the general plan. Water use factors developed based on actual water use by various land use types within the district were then applied to project future water demands associated with the projected growth. A "contingency" component equivalent to 20 percent of demand based on general plan buildout was included for each jurisdiction. The contingency component is intended to address (among other contingencies) an increase in demand that is expected from a relaxation of current conservation restrictions (required to comply with Order 95-10) when additional water supply is available. A summary of the District's estimate of additional long-term water needs by jurisdiction is shown in **Table 2-4**. The table

TABLE 2-4
ESTIMATED LONG TERM WATER NEEDS BY JURISDICTION
BASED ON GENERAL PLAN BUILD-OUT: NEEDS BEYOND CURRENT DEMAND (afy^a)

Jurisdiction	Single-Family Dwellings (afy ^a)	Multi-Family Dwellings (afy ^a)	Second Units (afy ^a)	Non Residential (afy ^a)	Residential Remodels (afy ^a)	20% Contingency (afy ^a)	Residential Retrofit Credit Repayment ^b (afy ^a)	Total Acre- Feet Needed
City of Carmel	19	56	25	20	120	48		288
City of Del Rey Oaks	5			30	5	8		48
City of Monterey	46	426		123		109	0.526	705
City of Pacific Grove	73	376	298	260	43	210	3.545	1,264
City of Sand City	48	68		210		60		386
City of Seaside	133	21	44	283	4	97	0.023	582
Monterey County (Unincorporated)	892			10	37	188	8.134	1,135
Monterey Peninsula Airport District				115		23		138
Total	1,216	947	367	1,051	209	743	12	4,545

^a afy = acre-feet per year.

^b MPWMD Ordinance 90 allows the reinvestment of retrofit water savings from toilet retrofits on single-family residential properties. The retrofit credit is accounted for by the MPWMD for each jurisdiction and is deducted from the jurisdiction's next available water allocation.

SOURCE: MPWMD, 2006b.

reflects *future* annual water demands expected to result from buildout of the general plans, and is in addition to existing water demands. Since the different jurisdictions prepare and adopt their general plans at different times, the expected buildout-year represented by these estimates is 2020 to 2025, depending on the planning horizon of each jurisdiction's general plan. The estimate of water needed to meet these future demand is 4,545 afy.

2.3.2.2 UWMP Demand Projections

CalAm's UWMP (CalAm, 2006a) cites several sources and several estimates of future demand⁹, including:

- a projection that a total of 26,450 afy would be needed in 2025 (an addition of approximately 10,000 afy above current demand), from an evaluation of potential maximum build out prepared by MPWMD in the 1990s and based on planning and zoning designations in effect in 1988;
- a more recent study conducted in conjunction with the EIR prepared for the New Los Padres Dam and Reservoir project, which CalAm proposed in the 1990s following issuance of Order 95-10, which indicated an increase of 3,570 afy would be needed by 2020; and
- a 2001 MPWMD analysis based on a review of vacant legal lots of record, which indicated additional demand of 1,181 afy.

The UWMP notes that, although estimates may vary depending on the assumptions used, there is demand for additional water above that needed to replace Carmel River supply pursuant to Order 95-10. The estimates developed by MPWMD (MPWMD, 2006b) represent a refinement of earlier estimates, developed in consultation with the cities in its jurisdiction, and supersede the earlier estimates that are cited in the UWMP.

2.4 Available Supplies

This section summarizes information on water supplies available to meet existing and projected future demand within the CalAm service area.

2.4.1 Existing supplies

CalAm's principal existing supply sources are the Carmel River sources (groundwater and surface water) and the Seaside Basin, as discussed in Section 2.3 in the context of replacement supplies that are needed. Existing supplies from these sources are shown in **Table 2-5**. As discussed in Section 2.2, the SWRCB granted CalAm's interim use of Carmel River water above its recognized water rights while it develops replacement supply. This level is shown in the table for current (2007) supply only, although this level of interim use potentially could be allowed for

⁹ Two of the three studies referenced in the UWMP were by the MPWMD. As discussed in the preceding section, MPWMD's current estimate of future demands for the CalAm service area is based on a recent (2005) analysis that uses jurisdictions' build out estimates based on the jurisdictions' currently adopted general plans.

**TABLE 2-5 TABLE
AVAILABLE WATER SUPPLIES - CALAM SERVICE AREA (afy^a)**

Source of Supply	2007	2010	2015	2020	2025	2030
Carmel River System						
Carmel River System - CalAm Recognized Water Rights	3,376	3,376	3,376	3,376	3,376	3,376
Carmel River System - Interim Limit over CalAm Recognized Water Rights Provided in Order WR 95-10 ^b	7,909					
Seaside Basin						
Coastal Subarea ^{c,d}	3,504	3,087	2,711	2,068	1,794	1,494
Laguna Seca Subarea ^{c, d}	345	246	157	5	0	0
Subtotal Existing Carmel River and Seaside Basin Sources	11,758	6,709	6,244	5,449	5,170	4,870
Aquifer Storage and Recovery Phase 1 ^e		920	920	920	920	920
Subtotal Existing Sources	15,607	10,962	10,032	8,442	7,884	7,284
Other Potential Supply Projects						
Expansion of Pebble Beach recycled water project ^g			136	136	136	136
Unaccounted for Water Recovery	300	300	300	300	300	300
Sand City Desalination ^f		300	300	300	300	300
Subtotal – Other Potential Supplies	300	600	736	736	736	736

^a afy = acre-feet per year.

^b Order WR 95-10 provides that CalAm may draw 11,285 afy on a temporary basis until replacement supplies needed to meet demand in excess of CalAm's recognized legal water rights of 3,376 is developed. The Order provides for the interim limit to protect public health and directs CalAm to diligently undertake actions to obtain replacement water supply needed to meet demands above 3,376 afy, without specifying a time by which the interim limit would no longer be allowed.

^c Seaside Basin allocations for 2007 are based on the 2007 allocations set by the Seaside Basin Watermaster. Coastal subarea allocations in future years were calculated assuming that CalAm continues to receive 90.6 percent of the allocation remaining after the alternative producers' portion is deducted, with the triennial reductions until Natural Safe Yield is reached. CalAm's eventual allocation under Natural Safe Yield is assumed to be 1,494 (per MPWMD, 2006a). With the triennial reductions, by 2025 the alternative producers' allocation will exceed the total allocation for the Laguna Seca; therefore, no water would be available for standard allocation producers.

^d Note that CalAm's UWMP assumes somewhat different Seaside Basin allocations from those shown in the table. The UMWP was prepared before the final Seaside Basin Decision was issued and before the initial allocations been established by the Watermaster.

^e Implementation of ASR Phase 1 is expected to reduce CalAm's unlawful diversions from the Carmel River during low flow months (June through November) by an average of approximately 920 af (MPWMD, 2006c).

^f An existing recycled water project provides an average of 664 afy to golf courses and other users for irrigation; the expansion project would increase supply by at least 136 afy, to a total of 800 afy (CalAm, 2006a).

^g Part of the 300 afy to be supplied by this project is expected to offset current demands and part will meet future demands (City of Sand City, 2008).

SOURCE: CalAm, 2006a; MPWMD, 2006a, MPWMD, 2006c, City of Sand City, 2008.

a longer period, depending on the time needed to implement the CWP or develop another source of supply. The Seaside Basin Decision establishes a specific timeline for withdrawals to be reduced until the Operating Yield is equal to the Natural Safe Yield, as also discussed in Section 2.2. As determined by the Watermaster, CalAm's allocation in 2007 is 3,503 afy, which is 90.6 percent of the total remaining allocation for the year after the allocations for producers using the "alternative" allocation method have been subtracted. The quantities shown in Table 2-5

assume that the total allocation will be reduced triennially by 10 percent, as required in the Seaside Basin Decision, and that CalAm will continue to be allocated 90.6 percent of the remaining allocation after the alternative producers' allocations are subtracted.

In addition to these Carmel River and Seaside Basin sources, the MPWMD is implementing Phase 1 of its Aquifer Storage and Recovery (ASR) project, for which environmental review and permitting have been completed. This project entails diversion and conveyance of excess surface flows from the Carmel River during the rainy season (November to May) to the Seaside Basin, where it is injected into the basin (aquifer) for storage and later recovery. When fully operational, Phase 1 of this project will divert up 920 afy¹⁰ from the Carmel River. (As described in Chapter 3, Project Description, the proposed CWP also includes an ASR component.)

2.4.1.1 Conservation

Since MPWMD prepared its Water Conservation Plan for Monterey County in 1989, the agency estimates that conservation savings of 15 to 25 percent have been achieved. Because this level of conservation is reflected in existing demands, it is not deducted from existing demand estimates. According to CalAm's UWMP, since 1995 (when Order 95-10 was issued), CalAm's customers on the Monterey Peninsula reduced water use from more than 17,000 afy to 14,000 afy, a reduction of more than 20 percent (CalAm, 2005). According to information at CalAm's website based on its 2004-05 Water Year Report, Monterey Peninsula customers reduced water consumption by 28 percent between 1987 and 2003 while the number of connections increased by 18 percent. Per capita water use during this period decreased by 37 percent (CalAm, 2006b). Currently, the MPWMD's Stage 1 Conservation Requirements are in effect. In 2007, because the Carmel River watershed had only 55 percent of average rainfall and 17 percent of average run-off, MPWMD determined that 2007 was a "critically dry year." By May of that year, CalAm was close to its pumping limits on the Carmel River and Seaside Basin because of increased demand caused by the dry conditions. As a consequence, MPWMD invoked Stage 1 Conservation requirements. Stage 1 Conservation rules require that all water users in the MPWMD participate and follow specified conservation actions, including limiting outdoor watering to a specified schedule, fixing correctable leaks and malfunctions, and taking other actions to eliminate water waste (MPWMD, 2007).

2.4.2 Potential Future Supplies

2.4.2.1 Water Projects

A number of other projects intended to help provide water supply to the Monterey Peninsula are also shown in Table 2-5. These projects are at various stages of planning, and none of them have been approved. Therefore, the information provided on these projects is for informational purposes only; since these projects have not been approved, it is not certain that they would be implemented.

¹⁰ While the environmental impact report for the MPWMD ASR project evaluated a project that would divert up to 2,464 afy, the project being implemented is for 920 afy.

2.4.2.2 Unaccounted-for Water Recovery

This project is expected to reduce water system losses by 300 afy, based on the assumption that system improvements will reduce the current average unaccounted for water within the CalAm system as a percentage of total production (currently 14,804 af) by 2 percent.

2.4.2.3 Distribution System Considerations

As discussed in Section 2.2, above, diversions via the reservoirs and supplementary wells on the upper Carmel River were originally the primary supply source for the CalAm system. Since the supply shifted to the lower Carmel River and Seaside Basin, CalAm has observed significant operational challenges, as the system was not originally designed to receive water from two different locations. Water generated in the lower Carmel Valley cannot be transferred via the Monterey Peninsula to Seaside due to a hydraulic trough that exists in the area between Monterey and Seaside. For the same reason, water from Seaside wells cannot be transferred via the Monterey Peninsula to Peninsula cities or the Carmel Valley.

Because of this hydraulic trough, water from the Seaside Basin would not be readily available to help meet Carmel Valley demand when the Carmel River supply is reduced pursuant to CalAm's recognized water rights in Order 95-10. According to CalAm, the most effective solution to this problem would be construction of a pipeline connecting Seaside and the Monterey Peninsula to serve as a "hydraulic bridge" and thereby eliminate the hydraulic trough. Such a "bridge" is proposed as part of the CWP (the "Monterey Pipeline") and would allow CWP supply to flow to Carmel Valley and supply the entire system (CalAm, 2007). Whether or not the CWP was implemented, the existence of the hydraulic trough needs to be taken into account in considering the availability of supplies to meet existing and future demands within the CalAm service area.

2.5 Regional Water Demands

In its 2003 Decision D.03-09-022 (which established the CPUC as the lead agency for the proposed project), the CPUC observed that water supply issues were of interest not only to CalAm customers but to Monterey County as a whole, and directed CalAm to "thoroughly explore opportunities for partnerships with other regional water supply entities as [CalAm] prepares its PEA and incorporate such partnerships in the project if appropriate" (CPUC, 2003). As a consequence, the proposed project includes a Regional Project, as discussed in more detail in Chapter 5. Under this alternative, the CWP would provide water supply to areas of the county outside CalAm's service area. In addition to CalAm's Monterey District, this project alternative would include water service to areas of northern Monterey County. This area is currently served by the Pajaro/Sunny Mesa Community Services District and the Castroville Water District. The Regional Project also includes service to the Marina Coast Water District¹¹, which is located directly north of the CalAm service area. **Table 2-6** shows estimated future demands for the areas outside the CalAm service area that would be served under this alternative, as presented in the PEA and updated by MPWMD.

¹¹ As shown in Table 2-6, the Regional Project would provide water for only part of the MCWD service area: the former Fort Ord area included within the MCWD, and replacement water for a desalination plant that is no longer operating.

**TABLE 2-6
FUTURE DEMANDS OUTSIDE THE CAW SERVICE AREA (afy^a)**

Area/Existing Water District	PEA Demand Estimate (afy^a)	Source for PEA Estimate	MPWMD Updated Demand Estimate (afy^a)	Source for Updated Estimate / Additional information
Marina Coast Water District				
Marina Coast Water District (MCWD)	2,400	Fort Ord Base Reuse Plan, 1997	2,700	Monterey Regional Water Supply Program (RMC, 2008). According to RMC, the demand estimate is based on MCWD's Urban Water Management Plan (UWMP). The UWMP shows 2,400 afy for the former Fort Ord area demand (under current development restrictions, as shown in the Base Reuse Plan) and assumes that a 300 afy MCWD desalination facility is operational and meeting that that level of demand; since the desalination plant is not operational, RMC added the 300 afy to the UWMP estimate of future needs. The Base Reuse Plan has received CEQA review and the project has been approved.
Subtotal - MCWD	2,400		2,700	
North County				
Moss Landing	70	See note b		Included as part of North County estimate (below).
North County	1,500	See note b	4,900	Monterey Regional Water Supply Program (RMC, 2008). The total includes 3,039 afy for North County, based on the water gap stated in a May 5, 1998 Monterey County Water Resources Agency (MCWRA) Memorandum to Files (MCWRA, 1998), 70 afy for Moss Landing, and 1,800 afy for the area served by Pajaro Sunny Mesa Community Services District (PSMCSD). Based on MCWRA communications with RMC, Moss Landing and PSMCSD are included with the North County estimate to avoid double counting (RMC, 2008).
Castroville Community Services District	1,000	See note b	1,000	PEA ^c
Subtotal - North County	2,570		5,900	
Total: Future Regional Demand	4,970		8,600	

^a AFY = acre-feet per year.

^b The PEA states that the water demand estimates in the PEA are based on a preliminary survey conducted by the Monterey County Water Resources Agency.

^c Estimate is based on information in the PEA Projection Description (which indicates 1,000 afy for Castroville); Chapter 8 of the PEA shows 1,216 afy.

SOURCE: CalAm, 2006a; RMC, 2008.

2.6 References

- California American Water (CalAm). *Proponent's Environmental Assessment: Coastal Water Project*, July 14, 2005.
- California American Water (CalAm). *Monterey District Urban Water Management and Water Shortage Contingency Plan 2006-2010*, February 2006 Revision, 2006a.
- California American Water (CalAm). Water Supply: "How is the Monterey Peninsula community conserving water?" www.montereywaterfacts.com/www/docs/3.229; web page last updated August 17, 2006b. (Website accessed November 23, 2008.)
- California American Water (CalAm). Existing System Description: Monterey District California America Water, Western Region, provided in response to EIR data request April 4, 2007.
- California Public Utilities Commission (CPUC). Decision 03-09-022: Decision Resolving Motion by California American Water Company Regarding Designation of Lead Agency and Ratemaking Issues, September 4, 2003.
- City of Sand City, Water Desalination, www.sandcity.org/water/desalination.htm, website accessed November 22, 2008.
- Monterey County Water Resources Agency (MCWRA), Memorandum to MCWRA Files from Jan Sweigert, Subject: 2030 Land Use and Water Needs Conditions, May 5, 1998.
- Monterey County Superior Court. California American Water, Plaintiff, vs. City of Seaside, et al., Case No. M66343, Decision. Filed March 27, 2006.
- Monterey County Superior Court. California American Water, Plaintiff, vs. City of Seaside, et al., Case No. M66343, Order Re: (1) Watermaster's Post-Judgment Petition; and (2) Joint Post-Judgment Motion to Request Clarification of the Court's Final Decision Relating to the Calculation of the Over-Production Replenishment Assessment, February 7, 2007.
- Monterey Peninsula Water Management District (MPWMD), *Draft Technical Memorandum 2006-02, Existing Water Needs of Cal-Am Customers within MPWMD Boundaries and Non Cal-Am Producers within the Seaside Groundwater Basin Adjusted for Weather Conditions During Water Years 1996 through 2006*, prepared by Darby W. Fuerst, PH 05-H-1658, Senior Hydrologist, October 2006a.
- Monterey Peninsula Water Management District (MPWMD), Estimated Long-Term Water Needs by Jurisdiction Based on General Plan Build-out in Acre-Feet, Exhibit 1-C of Special Meeting/Board Workshop Agenda Item 1, MPWMD Board of Directors Packet, May 18, 2006b, www.mpwmd.dst.ca.us/asd/board/boardpacket/2006/20060518/01/item1_exh1c.htm.
- Monterey Peninsula Water Management District (MPWMD), *Final Environmental Impact Report/Environmental Assessment for the Monterey Peninsula Water Management District Phase 1 Aquifer Storage and Recovery Project*, State Clearinghouse #2004121065, August 2006c.

Monterey Peninsula Water Management District (MPWMD), Stage 1 Conservation Requirements, <http://www.mpwmd.dst.ca.us/wdd/NewWDDsiteinfo/Stage1/Stage1Conservation050307.htm>. Website accessed September 24, 2007.

Monterey Peninsula Water Management District (MPWMD), www.mpwmd.dst.ca.us/, accessed June 2008.

RMC Water and Environment (RMC), *Monterey Regional Water Supply Program EIR Project Description*, June 4, 2008.

Seaside Basin Watermaster, "Seaside Basin Groundwater Account Per Amended Decision, Dated February 9, 2007," table of Seaside Basin Groundwater Account Production Allocations, www.Seasidebasinwatermaster.org/sbwmARC.html. Website accessed August 2007.

State Water Resources Control Board (SWRCB). Order No. WR 95-10: Order on Four Complaints Files Against The California-American Water Company, Carmel River, Monterey County. July 6, 1995.