

**Third Supplemental
Expert Report and Recommendations of**

Peter Mayer, P.E.

**Regarding Water Supply and Demand in the
California American Water Company's Monterey
Main System Under a Five-Year Drought**

Prepared for:

The Marina Coast Water District

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TABLE OF CONTENTS

TABLE OF CONTENTS.....	1
LIST OF TABLES.....	2
LIST OF FIGURES.....	2
SCOPE OF INVESTIGATION.....	3
ANALYSIS AND RECOMMENDATIONS.....	5
Overview.....	5
Water Demand Forecasts.....	5
Water Supply Under Drought Conditions.....	6
Water Supply for the Monterey Main System.....	6
Supply and Storage Reserves During a Continuous Five-Year Drought.....	15
SUMMARY.....	19
Appendix A – Materials Considered.....	20
Appendix B – Urban Water Management Plan Drought Risk Assessment Table.....	21

LIST OF TABLES

Table 1: Cal-Am Monterey Main System water supply sources under normal and drought conditions, 2022 - 2030	8
Table 2: Cal-Am water supply (2020 – 2030) under a five-year drought occurring 2022-2026.....	9
Table 3: Cal-Am water storage reserves (2020 – 2030) under a five-year drought occurring 2022-2026	9
Table 4: Cal-Am Urban Water Management Plan Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b).....	10

LIST OF FIGURES

Figure 1: Cal-Am water supply and storage reserves (2020 – 2030) under a five-year drought occurring 2022-2026.....	16
Figure 2: Cal-Am water supply by source and storage reserves (2020 – 2030) under a five-year drought occurring 2022-2026.....	17
Figure 3: Cal-Am Seaside Basin storage reserves by source (2020 – 2030) under a five-year drought occurring 2022-2026.....	18

SCOPE OF INVESTIGATION

This report is intended as a third supplement to the report WaterDM submitted to the Marina Coast Water District on April 21, 2020 and supplemental reports WaterDM submitted on July 1, and September 11, 2020 that expanded on the research, analysis, and forecasts prepared for the original report.

For this third supplement, I was specifically asked to analyze the impact of a continuous five-year drought on the California-American Water Company (“Cal-Am”) within its Monterey Main system, as is now required for water planning in California, and to determine Cal-Am’s capacity to manage through such an event. The report assumes that Cal-Am will eliminate all illegal Carmel River diversions by December 31, 2021, in accordance the Cease and Desist order.¹

My opinions are based on my understanding of the information available as of the date of this report and my experience evaluating municipal and industrial water supplies and demands and conservation measures. In forming my opinions, I also considered the documents, testimony, and other materials listed in Appendix A. Should additional information become available to me, I reserve the right to supplement this report based on any additional work that I may conduct based on my review of such materials.

¹ SWRCB Order 2016-0016

SUMMARY OF OPINIONS AND CONCLUSIONS

As a result of my review of the items listed in Appendix A and other related and relevant documents and reports, my own independent analysis, and my expertise in municipal and industrial water use, water management, and engineering, I offer the following analysis and opinions regarding Cal-Am's ability to manage through a five-year drought:

With the addition of the Pure Water Monterey Expansion, Cal-Am has sufficient supplies in the event of a five-year continuous drought, while still complying with the cease and desist order by eliminating all illegal diversions from the Carmel River by December 31, 2021.

Sections 10631 and 10635 of the State of California Water Code now require every urban water supplier in the state to provide an assessment of water supply for "a drought lasting five consecutive water years."² The California Department of Water Resources (DWR) Urban Water Management Plan Guidebook 2020 includes Table 7-5, Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b), which provides guidance on how urban providers are to comply with the five-year drought planning requirement.

Building on the analyses prepared in WaterDM's expert report³ and supplements^{4,5}, a five-year drought risk assessment was prepared for the Cal-Am Monterey Main system in accordance with the State of California's planning requirements. This risk assessment includes a five-year continuous drought, mandated reduction of Cal-Am's illegal water withdrawals from the Carmel River in accordance with provisions of a cease-and-desist order from the State Water Resources Control Board, and fulfillment of Cal-Am's obligation to the Seaside Basin to leave 700 acre-feet per year (AFY) as payback for over-drafting the Seaside Basin.

During a continuous five-year drought, the most significant potential impact to Cal-Am's current supply portfolio would be the inability to divert any water to its aquifer storage and recovery (ASR) project that usually captures excess Carmel River winter flows. The arrival of water from the Pure Water Monterey Expansion project starting in the second year of the drought, and an annual 5% - 10% reduction in demand through mandatory drought restrictions, enables Cal-Am to manage through a five-year continuous drought while maintaining at least 5,800 acre-feet (AF) of underground storage reserve.

² California Water Code Sections 10631 (effective Jan. 1, 2020) and 10635 (effective Jan. 1, 2019).

³ WaterDM. April 21, 2020. Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

⁴ WaterDM. July 1, 2020. Supplemental Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

⁵ WaterDM. September 11, 2020. Second Supplemental Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

ANALYSIS AND RECOMMENDATIONS

Overview

Beginning in January 2022, the California-American Water Company (“Cal-Am”) must reduce its water diversions from the Carmel River system in accordance with provisions of a cease-and-desist order from the State Water Resources Control Board. The purpose of this report is to analyze the impact of a continuous five-year drought on the Cal-Am Monterey Main system, as is now required for water planning in California, and to determine Cal-Am’s capacity to manage through such an event given anticipated supply and demand conditions and constraints.

Sections 10631 and 10635 of the State of California Water Code now require every urban water supplier in the state to provide an assessment of water supply for “a drought lasting five consecutive water years.”⁶ The California Department of Water Resources (DWR) Urban Water Management Plan Guidebook 2020 includes Table 7-5, Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b), which provides guidance on how urban providers are to comply with the five-year drought planning requirement.

Water Demand Forecasts

In its April 21, 2020 report, WaterDM prepared two forecasts for the Cal-Am Monterey Main System to estimate future average annual production, inclusive of treatment losses and non-revenue water.⁷ This results in a higher demand forecast than one based only on metered consumption. The growth rate in each forecast is based on the Association of Monterey Bay Area Governments’ 2018 forecast of anticipated population increase from 2020 to 2040.⁸

The WaterDM forecasts are conservative and notably, both of these forecasts are higher than the forecasts Cal-Am itself produced for its most recent General Rate Case Application, which estimated demand for 2021 and 2022 at 9,789 acre-feet per year.⁹ Water use in the Cal-Am system has been even further reduced since these forecasts were developed and total production was just 9,269 AF for the water year ending Sept. 30, 2020, excluding Permit 21330 diversions.¹⁰ This is the lowest level of water demand for Cal-Am over the 20 years of records

⁶ California Water Code Sections 10631 (effective Jan. 1, 2020) and 10635 (effective Jan. 1, 2019).

⁷ Non-revenue water is the industry-standard replacement term for the antiquated “unaccounted for” water category. Non-revenue water is the technical term used to describe water that produces no revenue to the supplier, and it includes physical losses from water system as well as authorized consumption such as hydrant flushing.

⁸The AMBAG forecast likely over-estimates Cal-Am’s future growth because it includes new population in portions of the cities of Monterey, Seaside, and Del Rey Oaks within the Fort Ord Buildout that will be served water by the Marina Coast Water District, not by Cal-Am.

⁹ California-American Water Company. 2019. (U-210-W)

¹⁰ Cal-Am. 2020. State Water Resources Control Board Order WR 2016-0016 / WR 2009-0060, 4th Quarterly Report for the 2019-2020 Water Year Addressing Operations for the Period of July 1, 2020 to September 30, 2020.

that WaterDM has reviewed, further emphasizing the conservative nature of the WaterDM forecasts.

- The “Current gpcd”¹¹ forecast assumed the current rate of daily per person water usage continues into the future, without any increases in efficiency or conservation reductions.
- The “Continued efficiency” forecast includes the impacts of ongoing efficiency improvements by applying an indoor reduction factor.

For this third supplemental report, a modified demand-managed version of the “Continued efficiency” forecast was used to evaluate the impact of a five-year continuous drought. The revised “Demand managed forecast” includes a 5% reduction in total demand during year 1 of the drought and a 10% total reduction from expected demand during years 2 – 5 of the drought.¹² These reductions are expected to be accomplished through the implementation of outdoor usage restrictions, drought surcharges, education, outreach, leak reduction, and landscape water management using water budgets. Significantly, the “Demand managed forecast” includes forecast population growth from the Associated Monterey Bay Area Governments (AMBAG) 2018 forecast of future population growth and the additional demand anticipated from this growth, along with demand managed reductions.

In my professional judgement, the “Demand managed forecast” forecast represents a reasonable drought response scenario for Cal-Am with comparably modest demand reductions and the inclusion of ongoing population growth. Thus the “Demand managed” forecast used in this report to evaluate the adequacy of water supply through a five-year continuous drought should be considered a conservative forecast.

Water Supply Under Drought Conditions

Each of Cal-Am’s water sources was evaluated to determine what level of production can reasonably be expected during a continuous five-year drought.

Water Supply for the Monterey Main System

Cal-Am delivers water to its Monterey Main system from a diverse collection of water sources. Cal-Am has historically relied heavily on diversions from the Carmel River and Seaside Basin native groundwater to provide water to the Monterey Main system. In the future withdrawals from both sources must be reduced – even in the event of a five-year continuous drought. In this analysis it was assumed that the Pure Water Monterey Expansion begins delivering water

¹¹ gpcd = gallons per capita per day

¹² Given the remarkably low level of water usage report by Cal-Am in the SWRCB 4th Quarterly Report, additional demand reductions required during the five-year drought will likely be smaller and less severe than shown in this analysis.

to Cal-Am in year 2 of the drought, and Cal-Am purchases a maximum of 1,600 AF from the expansion project starting in year 3.

Table 1 presents the water supply sources available to Cal-Am for the coming years under normal conditions and under drought conditions. Table 2 shows projected supply in the Monterey Main system (2020-2030) under a five-year drought occurring 2022-2026, including the “Demand managed forecast” prepared by WaterDM. All of the supply sources shown in Table 2 are documented in Table 1.

Table 3 shows Cal-Am’s water storage reserves (2020-2030) under a five-year drought occurring 2022-2026. In this table it is assumed that additional withdrawals from storage come first from Pure Water Monterey and Other Carryover.

Table 4 incorporates the information and data from the previous tables to conform with California DWR’s Urban Water Management Plan Drought Risk Assessment Table provided to address Water Code Section 10635(b).

Table 1: Cal-Am Monterey Main System water supply sources under normal and drought conditions, 2022 - 2030

Water Source	Normal AFY	Drought AFY	Notes	Regulator	Data Source
Carmel River – Cease and Desist Order	3,376 AFY	3,376 AFY	2,179 AFY from License 11866; 1,137 AFY of pre-1914 appropriative rights; and 60 AFY of riparian rights.	SWRCB Order 2016-0016	Cal-Am reports to the SWRCB
Carmel River – Permit 21330	300 AFY	0 AFY	Only available Dec. – May. Assumed to be unavailable during the five-year drought.	SWRCB	Cal-Am reports to the SWRCB
Seaside Basin Native Groundwater	774 AFY	774 AFY	Reflects 700 AFY payback for Cal-Am’s over-pumping of the Seaside Basin.	Seaside Basin Watermaster	Watermaster’s annual reports.
ASR Recovered Water	1,300 AFY	0 AFY	Based on long-term historical precipitation and streamflow, ASR system may be capable of recovering an average of 1,920 AFY per year. During the five-year continuous drought this water source is assumed to be unavailable to Cal-Am. But already stored ASR water would be available, if needed.	SWRCB Water Rights Permits 20808A & C	Cal-Am reports to the SWRCB
Sand City Desalination Plant	150 AFY	150 AFY	300 AFY capacity. Has averaged 209 AFY over life of plant. During a drought it is possible this supply could produce more, but it was restricted in this analysis.	SWRCB Order 2016-0016 & Division of Drinking Water	Cal-Am reports to the SWRCB
Pure Water Monterey	3,500 AFY	3,500 AFY	Starting in 2021, capable of delivering the full volume contracted to Cal-Am through the five-year drought.	Division of Drinking Water & Seaside Basin Watermaster	TBD
Pure Water Monterey Expansion	1,600 AFY	1,600 AFY	Capable of delivering 2,250. It is anticipated Cal-Am will only need to purchase up to 1,600 AFY. This volume will be available through the five-year drought.	Division of Drinking Water & Seaside Basin Watermaster	TBD
Additional Withdrawal from storage (excluding ASR recovery)	As needed		Variable volume of additional recoveries from storage taken as required.	Seaside Basin Watermaster	Various
TOTAL	11,000 AFY	9,400 AFY			

Table 2: Cal-Am water supply (2020 – 2030) under a five-year drought occurring 2022-2026

Cal-Am Water Supply (AFY)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	
Carmel River	8,310	8,310	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	
Missed milestone	(250)	(1,250)	DROUGHT 2022 - 2026									
ASR Injection Water	(600)	(600)										
Sand City Deduction	(102)	(56)										
Pure Water Monterey	(100)	(200)										
Carmel River Carryover Credit	750	750										
300 AFY Carmel River			-	-	-	-	-	300	300	300	300	
Carmel River Total (net)	8,258	7,254	3,376	3,376	3,376	3,376	3,376	3,676	3,676	3,676	3,676	
Seaside Basin	1,882	1,734	1,474	774	774	774	774	774	774	774	774	
ASR recovery	753	750	-	-	-	-	-	1,300	1,300	1,300	1,300	
Sand City Desal	196	150	150	150	150	150	150	150	150	150	150	
Pure Water Monterey	100	200	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	
Total Existing Supplies from Production	11,189	10,088	8,500	7,800	7,800	7,800	7,800	9,400	9,400	9,400	9,400	
Pure Water Monterey Expansion	-	-	-	500	1,600	1,600	1,600	1,600	1,600	1,600	1,600	
Additional Withdrawal from Storage	-	-	1,007	707	-	-	-	-	-	-	-	
Total	11,189	10,088	9,507	9,007	9,400	9,400	9,400	11,000	11,000	11,000	11,000	
Demand managed forecast	9,985	10,008	9,507	9,007	9,027	9,048	9,068	10,142	10,164	10,185	10,207	
<i>Excess/Shortage</i>	<i>1,204</i>	<i>80</i>	<i>0</i>	<i>0</i>	<i>373</i>	<i>352</i>	<i>332</i>	<i>858</i>	<i>836</i>	<i>815</i>	<i>793</i>	

Table 3: Cal-Am water storage reserves (2020 – 2030) under a five-year drought occurring 2022-2026

Groundwater Storage (AF)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
ASR Carryover	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171	1,171
PWM Operating Reserve	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ARWRA Drought Reserve	-	200	200	200	200	200	200	400	600	800	1,000
PWM Expansion Reserve	-	-	-	-	373	725	1,057	1,915	2,752	3,567	4,360
PWM & Other Carryover	650	5,154	4,227	3,520	3,520	3,520	3,520	3,520	3,520	3,520	3,520
Total End of Year Storage (AF)	2,821	7,525	6,598	5,891	6,264	6,616	6,948	8,006	9,043	10,058	11,051

Table 4: Cal-Am Urban Water Management Plan Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b)¹³

	2022	2023	2024	2025	2026
Gross Water Use (AFY)	10,030	10,053	10,075	10,098	10,120
Total Existing Supplies (AFY)	8,500	7,800	7,800	7,800	7,800
Surplus/Shortfall w/o WSCP Action (AFY)	-1,530	-2,253	-2,275	-2,298	-2,320
WSCP - supply augmentation benefit (AFY)	1,007	1,207	1,600	1,600	1,600
WSCP - use reduction savings benefit (AFY)	523	1,046	1,048	1,050	1,052
Revised Surplus/(shortfall) (AFY)	0	0	373	352	332
Resulting % Use Reduction from WSCP action	5.2%	10.4%	10.4%	10.4%	10.4%
Planned WSCP Actions (use reduction and supply augmentation)	Drought surcharge, watering restrictions, additional withdrawal from Seaside Basin storage	Drought surcharge, watering restrictions, water budgets, additional withdrawal from Seaside Basin storage, PWM Expansion	Drought surcharge, watering restrictions, water budgets, PWM Expansion	Drought surcharge, watering restrictions, water budgets, PWM Expansion	Drought surcharge, watering restrictions, water budgets, PWM Expansion

Footnotes:

Gross Water Use = Demand forecast without any demand management = WaterDM “Continued efficiency forecast”

WSCP = Water Shortage Contingency Plan (specified by Water Code 10632)

A re-creation of DWR’s Table 7-5, Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) is shown in Appendix B

¹³ California Department of Water Resources. 2020. Urban Water Management Plan Guidebook 2020 (Aug. 2020 draft). Table 7.5

Each source of water and the volume of available reliable supply during a normal year and during the hypothetical continuous five-year drought is described in detail in the sections below.

Carmel River

Diversions from the Carmel River, Cal-Am's primary water source, must be reduced in accordance with a cease-and-desist order from the State Water Resources Control Board. The original order, issued in 1995, determined that Cal-Am was extracting over 14,000 acre-feet per year from the river when it had a legal right to only 3,376 acre-feet. The State Water Resources Control Board determined that these illegal diversions were adversely affecting the river's population of federally threatened Central Coast steelhead and riparian habitat. The Board ordered Cal-Am to develop or purchase alternative water supplies so it could end its illegal diversions.

Table 2 shows Carmel River production reducing to the mandated 3,376 AFY in 2022. This is the volume to which Cal-Am has a legal right and is comprised of 2,179 AFY from License 11866; 1,137 AFY of pre-1914 appropriative rights; and 60 AFY of riparian rights.¹⁴

Under the five-year drought condition starting in 2022, it is assumed Cal-Am will have access to its full 3,376 AFY legal entitlement.

Table 2 also shows an additional 300 AFY of Carmel River supply under normal conditions based on Permit 21330.¹⁵ Cal-Am's annual Progress Reports of Permittee to the State Water Resources Control Board show that it has withdrawn an average of 428 AFY per year from 2017-2019 under this permit. To model the impacts of a five-year continuous drought, it was assumed that Cal-Am will not divert any water under this permit from 2022 - 2026, as shown in Table 2.

Also shown are expected deductions to its annual Carmel River Effective Diversion Limit that will be assessed to Cal-Am in 2020 and 2021 pursuant to the Cease and Desist Order.

Through 2021 Cal-Am is permitted to carry over Carmel River water it does not withdraw under the Effective Diversion Limit as a credit and to draw on this credit as the maximum amount of 750 AFY per year. Usage of water in this carryover credit account is also reflected in Table 2. As of September 30, 2020 Cal-Am's Cumulative Carryover credit for Future Years was 6,001 AF.¹⁶ If

¹⁴ Monterey Peninsula Water Management District. 2020. (MPWMD Report) Supply and Demand for Water on the Monterey Peninsula prepared by David Stoldt. (3-13-2020, 12-3-2019, and 9-16-2019) (p.3)

¹⁵ "In 2013, Cal-Am received Permit 21330 from the State Water Board for 1,488 AFA from the Carmel River. However, the permit is seasonally limited to December 1 through May 31 each year and subject to instream flow requirements." MPWMD Report (p.3)

¹⁶ Cal-Am. 2020. State Water Resources Control Board Order WR 2016-0016 / WR 2009-0060, 4th Quarterly Report for the 2019-2020 Water Year Addressing Operations for the Period of July 1, 2020 to September 30, 2020. (Table Five (c)).

this Carryover Credit were continued after 2021, it would provide a valuable source of supply until credits are exhausted.

Seaside Groundwater Basin – Native Groundwater

Along with the Carmel River, the diversions of native groundwater from the Seaside Groundwater Basin must also be reduced. The Seaside Basin was over pumped by Cal-Am prior to the 2006 Seaside Groundwater Basin adjudication which imposed triennial reductions in operating yield until the basin’s “Natural Safe Yield” is achieved. For Cal-Am, the last reduction will occur on October 1, 2021 and Cal-Am will have rights to 1,474 acre-feet per year. However, Cal-Am has over-drafted the Seaside Basin and must payback 700 AFY of its 1,474 AFY entitlement. The Seaside Basin Watermaster could suspend all or part of the 700 AFY payback during an extended drought.

The Seaside Basin Watermaster states Cal-Am’s “payback amount is currently estimated to be 18,000 acre-feet”, thus 25.7 years of 700 AFY per year re-payments would complete the payback.¹⁷ Cal-Am’s agreement with the Watermaster requires payback to commence once the desalination project comes online. For the purposes of this analysis it was assumed that this obligation will only be triggered once Cal-Am obtains a permanent additional supply of water, in this case the Pure Water Monterey Expansion. In this analysis, Cal-Am’s withdrawals are reduced to 774 AFY starting in 2023 when Pure Water Monterey Expansion water recovery begins.

Table 2 shows 774 AFY of supply available from the Seaside Basin from 2023 – 2030. This reflects commencement of payback in 2023 when water from the Pure Water Expansion becomes available.¹⁸

The Seaside Basin Watermaster’s 2019 report to the Court overseeing the groundwater adjudication states that the total usable storage space in the entire Seaside Groundwater Basin is 52,030 AF. The report also describes the current allocation of that usable storage space among the Seaside Basin pumpers with Cal-Am allocated 28,733 acre-feet.¹⁹ This allocation allows Cal-Am to bank water as described in the Seaside Basin Storage Reserve section below. This reserve will be an available supply “cushion” for Cal-Am to meet demand without relying on the Carmel River.

¹⁷ Seaside Basin Watermaster Jan. 8, 2020 Letter to Rachel Gaudoin. Subject: Draft Supplemental Environmental Impact Report for the Proposed Modifications to the Pure Water Monterey Groundwater Replenishment Project (Draft Supplemental EIR)

¹⁸ From 2023 – 2030, payback water will contribute 5,600 AF to the Seaside Basin. That 5,600 AF is not included in any table in this report; however, the contribution of payback water to the sustainability of the Seaside Basin is significant. Table 3 states that the Total End of Year Storage for 2030 will be 11,051 AF. With the additional 5,600 AF of payback water, the actual 2030 end of year storage will be 16,651 AF.

¹⁹ Seaside Basin Watermaster Annual Report – 2019, December 5, 2019

Aquifer Storage and Recovery

Cal-Am participates in an aquifer storage and recovery (ASR) project that allows for the capture of excess Carmel River flows through wells along the river from December through May. This river water is then transferred through existing conveyance facilities and injected into the Seaside Groundwater Basin for later extraction. This project operates with four ASR well sites capable of both injection and extraction. Ownership and operation of this source water project has various components split between Cal-Am and the Monterey Peninsula Water Management District.²⁰

There are two water rights that support the ASR system: Permit 20808A which allows maximum diversion of 2,426 AFY and Permit 20808C which allows up to 2,900 AFY for a total potential maximum annual diversion of 5,326 AFY.²¹ But in reality Cal-Am will only be able to divert, inject, and store the maximum permitted volume in wet years.

During the five-year continuous drought analyzed in this report, WaterDM conservatively assumed that Cal-Am will not be able to divert and inject any ASR water. Table 2 assumes 0 AFY of ASR diversion and injection per year for 2022 – 2026 during the continuous five-year drought.

Sand City Desalination Plant

Cal-Am has an operating agreement for the Sand City Desalination Plant, a small facility designed to produce 300 acre-feet of water per year. Due to discharge permit requirements, to date the Sand City plant has never produced the full 300 AFY and the maximum that it has ever produced was 276 AFY in 2011. Over the life of the plant it has averaged 209 AFY of production per year but it has only averaged 188 AFY per year of production from 2016 – 2019.²² Table 1 and Table 2 conservatively include 150 AFY per year of production well below the long-term average of 209 AFY per year.

It is assumed this facility will not be impacted and can continue to produce 150 AFY during the five-year continuous drought.

Pure Water Monterey

Monterey One Water in partnership with the Monterey Peninsula Water Management District developed the Pure Water Monterey Groundwater Replenishment Project to create a reliable source of water supply to replace illegally diverted Carmel River withdrawals and permanently supplement existing water supply sources for the Monterey Peninsula. The Pure Water

²⁰ California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Christopher Cook (p.7)

²¹ MPWMD Report (p.3)

²² MPWMD Report

Monterey project also makes available advanced treated water to the Marina Coast Water District.

The Pure Water Monterey Project is designed to produce 3,500 acre-feet per year of purified recycled water to compose a portion of Cal-Am's water supply and to assist in complying with the State Water Resources Control Board orders. The source waters for Cal-Am's portion of the Pure Water Monterey Project are agricultural produce wash water and drainage flows from the Blanco Drain and Reclamation Ditch. Data and analysis presented by Monterey One Water in August 2020 shows that concerns regarding the volume and reliability of the source water supply are inaccurate and unsubstantiated.²³ Therefore this analysis projects the Pure Water Monterey Project will reliably deliver Cal-Am 3,500 AFY during the continuous five-year drought.

The Pure Water Monterey Project includes a 4 million gallon per day capacity water purification facility for treatment and production of purified recycled water that is conveyed and stored in the Basin using injection wells. Project conveyance facilities include ten miles of pipeline from the purification facility to injection wells in the Seaside Groundwater Basin. This pipeline is owned and operated by the Marina Coast Water District.

Once injected, the purified recycled water augments existing groundwater supplies and can provide 3,500 acre-feet per year of water to Cal-Am for extraction and direct use. Pure Water Monterey is operational in 2020 and Table 2 includes 3,500 AFY per year of recovery from the Pure Water Monterey project starting in 2022. Table 2 also shows Cal-Am will recover 3,500 AFY from 2022-2026 during the continuous drought.

Prior to 2022, under the cease and desist order, Cal-Am is penalized 1 AFY of its Carmel River effective diversion limit for every 1 AFY of Pure Water Monterey recovered for use. So during 2020 and 2021, it would be prudent for Cal-Am to continue using available Carmel River water while banking excess Pure Water Monterey water in the Seaside Basin, and that is what is assumed in Table 2.

Seaside Basin Groundwater Storage Reserve

Cal-Am is allocated 28,733 AF of total storage in the Seaside Groundwater Basin.²⁴ Cal-Am's 4th quarterly report to the State Water Board for the period ending September 30, 2020 shows the end of month ASR Storage Balance to be 1,171 AF. Leading up to the cease and desist order deadline at the end of 2021, Cal-Am should continue diversions from the Carmel River while storing and banking excess Pure Water Monterey water in the Seaside Basin as carryover in addition to the 1,000 AF drought reserve and the operating reserve discussed below.

²³ Monterey One Water. Aug. 20, 2020. Letter from Paul A. Sciuto, General Manager, to Mr. Tom Luster, California Coastal Commission.

²⁴ Seaside Basin Watermaster Annual Report – 2019, December 5, 2019

The analysis of Cal-Am’s potential storage build up in the Seaside Basin, including the impacts of drawing on this reserve during a hypothetical five year-drought, is presented in Table 3.

Under the Water Purchase Agreement, the first 1,000 AF of water produced in the Pure Water Monterey facility has been injected and stored as an operating reserve in the Seaside Basin. The operating reserve is owned by the Monterey Peninsula Water Management District and is available to ensure Cal-Am can recover 3,500 AFY.

After injection, water in the operating reserve and drought reserve are owned by the Monterey Peninsula Water Management District and maintained for the benefit of Cal-Am. Cal-Am owns the ASR, Pure Water Monterey and Other Carryover water, and Pure Water Monterey Expansion Reserves. This banked storage provides a valuable and necessary buffer for Cal-Am to use if drought or higher demand than forecasted should occur.

Supply and Storage Reserves During a Continuous Five-Year Drought

Figure 1 shows Cal-Am’ available water supply and storage reserves from 2020 – 2030 including a five-year continuous drought starting in 2022. The combination of a modest component of demand management²⁵ and the addition of 1,600 AFY from the Pure Water Monterey Expansion project enable Cal-Am to manage through the five-year drought while maintaining at least 5,800 AF in storage reserves.

²⁵ WaterDM’s analysis showed that Cal-Am can manage through the five-year continuous drought without any demand management by depleting storage reserves to below 1,000 AF in the fifth drought year. An extended drought situation without any demand management is entirely unrealistic based on California history of mandatory drought restrictions and DWR’s water shortage contingency planning requirements which include anticipated demand reductions as part of the calculation.

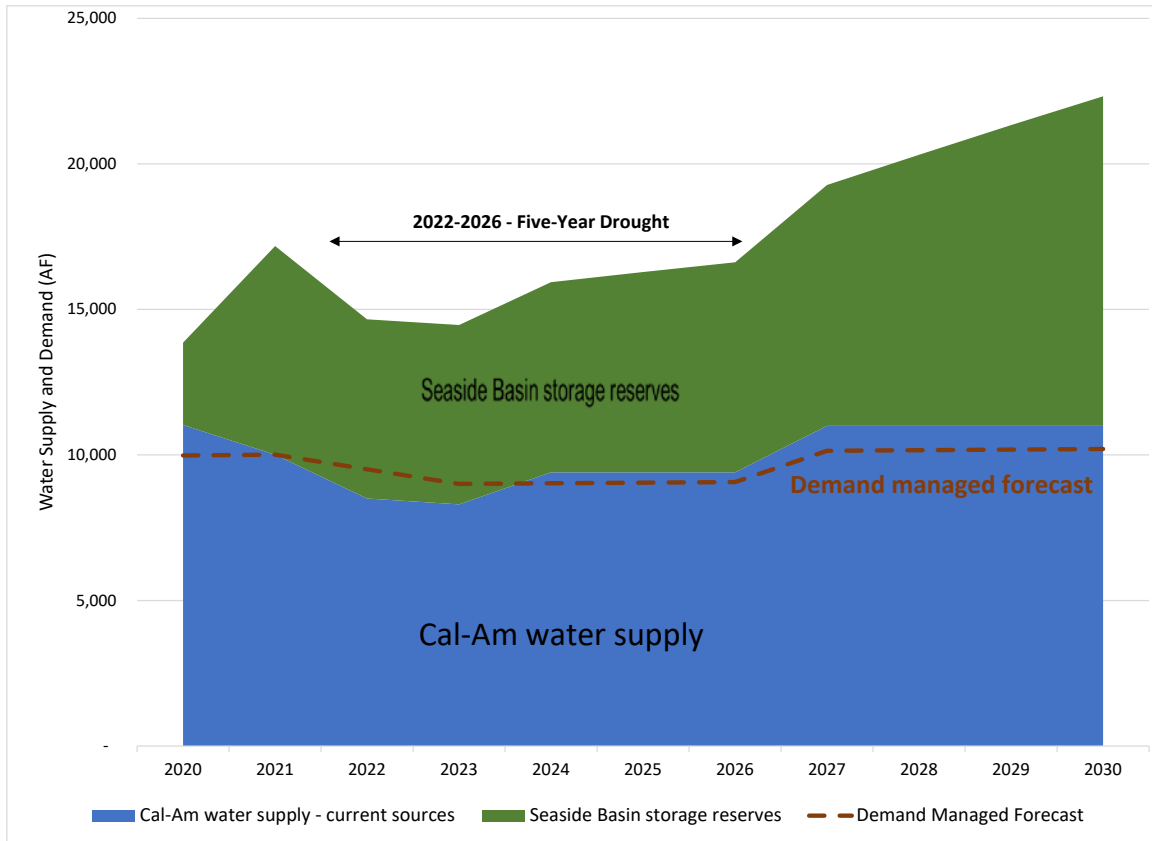


Figure 1: Cal-Am water supply and storage reserves (2020 – 2030) under a five-year drought occurring 2022-2026

Figure 2 shows Cal-Am’s individual supply sources and combined storage reserves from 2020 – 2030 including a five-year continuous drought starting in 2022. The small component of storage reserves that are used can be seen in 2022 and 2023, replaced by the Pure Water Monterey Expansion from 2023 on.

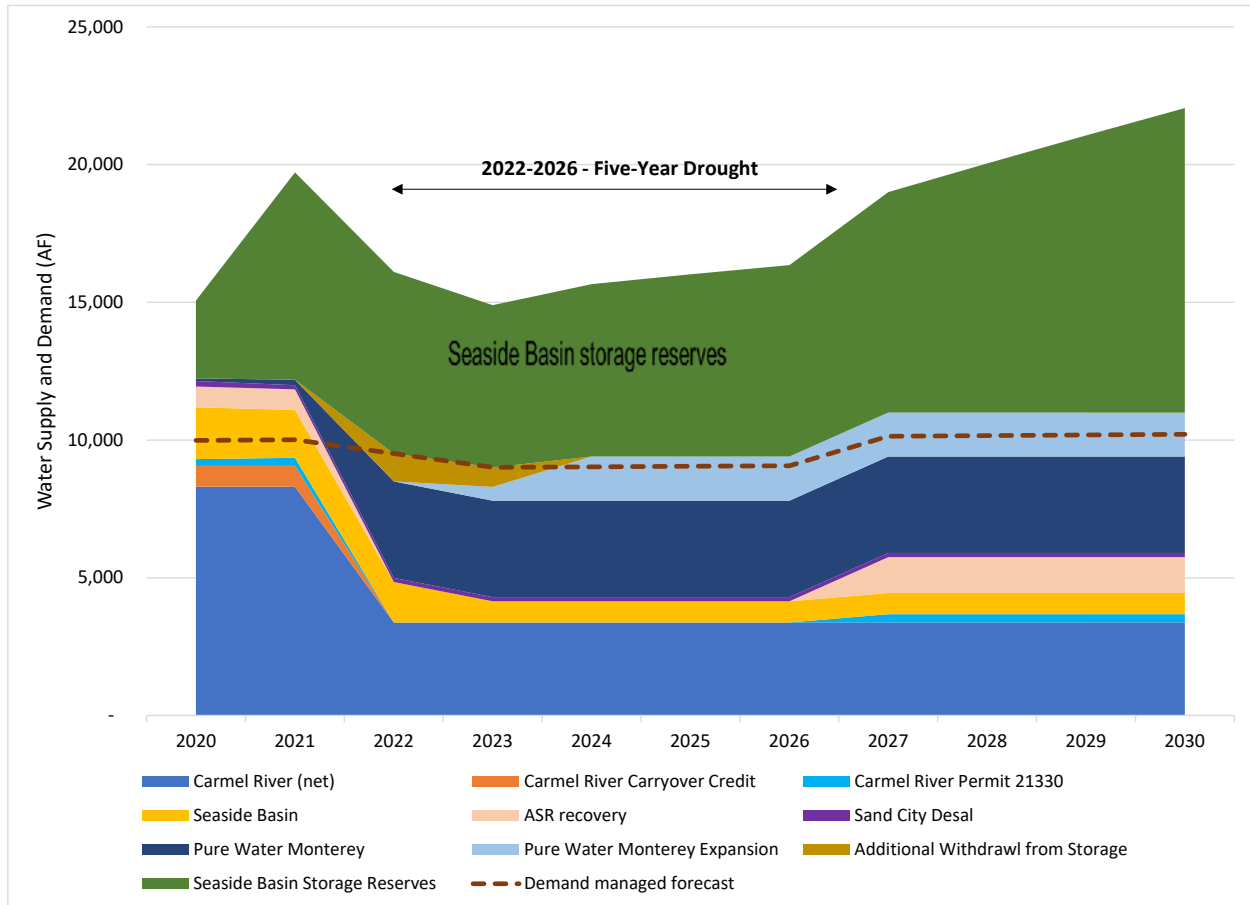


Figure 2: Cal-Am water supply by source and storage reserves (2020 – 2030) under a five-year drought occurring 2022-2026

Figure 3 shows Cal-Am’s combined water sources and individual storage reserves from 2020 – 2030 including a five-year continuous drought starting in 2022. This analysis shows Cal-Am utilizing storage reserves in 2022 and 2023 during the drought but building upon reserves during 2024 – 2026 once the Pure Water Monterey Expansion project becomes available.

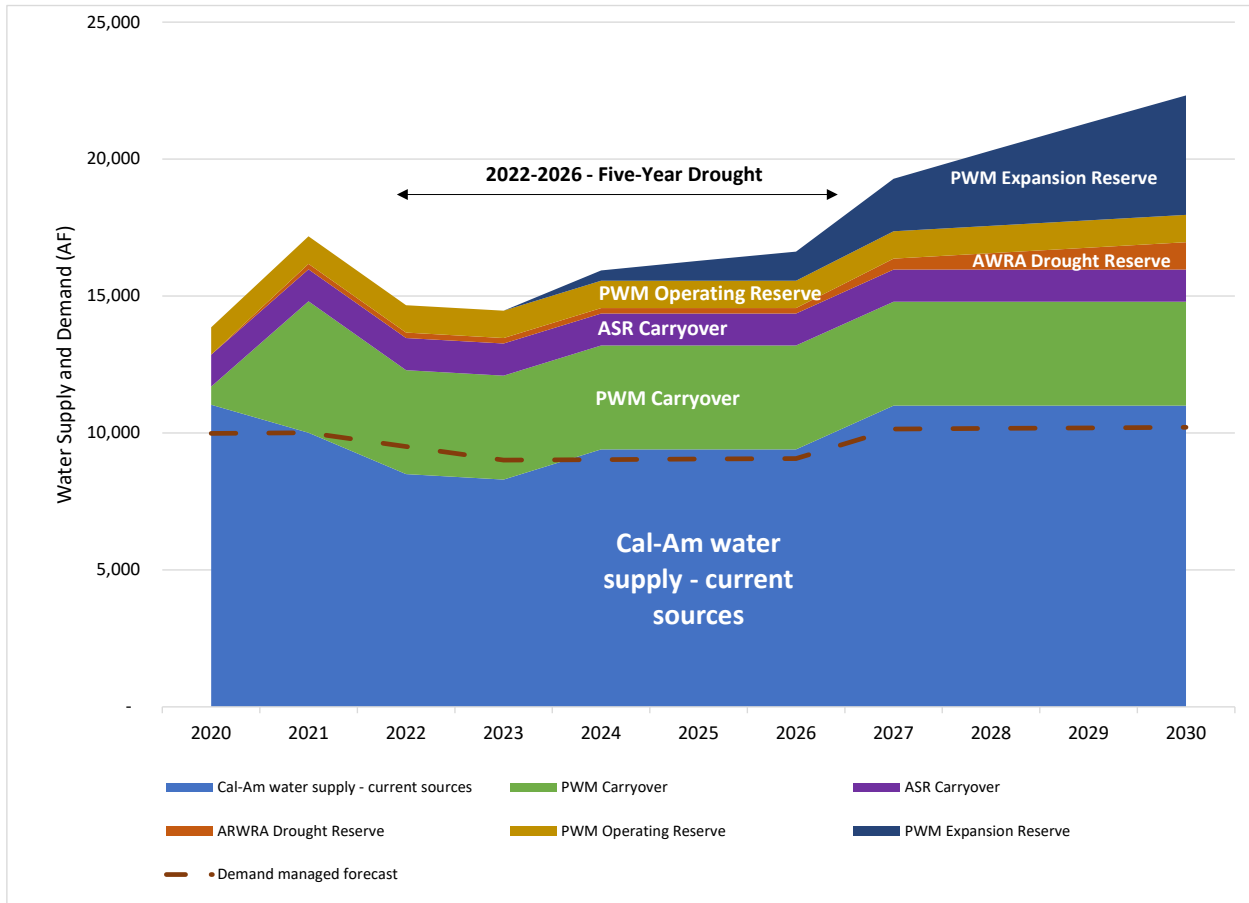


Figure 3: Cal-Am Seaside Basin storage reserves by source (2020 – 2030) under a five-year drought occurring 2022-2026

SUMMARY

As a result of my review of the items listed in Appendix A and other related and relevant documents and reports, my own independent analysis, and my expertise in municipal and industrial water use, water management, and engineering, I offer the following analysis and opinions regarding Cal-Am's ability to manage through a five-year drought:

With the addition of the Pure Water Monterey Expansion, Cal-Am has sufficient supplies in the event of a five-year continuous drought, while still complying with the cease and desist order by eliminating all illegal diversions from the Carmel River by December 31, 2021.

Sections 10631 and 10635 of the State of California Water Code now require every urban water supplier in the state to provide an assessment of water supply for "a drought lasting five consecutive water years."²⁶ The California Department of Water Resources (DWR) Urban Water Management Plan Guidebook 2020 includes Table 7-5, Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b), which provides guidance on how urban providers are to comply with the five-year drought planning requirement.

Building on the analyses prepared in WaterDM's expert report²⁷ and supplements^{28,29}, a five-year drought risk assessment was prepared for the Cal-Am Monterey Main system in accordance with the State of California's planning requirements. This risk assessment includes a five-year continuous drought, mandated reduction of Cal-Am's illegal water withdrawals from the Carmel River in accordance with provisions of a cease-and-desist order from the State Water Resources Control Board, and fulfillment of Cal-Am's obligation to the Seaside Basin to leave 700 acre-feet per year (AFY) as payback for over-drafting the Seaside Basin.

During a continuous five-year drought, the most significant potential impact to Cal-Am's current supply portfolio would be the inability to divert any water to its aquifer storage and recovery (ASR) project that usually captures excess Carmel River winter flows. The arrival of water from the Pure Water Monterey Expansion project starting in the second year of the drought, and an annual 5% - 10% reduction in demand through mandatory drought restrictions, enables Cal-Am to manage through a five-year continuous drought while maintaining at least 5,800 acre-feet (AF) of underground storage reserve.

²⁶ California Water Code Sections 10631 (effective Jan. 1, 2020) and 10635 (effective Jan. 1, 2019).

²⁷ WaterDM. April 21, 2020. Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

²⁸ WaterDM. July 1, 2020. Supplemental Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

²⁹ WaterDM. September 11, 2020. Second Supplemental Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

Appendix A – Materials Considered³⁰

California-American Water Company. 2020. State Water Resources Control Board Order WR 2016-0016 / WR 2009-0060, 4th Quarterly Report for the 2019-2020 Water Year Addressing Operations for the Period of July 1, 2020 to September 30, 2020.

California-American Water Company. 2019. (U-210-W) Update to General Rate Case Application, A.19-07-004. Direct Testimony of Christopher Cook

California Department of Water Resources. 2020. Urban Water Management Plan Guidebook 2020 (Aug. 2020 draft).

Monterey One Water. Aug. 20, 2020. Letter from Paul A. Sciuto, General Manager, to Mr. Tom Luster, California Coastal Commission.

Monterey Peninsula Water Management District. 2020. Supply and Demand for Water on the Monterey Peninsula prepared by David Stoldt. (3-13-2020, 12-3-2019, and 9-16-2019)

Seaside Basin Watermaster Jan. 8, 2020 Letter to Rachel Gaudoin. Subject: Draft Supplemental Environmental Impact Report for the Proposed Modifications to the Pure Water Monterey Groundwater Replenishment Project (Draft Supplemental EIR)

Seaside Basin Watermaster Annual Report – 2019, December 5, 2019

State of California Water Code Sections 10631 (effective Jan. 1, 2020) and 10635 (effective Jan. 1, 2019).

WaterDM. April 21, 2020. Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

WaterDM. July 1, 2020. Supplemental Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

WaterDM. September 11, 2020. Second Supplemental Expert Report and Recommendations of Peter Mayer, P.E. Regarding Water Supply and Demand in the California American Water Company's Monterey Main System.

³⁰ Materials Considered also includes all materials cited in the footnotes of this Report.

Appendix B – Urban Water Management Plan Drought Risk Assessment Table

Data from the WaterDM analysis were entered into the table format provided by DWR for drought risk assessment. These same data are presented in Table 4.

Table 7-5. Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2022	Total
Gross Water Use	10030
Total Supplies	8500
Surplus/Shortfall w/o WSCP Action	-1530
Drought surcharge, irrigation restrictions, additional withdrawal from Seaside Basin storage	
WSCP - supply augmentation benefit	1007
WSCP - use reduction savings benefit	523
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	5.2%
2023	Total
Gross Water Use [Use Worksheet]	10053
Total Supplies [Supply Worksheet]	7800
Surplus/Shortfall w/o WSCP Action	-2253
Drought surcharge, irrigation restrictions, water budgets, PWM Expansion, additional withdrawals from Seaside Basin	
WSCP - supply augmentation benefit	1207
WSCP - use reduction savings benefit	1046
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	10.4%
2024	Total
Gross Water Use [Use Worksheet]	10075
Total Supplies [Supply Worksheet]	7800
Surplus/Shortfall w/o WSCP Action	-2275
Drought surcharge, irrigation restrictions, water budgets, PWM Expansion	
WSCP - supply augmentation benefit	1600
WSCP - use reduction savings benefit	1048
Revised Surplus/(shortfall)	373
Resulting % Use Reduction from WSCP action	10.4%

2024	Total
Gross Water Use [Use Worksheet]	10098
Total Supplies [Supply Worksheet]	7800
Surplus/Shortfall w/o WSCP Action	-2298
Drought surcharge, irrigation restrictions, water budgets, PWM Expansion	
WSCP - supply augmentation benefit	1600
WSCP - use reduction savings benefit	1050
Revised Surplus/(shortfall)	352
Resulting % Use Reduction from WSCP action	10.4%
2025	Total
Gross Water Use [Use Worksheet]	10120
Total Supplies [Supply Worksheet]	7800
Surplus/Shortfall w/o WSCP Action	-2320
Drought surcharge, irrigation restrictions, water budgets, PWM Expansion	
WSCP - supply augmentation benefit	1600
WSCP - use reduction savings benefit	1052
Revised Surplus/(shortfall)	332
Resulting % Use Reduction from WSCP action	10.4%