

# Supply and Demand for Water on the Monterey Peninsula

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FINAL

Adopted May 18, 2020

## Introduction

With the approval of the Monterey Peninsula Water Supply Project (MPWSP) in September 2018 and the continued environmental work on Pure Water Monterey (PWM) expansion as a back-up option, it is an opportune time to examine available supplies and their ability to meet current and long-term demand. This memorandum will also look at the changing nature of demand on the Monterey Peninsula, the underlying assumptions in the sizing of the water supply portfolio, and indicators of the market's ability to absorb new demand.

At its September 16, 2019 meeting, the District Board accepted a report titled *"Supply and Demand for Water on the Monterey Peninsula"*, which was Exhibit 9-A of the Board packet. The report was reviewed by members of the public, local organizations, and state agencies. While publicly vetted, only three sets of comments were received: (a) California American Water provided a comment letter October 15, 2019, and (b) The Coalition of Peninsula Businesses provided letters September 15, 2019 and September 24, 2019. All three comment letters argued that the findings in the report contradict those of the California Public Utilities Commission, but the letters did not provide any substantive alternate assumptions or facts. The District's General Manager has encouraged the parties to provide their own forecast of growth and/or market absorption of water demand, but they have failed to do so.

At the November 14, 2019 Coastal Commission hearing former Pacific Grove mayor Bill Kampe did raise two substantive issues regarding the report: (a) pre-Cease and Desist Order (CDO) market absorption of water demand may have been constrained in some jurisdictions due to a lack of water allocation, and (b) new statewide focus on housing will require water.

Additionally, subsequent to the release of the initial report the 2019 water year was completed, providing an additional data point on current customer demand. The report was revised December 3, 2019 to address three items: (i) What is average current demand with the additional water year in the data? (ii) What water will be required to meet future housing needs? And (iii) What might be the market absorption of water based on an objective third-party growth forecast – the Association of Monterey Bay Area Governments (AMBAG) 2018 Growth Forecast? The revisions were presented to the District's Water Demand Committee December 17, 2019 and a revised report was distributed to the Peninsula's six city managers in January.

On January 22, 2020 Hazen & Sawyer, a consultant to Cal-Am, issued an analysis of the District’s report, to which the District responded on March 6, 2020.

This FINAL version of the supply and demand report responds to comments made by the public, the city managers, Hazen & Sawyer, and incorporates an additional growth forecast.

## Supply

Available sources of supply are shown in Table 1 below and are described in the discussion that follows. Despite the California Supreme Court’s decision to not hear the two petitions for writ of review, there remains the risk of additional legal challenges and not all permits have been issued for California American Water’s (Cal-Am) MPWSP desalination plant. For these reasons, supply has been shown with both desalination and with PWM expansion as a back-up.

Table 1  
Monterey Peninsula Available Supply  
(Acre-Feet Annually)

Supply Source	w/ Desalination	w/ PWM Expansion
MPWSP Desalination Plant	6,252	0
Pure Water Monterey	3,500	3,500
PWM Expansion	0	2,250
Carmel River	3,376	3,376
Seaside Basin	774	774
Aquifer Storage & Recovery (ASR)	1,300	1,300
Sand City Desalination Plant	94	94
<b>Total Available Supply</b>	<b>15,296</b>	<b>11,294</b>

There also exists approximately 406 additional acre-feet of other available supplies as discussed below.

*Desalination:* The 6.4 million gallon per day (MGD) MPWSP desalination plant is expected to deliver 6,252 acre-feet annually (AFA).<sup>1</sup> It is likely to begin deliveries in late-2023, considering final permits in mid-2020, a 21-month construction period, and 6-month commissioning and start-up window.<sup>2</sup>

<sup>1</sup> CPUC Decision 18-09-017, September 13, 2018, page 70; Amended Application of California-American Water Company (U210W), Attachment H, March 14, 2016

<sup>2</sup> [www.watersupplyproject.org/schedule](http://www.watersupplyproject.org/schedule)

*Pure Water Monterey:* Monterey One Water's (M1W) project came online in February 2020 and should begin deliveries for customer service of 3,500 AFA to Cal-Am in mid-2020.

*Pure Water Monterey Expansion:* The expansion of Pure Water Monterey is expected to yield 2,250 AFA.<sup>3</sup> The source waters for the expansion are secure: In multiple presentations by the staff of Monterey One Water (M1W)<sup>4</sup> it has been shown that none of the source water for expansion of Pure Water Monterey is speculative, nor comes from Salinas valley sources for which M1W doesn't already have rights. In one example, source water for the expansion would come from ocean discharge from the Regional Treatment Plant (54%), the Reclamation Ditch (5%), Blanco Drain (10%), wastewater outside the prior M1W boundaries (30%), and summer water rights from the County Water Resource Agency (1%). This project could come online by late 2022.

*Carmel River:* Cal-Am has legal rights to 3,376 AFA from the Carmel River comprised of 2,179 AFA from License 11866, 1,137 AFA of pre-1914 appropriative rights, and 60 AFA of riparian rights. This does not include what is referred to as Table 13 rights, discussed under "*Other Available Supplies*" below.

*Seaside Basin:* The 2006 Seaside Groundwater Basin adjudication imposed triennial reductions in operating yield for Standard Producers such as Cal-Am until the basin's Natural Safe Yield is achieved. The last reduction will occur in 2021 and Cal-Am will have rights to 1,474 AFA. However, with the delivery of a long-term permanent water supply, the company would like to begin replacing its accumulated deficit of over-pumping through in-lieu recharge by leaving 700 AFA of its production right in the basin for 25 years. Hence, only 774 AFA is reflected as long-term supply available, although the additional 700 AF becomes available again in the future.

*Aquifer Storage & Recovery:* There are two water rights that support ASR. Permit 20808A allows maximum diversion of 2,426 AFA and Permit 20808C allows up to 2,900 AFA for a total of 5,326 AFA. However, these are maximums that may only be close to being achieved in the wettest of years. Based on long-term historical precipitation and streamflow data, ASR is designed to produce 1,920 AFA on average. The MPWSP assumes a lesser amount of 1,300 AFA to be conservative.

*Sand City Desalination Plant:* The Sand City plant was designed to produce a nominal 300 AFA, but has failed to achieve more than the 276 AF in 2011. Due to source water quality issues and discharge permit requirements the plant has averaged 188 AFA the past four years including water year 2019. The intakes will likely be augmented and production increased (see "*Other*

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<sup>3</sup> Notice of Preparation of a Supplemental Environmental Impact Report and Public Scoping Meeting Notice, page 4, May 15, 2019

<sup>4</sup> For example, November 12, 2019 M1W presentation to the Monterey County Farm Bureau and the Grower-Shipper Association and the September 30-2019 M1W board meeting

*Available Supplies*”, below.) Here only the 94 AFA of long-term production legally committed to offset Carmel River pumping is included.

*Other Available Supplies:* 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. As a result, actual production will vary by water year. Here, we have assumed 300 AFA on average. For the Sand City desalination plant the amount produced in excess of 94 AFA is available for general Cal-Am use and eventually to serve growth in Sand City. With new intakes, we have assumed average production of 200 AFA or 106 AFA of other available supply. There is also available unused capacity in the Seaside Basin which annually is reallocated to the Standard Producers such as Cal-Am as “Carryover Credit” under the adjudication decision. Such Carryover capacity has been on the order of 400 AFA recently. While not insignificant, Carryover Credit has not been included in the 406 AFA of “Other Available Supplies” stated earlier.

**Historical Water Demand for which MPWSP Desalination Plant is Sized**

The MPWSP was initially sized solely as a replacement supply<sup>5</sup> for current customer demand, but this has changed over time as described below. Consideration was also given to peak month and peak day. Additional demand was recognized to accommodate legal lots of record, a request by the hospitality industry to anticipate a return to occupancy rates similar to that which existed prior to the World Trade Center tragedy, and to shift the buildout of Pebble Beach off the river.<sup>6</sup> Table 2 below shows the demand assumptions originally used in sizing the MPWSP in the April 2012 application to the California Public Utilities Commission (CPUC). Each component is discussed below.

Table 2  
Water Demand Assumed in Sizing the MPWSP  
(Acre-Feet Annually)

Demand Component	Acre-Feet Annually
Average Current Customer Demand	13,290
Legal Lots of Record	1,181
Tourism Bounce-Back	500
Pebble Beach Buildout	325
<b>Total Water Demand</b>	<b>15,296</b>

<sup>5</sup> Direct Testimony of Richard C. Svindland, April 23, 2012, pages 4,5,7

<sup>6</sup> Supplemental Testimony of Richard C. Svindland, January 11, 2013, pages 4-5

*Average Current Customer Demand:* The Application of Cal-Am to the CPUC in April 2012 utilized 13,290 AFA which was the 5-year average demand for 2007-2011.<sup>7</sup> As stated earlier, this was to be replacement supply and the Application stated *“At this point future demands of the Monterey System have not been included in the sizing of the plant.”*<sup>8</sup> At that time, the 5-year average maximum month was 1,388 AF and the highest month was 1,532 AF.<sup>9</sup>

In a January 2013 CPUC filing, average demand was reiterated by Cal-Am to be 13,290 AFA but Cal-Am added that the plant would need to be increased larger by approximately 700 acre-feet per year for the in-lieu recharge of the Seaside Basin.<sup>6</sup> However, as can be seen in comparing Tables 1 and 2 above, supply equals demand at 15,296 AFA without changing the size of the plant from the initial Application.

In a 2016 update to the CPUC, Cal-Am recognized that average demand had declined in the intervening three years.<sup>10</sup> The 5-year average had declined to 10,966 AFA and the maximum month declined to 1,250 AF. At the time of the 2016 update, Cal-Am suggested that it should size the plant based on the backward-looking 10-year average demand and maximum month, instead of the 5-year average in the original Application, as well as several alternate assumptions about return of water to the Salinas Valley. They concluded *“we do not believe the size of the plants should be changed.”*<sup>11</sup>

In a September 2017 filing to the CPUC, Cal-Am acknowledged continuing declines in demand, but indicated that the plant sizing remained appropriate saying *“We anticipate demand to rebound over time after these new water supplies are available, the drought conditions continue to subside, the moratorium on new service connections is lifted, and strict conservation and water use restrictions are eased.”*<sup>12</sup> The company also for the first time introduced the use of future population and demand as a way to “normalize” the average demand used in sizing, a departure from the “replacement supply” basis under the initial Application in 2012.<sup>13</sup> This resulted in their estimate of average “current” system demand of 12,350 AFA. This amount, combined with the same lots of record, tourism bounce-back, and Pebble Beach buildout results in demand of 14,355 AFA – a reduction from the initial Application – but the company asserted that the plant need not be resized because this would allow it to run at 86% capacity, a more reasonable operating rate compared to the 95% posed in the original Application.

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<sup>7</sup> Direct Testimony of Richard C. Svindland, April 23, 2012, page 21

<sup>8</sup> Direct Testimony of Richard C. Svindland, April 23, 2012, page 36

<sup>9</sup> Direct Testimony of Richard C. Svindland, April 23, 2012, page 22

<sup>10</sup> Supplemental Testimony of Richard C. Svindland, April 14, 2016 (Errata), pages 7-11

<sup>11</sup> Supplemental Testimony of Richard C. Svindland, April 14, 2016 (Errata), page 9

<sup>12</sup> Direct Testimony of Ian Crooks Errata Version, September 27, 2017, page 10

<sup>13</sup> Direct Testimony of Ian Crooks Errata Version, September 27, 2017, pages 11-13

The CPUC, in its September 2018 Decision, agreed that “current” demand was 12,350 AFA, therefore the 6.4 MGD desalination plant is warranted. In its Decision D.18-09-017 the CPUC stated “we are convinced that 12,350 afy represents an appropriate estimate of annual demand to use in assessing the adequacy of Cal-Am’s water supply...”<sup>14</sup> It is important to understand that the CPUC did no original analysis, modeling, or projection of its own. It surveyed testimony provided by others and chose one to support its findings and recommendations. It should not be represented that that the CPUC developed demand numbers on its own.

*Legal Lots of Record:* The 2012 Application to the CPUC also included 1,181 AFA for Legal Lots of Record.<sup>15, 6</sup> Legal lots of record are defined as lots resulting from a subdivision of property in which the final map has been recorded in cities and towns, or in which the parcel map has been recorded in Parcels and Maps or Record of Surveys. Lots of record may include vacant lots on vacant parcels, vacant lots on improved parcels, and also included remodels on existing improved, non-vacant parcels. Ultimately, not all legal lots are buildable. While the District is the source of the 1,181 AFA estimated demands for the lots of record, the number was lifted from the 2009 Coastal Water Project environmental impact report.

*Tourism Bounce-Back:* The 500 AFA for economic recovery was originally proffered by the hospitality industry to handle a recovery of occupancy rates in the tourist industry in a post-World Trade Center tragedy setting.<sup>16, 6</sup> The industry felt that their most successful occupancy rates were in the three years prior to September 11, 2001 and felt 500 AFA would provide a buffer for a return to that level.

*Pebble Beach Buildout:* Ever since the State Water Board issued Order 95-10 and the Cease and Desist Order (CDO) it has recognized the Pebble Beach Company’s investment in the Reclamation Project and the Company’s right to serve its entitlements from the Carmel River. However, the State Water Board has stated a desire to have the Pebble Beach entitlements shifted away from the river and be satisfied by a new supply. At the time of the 2012 Application, the Pebble Beach company had approximately 325 AF of entitlements still available.

## **Water Demand Assumptions in 2020**

The original MPWSP desalination project plant sizing was done eight years ago in 2012. With the passage of time and the opportunity to perform deeper research, it is possible to revisit the assumptions about consumer demand for water in the current context.

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<sup>14</sup> CPUC D.18-09-017, page 49, lines 1-2.

<sup>15</sup> Direct Testimony of Richard C. Svindland, April 23, 2012, pages 22, 37.

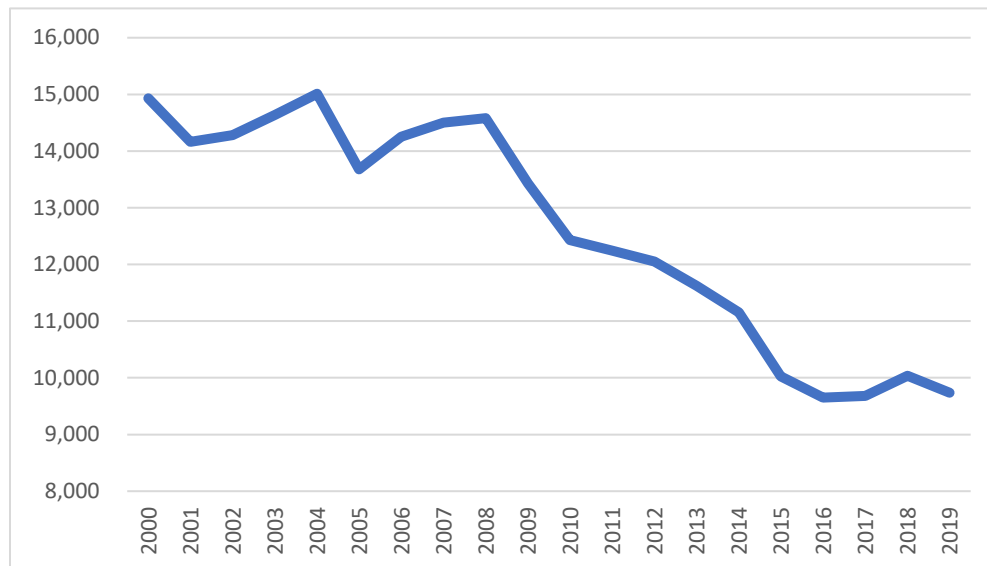
<sup>16</sup> Direct Testimony of Richard C. Svindland, April 23, 2012, page 37

It states in Decision 18-09-017 “The Commission similarly evaluated all of the evidence presented along with arguments of the parties and determines that Cal-Am’s future water demand will be approximately 14,000 afy”<sup>17</sup> However, no evidence was presented to determine if tourism “bounce-back” had already occurred, whether water efficiency gains would reduce the water demand of legal lots of record, or if the Pebble Beach Company could realistically build out its whole entitlement in a reasonable timeframe. Neither the CPUC, Cal-Am, nor Hazen & Sawyer evaluated the market absorption for new demand, which would answer the question: How soon will we get there? This MPWMD report simply takes a deeper look at the data behind these questions: How much will we need in the future? And How soon will we get there?

*Average Current Customer Demand:* The Cal-Am testimony submitted in support of the 12,350 AFA value used data that ended in 2016 and the company discounted the value of 2016 by incorrectly stating it was a drought year, which it was not on the Monterey Peninsula.<sup>18</sup> Hence, there are now three additional years of data (four if you do not discount 2016) since that used to develop the 12,350 AFA value.

Figure 1 below shows water production for customer service, a proxy for customer demand, for the past twenty-one-year period, updated for 2019 data. As can be seen, demand has been in decline, but somewhat leveled out over the past five years.

Figure 1  
Annual Water Production for Customer Service (Demand)  
Last 21 Years  
(Acre-Feet)



<sup>17</sup> CPUC Decision 18-09-017, page 68, line 1

<sup>18</sup> Direct Testimony of Ian Crooks, Errata Version, in A.12-04-019, September 27, 2107, page 10, at line 22.

Table 3 shows how the 10-, 5-, and 3-year average demand compares to the CPUC and Cal-Am’s most recent 12,350 AFA assumption.

Table 3  
 Alternate Average Current Customer Demand Assumptions  
 Updated for 2019 Water Year  
 (Acre-Feet)

Period	Amount	Difference to CPUC/Cal-Am #
CPUC/Cal-Am Assumption	12,350	
10-Year Average - Actual	10,863	1,487
5-Year Average - Actual	9,825	2,525
3-Year Average - Actual	9,817	2,533

Hence, the case could be made that the average customer demand assumption in the sizing of new water supply should be 9,817 to 10,863 AFA.

The trend is similar for peak month demand: 10-year maximum month through 2018 was 1,111 AF, the 5-year max was 966 AF, and the 3-year max was 950 AF. By comparison, the maximum month at the time the plant was first sized was 1,532 AF. The proposed desalination plant, in conjunction with the other production facilities can meet peak month/peak day requirements. Pure Water Monterey expansion adds 4 new extraction wells, two for production and two for redundancy. Preliminary analysis (see Appendix C) shows that peak month/peak day can also be met with Pure Water Monterey expansion.

Cal-Am itself has moved away from the 12,350 AFA number as a measure of current water demand in its current General Rate Case (GRC) application. As shown in the table below, Cal-Am now asserts in the GRC that its total water production for 2021 and 2022 from the Central Division will be 9,789 AFA,<sup>19</sup> which includes the Cal-Am Main System plus its satellites (generally thought to be 4-5% greater in total demand than the Cal-Am Main system.) This validates MPWMD’s estimate of current demand. The Cal-Am GRC filing can be seen in Appendix D attached.

In CPUC Decision 16-12-026, the Commission required Class A and B water utilities to propose improved forecast methodologies in their next general rate cases.<sup>20</sup> In the current GRC, Jeffrey Linam, Cal-Am’s Vice President of Rates and Regulatory, states in his testimony that Cal-Am *“believes that the testimony demonstrates improved forecasting methodologies that consider*

<sup>19</sup> California-American Water Company’s (U-210-W) Update to General Rate Case Application, A.19-07-004, October 14, 2019, Table 3.14 of Results of Operations Model

<sup>20</sup> Direct Testimony of Jeffrey T. Linam (Final Application), in A.19-07-004, July 1, 2019, page 108, at line 14



*the consumption trends during and following the drought that began in 2013”.*<sup>21</sup> Cal-Am “*hired David Mitchell of consulting firm MCubed to provide its sales forecast based on econometric models. The Company believes this is a significant improvement over the prior methods and use of historical averages...*”<sup>22</sup> This augments the testimony of Cal-Am expert witness Bahman Pourtaherian in the GRC who says David Mitchell’s company M-Cubed “*has expertise addressing sales forecasting and rate design issues for energy, municipal and investor owned water utilities across the State.*”<sup>23</sup>

Mr. Mitchell developed a highly complex econometric model for Cal-Am that in this GRC estimated the following (see Table 4) current demand (2021-2023) for the Cal-Am Main System (which is the system analyzed by MPWMD’s supply and demand analysis). His results, presented in the table below, also support MPWMD’s estimate of current demand.<sup>24</sup>

Table 4  
Cal-Am Estimates of Current Demand  
From Current 2019 GRC  
(AFA)

	2021	2022	2023
Central Division Forecast Sales Results of Operations Model in A.19-07-004 Table 3.14 (See also Exhibit 2) <sup>19</sup>	9,789	9,789	n/a
Expert Testimony of Cal-Am Witness David Mitchell Cal-Am Main System <sup>24</sup>	9,338	9,478	9,610

The forecasts were created when it was assumed the desalination plant would be online at the end of 2021.

*Legal Lots of Record:* The 1,181 number is derived from the October 2009 Coastal Water Project Final Environmental Impact Report and references a 2001 District analysis as the source. It was actually sourced from a Land Systems Group Phase II February 2002 interim draft report that used the number 1,181.438 AF. At that time, a calculation error was corrected and the report was subsequently updated in June 2002 and the number was revised to 1,210.964. However, the earlier number seems to have been used going forward. Both versions did not include vacant lots on improved parcels in the unincorporated County. Table 5 shows how the corrected number was calculated.

<sup>21</sup> Direct Testimony of Jeffrey T. Linam (Final Application), in A.19-07-004, July 1, 2019, page 102, at line 25

<sup>22</sup> Direct Testimony of Jeffrey T. Linam (Final Application), in A.19-07-004, July 1, 2019, page 105, at line 6

<sup>23</sup> Direct Testimony of Bahman Pourtaherian (Final Application), in A.19-07-004, July 1, 2019, page 9, at line 21

<sup>24</sup> Direct Testimony of David Mitchell (Final Application), in A.19-07-004, July 1, 2019, Attachment 2, page 32, final line converted to acre-feet from CCF

Table 5  
 Legal Lots of Record Estimates (2002)  
 Unincorporated County Not Included  
 (Acre-Feet)

Type of Parcel	Amount
Vacant Lots on Vacant Parcels	729.9
Vacant Lots on Improved Parcels	288.2
Anticipated Remodels (10 years)	192.8
<b>Total</b>	<b>1,210.9</b>

Table 6  
 Assumptions Driving the Legal Lots of Record Conclusions

Category	Units on Vacant Parcels	Units on Improved Parcels	Estimated Number of Remodels	Water Use Factor	Total Water Usage
Single Family Dwellings	688	152		0.286 AF	240.2
Multi-Family Dwellings	846	204		0.134 AF	140.7
Commercial/Industrial	556	288		0.755 AF	637.2
Residential Remodels			3765	0.029 AF	109.2
Commercial Remodels			513	0.163 AF	83.6
	<b>2,091</b>	<b>789</b>	<b>4,278</b>		<b>1,210.9</b>

However, since the study was done, the District’s conservation programs have resulted in reductions in the average water use factors which reduces the water needed for the same lots of record. For example, with single-family water use at 0.2 AFA, multifamily use at 0.12 AFA, and commercial customer connections averaging 0.66 AFA (2016 data), these changes alone would reduce the total above by 167.1 AF. Further, some of these lots may have been built upon, others determined unbuildable. Many of the remodels have likely occurred. General plans have been rewritten and housing elements recalculated. These factors taken together could result in another 150 AF reduction in the assumption.

Compared to the 1,890 units from the 2002 Land Systems Group study shown above, going forward, AMBAG’s Regional Housing Needs Allocation (RHNA) Plan: 2014-2023 showed 1,271 additional housing units expected in the 6 cities for a ten-year period. This is shown in Appendix B of this report. Assuming single-family water use at 0.2 AFA and multifamily use at 1.2 AFA, this equates to approximately 395-405 AFA over a 20-year period<sup>25</sup>. Most of AMBAG’s

<sup>25</sup> Appendix B of this report

projected growth occurs in Seaside and Monterey, which if slated for the former Fort Ord would not be served by Cal-Am. Unfortunately, it is not possible to accurately distinguish the Cal-Am served housing growth from the non-Cal-Am housing growth, but the 405 AFA likely overstates the Cal-Am growth. The AMBAG assumptions appear consistent with the Land Systems Group estimates. The RHNA is expected to be updated soon and the allocation could change. Instead of focus on a RHNA number, however, the water for housing can be thought of as captured within the population growth component of the third-party growth forecast discussed later in this report and in Appendix A, because houses don't use water – people do.

The case could be made that the legal lots of record demand assumption in the sizing of the MPWSP should be 864 to 1,014 AFA.

*Tourism Bounce-Back:* As stated earlier, the 500 AFA for economic recovery was originally suggested by the local hospitality industry to account for a recovery of occupancy rates in the tourist industry in a post-World Trade Center tragedy setting.<sup>6, 16</sup> Representatives of the Coalition of Peninsula Businesses indicated in 2017 testimony that the hospitality industry was hurt by the recent recession and that occupancy rates need to increase by 12 to 15 percent to re-attain the levels of decades ago.<sup>26</sup> It is true that the Salinas-Monterey market was one of five California markets, out of 22, to experience significant declines after the events of 2001, from 71.8% in 2000 to 63.0% in 2001.<sup>27</sup> It is also true that the decline persisted and was still down when the MPWSP desalination plant was sized, with occupancy rates of 62.8% in 2011-12 and 64.1% in 2012-13.<sup>28</sup> However, occupancy rates have since recovered with no notable increase in water demand. Hotel occupancy locally is back at approximately 72% and is estimated by Smith Travel Research to be higher for better quality properties on the Monterey Peninsula.<sup>29, 30</sup> The commercial sector water demand is shown below in Table 7 for the year prior to the World Trade Center tragedy, the year of the MPWSP plant sizing, and the most recent year. As can be seen, commercial demand, which is heavily influenced by the hospitality industry remains in decline, despite the already absorbed “bounce-back” in occupancy rates.

Table 7  
Commercial Sector Water Demand - Selected Years  
(Acre-Feet)

Year	Demand
2001	3,387
2012	2,770
2018	2,442

<sup>26</sup> Testimony of John Narigi (to CPUC), September 29, 2017, page 5

<sup>27</sup> HVS San Francisco, August 19, 2003

<sup>28</sup> Monterey County Convention and Visitors Bureau Annual Report 2012-13, page ii

<sup>29</sup> Fiscal Analysis of the Proposed Hotel Bella Project, Applied Development Economics, April 6, 2016

<sup>30</sup> Cannery Row Company, January 9, 2019

There is a secular change in commercial demand that is due to permanent demand reductions resulting from targeted rebate programs, conservation standards for the visitor-serving sector since 2002, mandatory conservation standards for other commercial businesses instituted in 2013, and commercial inspection/enforcement by the District. A “bounce-back” of 500 AFY would represent an increase in water use demand of 20% in the entire commercial sector, not just the hospitality industry. The District does not view this as likely in the near-term, nor due to a return to higher occupancy rates.

Hence, the case could be made that the tourism bounce-back demand assumption in the sizing of the MPWSP should be 100 to 250 AFA.

*Pebble Beach Buildout:* As cited earlier, at the time of the 2012 Application, the Pebble Beach company had approximately 325 AF of entitlements still available and that number was added to the MPWSP sizing needs. However, the final environmental impact report certified in 2012 envisioned 145 AFA for the buildout projects and 154 AFA in “other entitlement demand.”<sup>31</sup>

However, the “other entitlement demand” is very likely to go away when a new water supply comes online because homeowners will have no reason to pay \$250,000 per AF for an entitlement when connecting directly to Cal-Am is possible when the moratorium on new service connections is lifted. In the ten years since the CDO was imposed, Pebble Beach entitlement water demand has averaged 4.9 AF added each year. It is reasonable to assume only another 15 AFA during the next three years before a permanent water supply is online.

The project buildout from the EIR is 145 AFA, not 325 AFA used in MPWSP sizing. Further, the buildout number includes estimated water use that may not materialize in decades, if ever. Table 8 shows the elements that comprise the Pebble Beach buildout.

Table 8  
Components of Pebble Beach Buildout in AFA

Project	Demand
Lodge	13.11
Inn at Spanish Bay	12.85
Spyglass Hotel	30.59
Area M Residential	10.00
Other Residential	77.00
Driving Range	0.33
Roundabout	0.70
Total	144.58

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<sup>31</sup> Pebble Beach Final Environmental Impact report (FEIR), April 2012, Appendix H “Water Supply and Demand Information for Analysis”

Two elements of the project warrant greater discussion: “Other Residential” includes 66 single family residences at 1.0 AF each and 24 residences at 0.50 AF each (and a decrement of 1 AF in the total calculation for other reasons.) District research in 2006 determined the average large lot Pebble Beach home utilized 0.42 AFA. Building conservation standards have increased since then. Many of the proposed homes are not utilized year-round. Hence, the estimate could be overstated by one-third or more. Spyglass Hotel is not currently being pursued and there are no plans to do so in the near-term. The project could be a decade or two away, if ever.

Hence, the case could be made that the Pebble Beach buildout demand assumption in the sizing of the MPWSP should be 103 to 160 AFA.

### Summary of Demand v. Supply

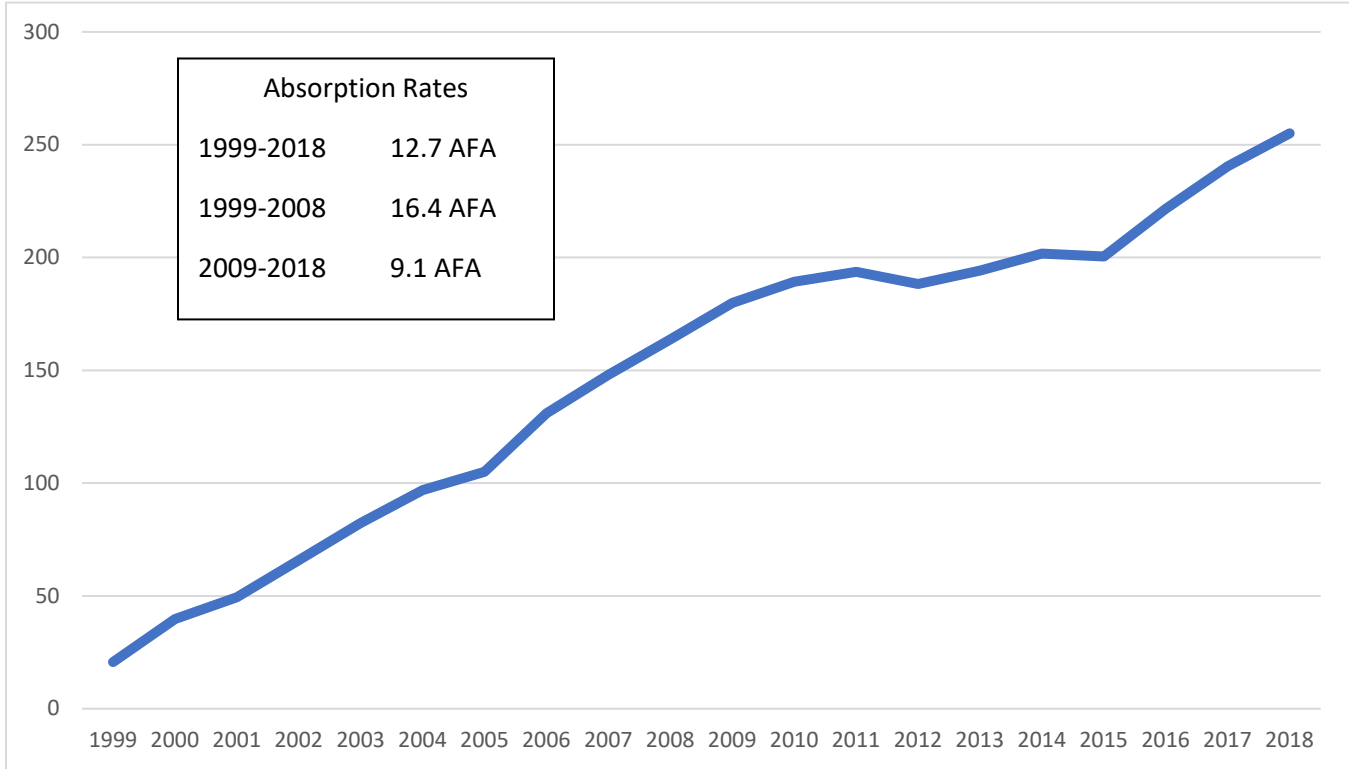
Table 9 shows the range of demand estimates that have been established in the foregoing analysis. These long-term demand estimates can be compared to existing current demand to determine how much water supply is needed.

Table 9  
Range of Potential Demand Scenarios in MPWSP Sizing  
(Acre-Feet)

Demand Component	Current Project	Revised High	Revised Low
Average Current Customer Demand	13,290	10,863	9,817
Legal Lots of Record	1,181	1,014	864
Tourism Bounce-Back	500	250	100
Pebble Beach Buildout	325	160	103
<b>Total Water Demand</b>	<b>15,296</b>	<b>12,287</b>	<b>10,884</b>

However, the ability of the Monterey Peninsula to generate or “absorb” the housing and commercial growth will help determine when such water supply is needed. Figure 2 shows the past 20 years of market absorption of water demand based on water permits issued. The average growth or absorption in water use was 12.7 AF per year. The first decade preceded the CDO and was a period of relative economic stability, available property, no moratorium on new service connections, and lower water rates resulting in 16.4 AF per year of absorption. The second decade was after the CDO and moratorium on service connections and understandably had a lower absorption rate of 9.1 AF per year.

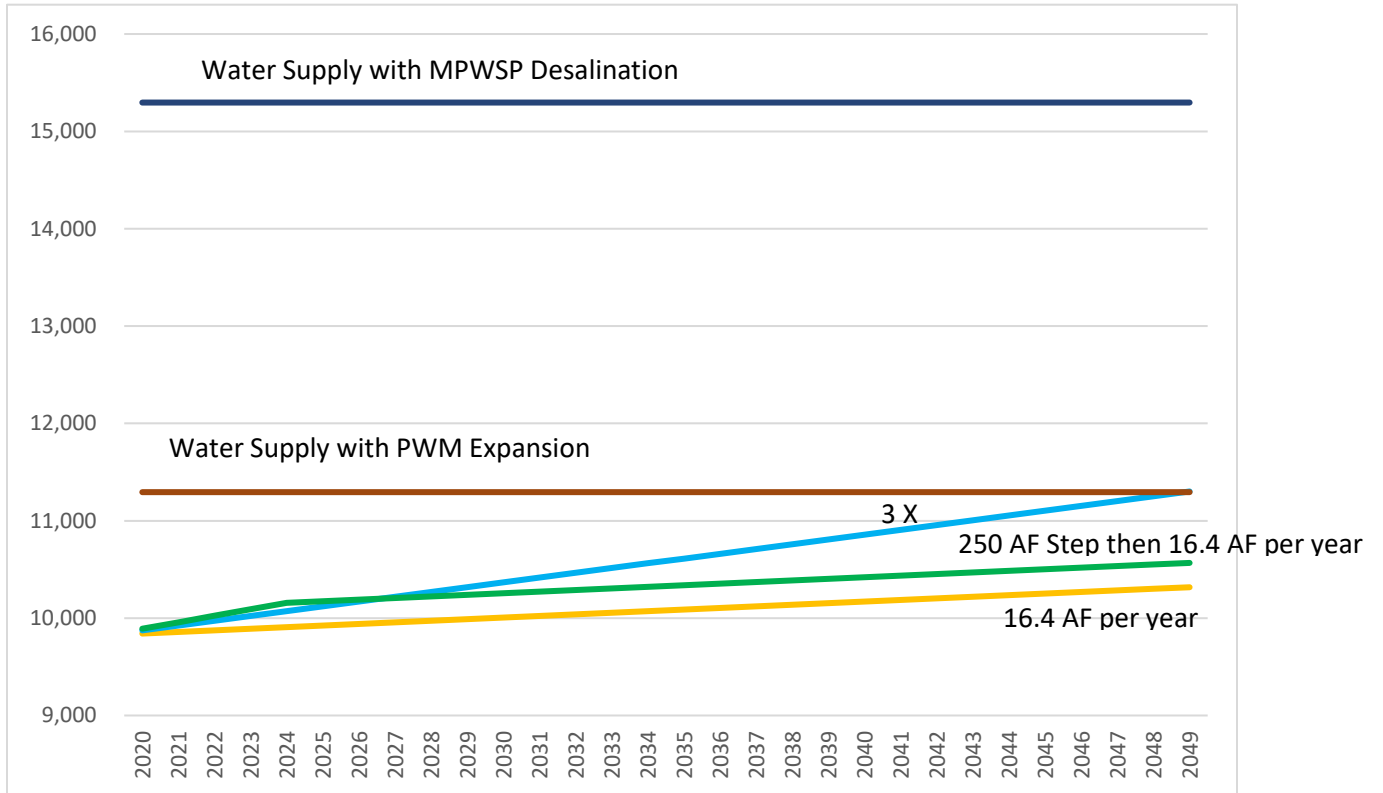
Figure 2  
 Market Absorption of Water Demand  
 Last 20 Years  
 (Acre-Feet)



By adopting assumptions about current demand and market absorption rates, it can be determined the sufficiency of certain supply alternatives over time.

*Scenario 1: Supply v Demand Using Pre-CDO Absorption Rate Scenarios:* In Figure 3, the current demand assumption of 9,825 AF (most recent 5-year average) is shown with three market absorption rates: (a) 16.4 AF per year (pre-CDO decade rate), (b) three times that rate, and (c) 250 AF over the first five years on top of the pre-CDO rate. These are also compared to the two supply alternatives in Table 1.

Figure 3  
 Market Absorption of Water Demand Compared to Water Supply  
 Current Demand at 5-Year Average  
 Pre-CDO Growth Rate Alternatives  
 (Acre-Feet)



This chart shows that, assuming a starting current demand at the 5-year average, both water supply alternatives meet 30-year market absorption at the historical rate, 250 AF in the first 5 years on top of the historical rate, and at 3-times the historical absorption rate.

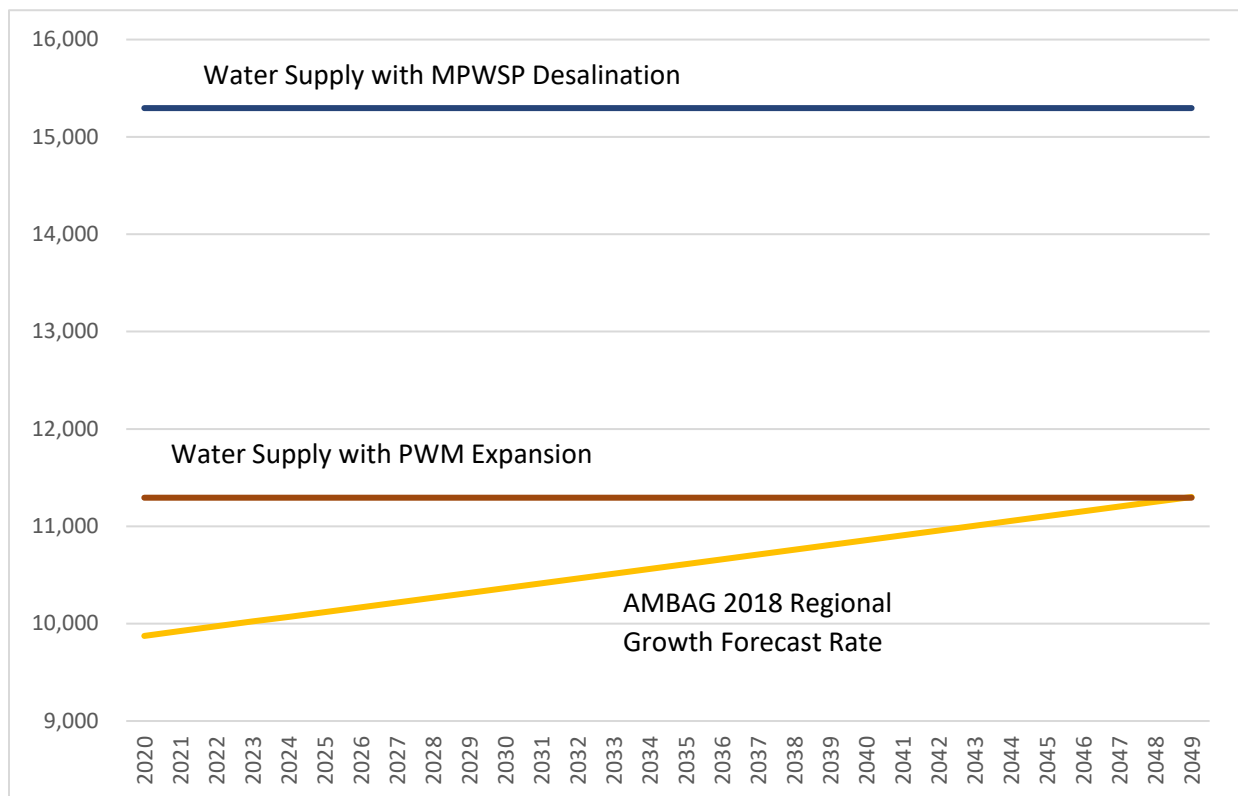
*Scenario 2: Supply v Demand Using 3<sup>rd</sup>-Party Growth Forecast Absorption Rate:* Rather than to rely on pre-CDO absorption of water demand or alternative theoretical future demand scenarios, as was done in the September report, it is instructive to instead look at a regional growth forecast by an objective third-party. Here, as shown in Appendix A, we evaluated AMBAG’s 2018 Regional Growth Forecast, specifically the subregional population forecast as a proxy for residential water demand, and the subregional employment forecast, using job growth as a proxy for commercial water demand. (Certainly, other factors could be considered.)

AMBAG implemented an employment-driven forecast model for the first time in the 2014 forecast and contracted with the Population Reference Bureau (PRB) to test and apply the

model again for the 2018 Regional Growth Forecast (RGF). To ensure the reliability of the population projections, PRB compared the employment driven model results with results from a cohort-component forecast, a growth trend forecast, and the most recent forecast published by the California Department of Finance (DOF). All four models resulted in similar population growth trends. As a result of these reliability tests, AMBAG and PRB chose to implement the employment-driven model again for the 2018 RGF.<sup>32</sup>

Using this methodology, the total water demand increase in the 20 year study period is 984 AF or 49.2 AFA. Applying the 49.2 AFA linearly across a 30-year horizon results in the demands shown in Figure 4.

Figure 4  
Market Absorption of Water Demand Compared to Water Supply  
Current Demand at 5-Year Average  
AMBAG 2018 Regional Growth Forecast  
(Acre-Feet)



This chart shows that, assuming a starting current demand at the 5-year average (inclusive of water year 2019), both water supply alternatives meet 30-year market absorption at the AMBAG 2018 Regional Growth Forecast rate.

<sup>32</sup> 2018 Regional Growth Forecast, Technical Documentation, Association of Monterey Bay Area Governments (AMBAG), June 2018, page 5



*Scenario 3: Supply v Demand Using “Pent-Up Demand” Plus AMBAG Growth Forecast*

**Absorption Rate:** The Regional Growth Forecast is intended to include new housing starts for increasing population, and new commercial businesses for job formation. However, several cities have approved and unbuilt projects that might happen more quickly once a permanent water supply becomes available and new meters can be set.

Examples of housing projects include Garden Road and Strangio in Monterey, Del Dono in Carmel, South of Tioga in Sand City, and various mixed-use projects and ADUs throughout the service area. Example non-residential projects include almost 120,000 square feet of commercial space at Ocean View Plaza in Monterey, approximately 1,250 rooms across five hotels in Pacific Grove (2) and Sand City (3). Hotels have their own demands and the guests can increase demand at local establishments. There can also be variability in students and service members attending MIIS, MPC, NPS, DLI, or living in the service area attending other institutions.

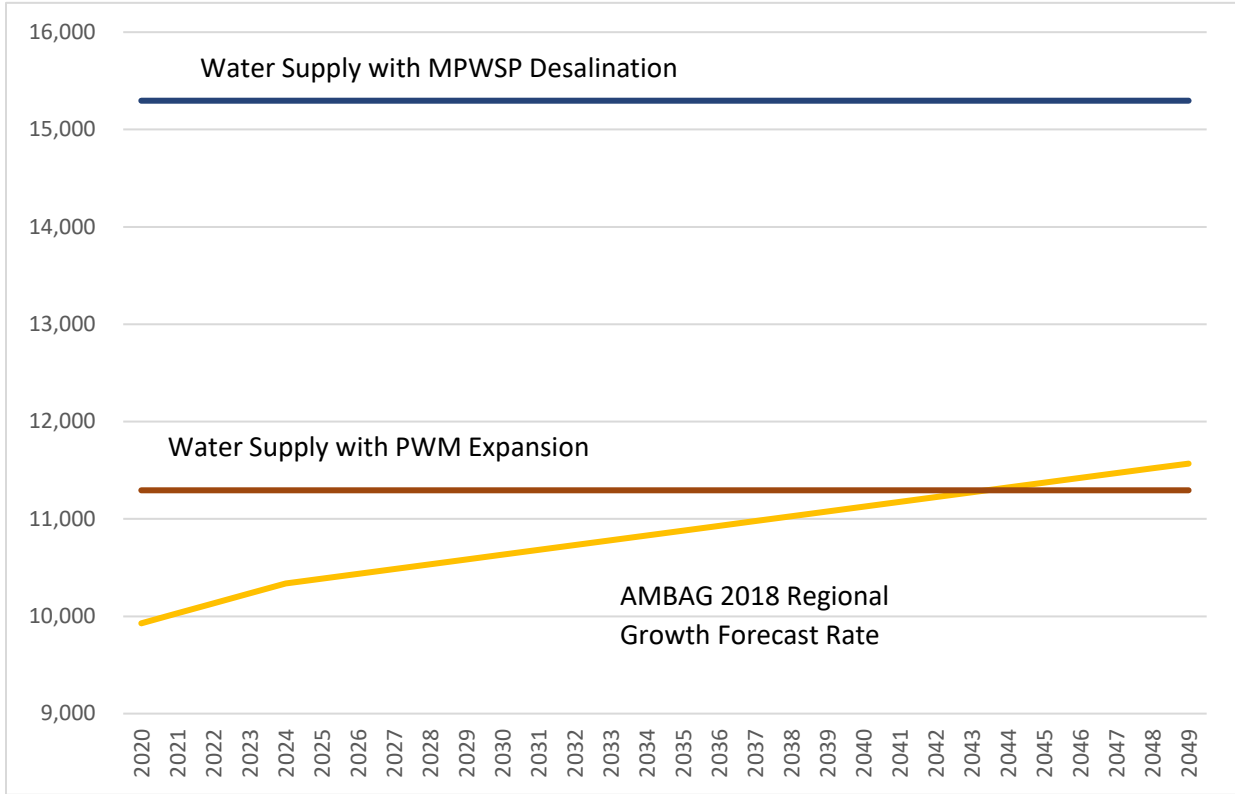
There is little likelihood that the market can absorb all of this quickly, but if it did there might be assumed to be something similar to the following pent-up near-term demand:

Table 10  
Potential Near-Term Demand  
(Acre-Feet)

Type of Demand	Acre Feet Required
1,250 Hotel Rooms X 0.064 AF/room	80
1.5 guests/room X 1,250 rooms X 75% occupancy X 0.02 AF/restaurant seat	28
200,000 new square feet of commercial space X 0.00007 AF/sq.ft.	14
1,000 new students X 57 gal/day X 260 days/Year	45
Approved but Unbuilt Housing	100
<b>TOTAL Near-Term Demand</b>	<b>267</b>

Figure 5 shows what the supply and demand relationship would be if this 267 AFA is added to the first five years, on top of the AMBAG Growth Forecast. The chart shows that, assuming a starting current demand at the 5-year average (inclusive of water year 2019), Pure Water Monterey Expansion meets 24-year market absorption, and the MPWSP desalination plant exceeds 30-year demands.

Figure 5  
 Market Absorption of Water Demand Compared to Water Supply  
 Current Demand at 5-Year Average  
 “Pent-Up” Demand in first 5 Years plus AMBAG 2018 Regional Growth Forecast  
 (Acre-Feet)



**Additional Factors Affecting Future Demand**

*Cost:* The future water supply will significantly impact rates. It is expected that the combined cost of new water supply and regular annual rate increases will almost double a residential ratepayer’s water bill by 2023. Rules of price elasticity suggest the cost of water might dampen demand. The cost of each major component of supply is shown below:

Desalination Plant	\$6,094 per acre-foot <sup>33</sup>
Carmel River:	\$271 per acre-foot <sup>34</sup>

<sup>33</sup> Attachment C-3 California American Water Company Advice Letter 1220 “Total Yr 1 Cost to Customer” \$38.1 million, divided by 6,252 acre-feet per year

<sup>34</sup> MPWSP Model- V 2.1 submitted to CPUC; February 2018 and October 2017 versions, 6.4 MGD scenario, “Avoided Costs” worksheet

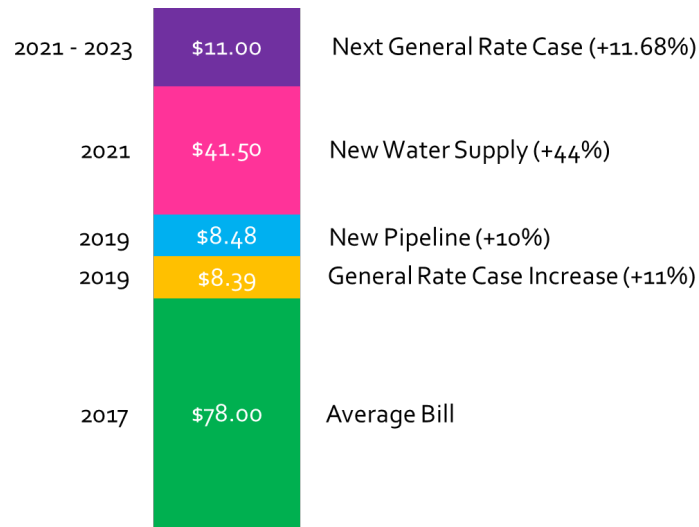
Seaside Basin:	\$130 per acre-foot <sup>35</sup>
Pure Water Monterey:	\$2,398 per acre-foot <sup>36</sup>
PWM with Expansion:	\$2,339 per acre-foot <sup>37</sup>

Further, if the desalination plant capacity is not fully utilized, the cost per acre-foot rises due to the fixed costs, as shown below.

Production by Desal Plant – AF	<u>6,252</u>	<u>5,000</u>	<u>4,300</u>
Variable Cost (\$ Million)	7.8	6.2	5.4
Fixed Cost (\$ Million)	<u>30.3</u>	<u>30.3</u>	<u>30.3</u>
Total Annual Cost to Customer	38.1	36.5	35.7
Cost per Acre-Foot	\$6,094	\$7,308	\$8,294

The rate impact can be seen in Figure 5 below, which is calculated based on full utilization of the desalination plant.

Figure 5  
Ratepayer Impacts of New Water Supply<sup>38</sup>



**Legislation:** On May 31, 2018, Governor Brown signed two bills which build on the ongoing efforts to “make water conservation a California way of life.” SB 606 (Hertzberg) and AB 1668

<sup>35</sup> MPWSP Model- V 2.1 submitted to CPUC; February 2018 and October 2017 versions, 6.4 MGD scenario, “Avoided Costs” worksheet

<sup>36</sup> Recent estimate for 2020-21 fiscal year

<sup>37</sup> Estimate

<sup>38</sup> “Your Rates Are Changing” California American Water mailer, April 2019 and “Notice of General Rate Case Application filed” July 2019

(Friedman) reflect the work of many water suppliers, environmental organizations, and members of the Legislature. The mandates will fall on urban water suppliers – not customers.

Specifically, the bills call for creation of new urban efficiency standards for indoor use, outdoor use, and water lost to leaks, as well as any appropriate variances for unique local conditions. Each urban retail water agency will annually, beginning November 2023, calculate its own *objective*, based on the water needed in its service area for efficient indoor residential water use, outdoor residential water use, commercial, industrial and institutional (CII) irrigation with dedicated meters, and reasonable amounts of system water loss, along with consideration of other unique local uses (i.e., variances) and “bonus incentive,” or credit, for potable water reuse, using the standards adopted by the State Water Board.

The indoor water use standard will be 55 gallons per person per day (gallons per capita daily, or GPCD) until January 2025; the standard will become stronger over time, decreasing to 50 GPCD in January 2030. For the water use objective, the indoor use is aggregated across population in an urban water supplier’s service area, not each household. Presently, the average June 2014-May 2019 gallons per capita per day for the Cal-Am Monterey system is 57 gpcd. Hence, existing users are unlikely to increase their water consumption with the availability of new water supply.

### **Principal Conclusions**

- Either supply option can meet the long-term needs of the Monterey Peninsula
- Either supply option is sufficient to lift the CDO
- The long-term needs of the Monterey Peninsula may be less than previously thought
- Several factors will contribute to pressure on decreasing per capita water use

## Appendix A

### Water Required to Meet AMBAG 2018 Regional Growth Forecast

Water Required for Population Growth<sup>39</sup>

	Monterey	Pacific Grove	Carmel-by-the-Sea	Sand City	Seaside	Del Rey Oaks	County <sup>40</sup>	TOTAL
Population in 2020	28,726	15,349	3,833	544	34,301	1,949	7,182	<b>91,884</b>
Population in 2040	30,976	16,138	3,876	1,494	37,802	2,987	7,541	<b>100,814</b>
Increase	2,250	789	43	950	3,501	1,038	359	<b>8,930</b>
GPCD <sup>41</sup>	56.8	56.8	56.8	56.8	56.8	56.8	56.8	<b>56.8</b>
Acre-Feet per Year	143 AF	50 AF	3 AF	60 AF	223 AF	66 AF	23 AF	<b>568 AF</b>

\*: Likely overstates population growth in Cal-Am service area due to some growth attributable to the Fort Ord build-out.

Water Required for Employment Growth<sup>42</sup>

	Monterey	Pacific Grove	Carmel-by-the-Sea	Sand City	Seaside	Del Rey Oaks	County <sup>43</sup>	TOTAL
Jobs in 2020	34,434	5,093	2,998	1,569	10,161	371	4,300	<b>58,926</b>
Jobs in 2040	40,173	5,808	3,378	1,810	11,299	432	4,845	<b>67,745</b>
Increase	16.7%	14.0%	12.7%	15.4%	11.2%	16.4%	12.7%	
Commercial Consumption In 2019 <sup>44</sup>	1,371 AF	248 AF	203 AF	54 AF	282 AF	21 AF	651 AF	<b>2,830 AF</b>
Commercial Consumption In 2040 <sup>45</sup>	1,600 AF	283 AF	229 AF	62 AF	314 AF	24 AF	734 AF	<b>3,246 AF</b>
Increase	229 AF	35 AF	26 AF	8 AF	32 AF	3 AF	83 AF	<b>416 AF</b>

Using this methodology, total water demand increase in 20 year period is 984 AF or 49.2 AFY.

<sup>39</sup> Association of Monterey Bay Area Governments. 2018. "2018 Regional Growth Forecast." Table 8, page 32

<sup>40</sup> Uses Cal-Am service area population reported in SWRCB June 2014 – September 2019 Urban Water Supplier Monthly Reports (Raw Dataset), minus urban areas, escalated at 5%.

<sup>41</sup> SWRCB June 2014 – September 2019 Urban Water Supplier Monthly Reports (Raw Dataset); Average gallons per capita per day for August 2018 – July 2019; [www.waterboard.ca.gov](http://www.waterboard.ca.gov)

<sup>42</sup> Association of Monterey Bay Area Governments. 2018. "2018 Regional Growth Forecast." Table 7, page 30

<sup>43</sup> California Employment Development Department, Monthly Labor Force Data for Cities and Census Designated Places. November 15, 2019. Sum of Carmel Valley Village CDP and Del Monte Forest CDP. Escalated at same rate as Carmel-by-the-Sea.

<sup>44</sup> Cal-Am. 2019. "Customers and Consumption by Political Jurisdiction"

<sup>45</sup> Assumes escalation at same rate as job growth 2020 to 2040

## Appendix B

### Water Required to Meet Regional Housing Needs Allocation Plan: 2014-2023

2014-2023 RHNA Goals by Local Jurisdiction<sup>46</sup>

	Monterey	Pacific Grove	Carmel-by-the-Sea	Sand City	Seaside	Del Rey Oaks	TOTAL
Total Allocation	650	115	31	55	393	27	1,271
Very Low (24.1%)	157	28	7	13	95	7	307
Low (15.7%)	102	18	5	9	62	4	200
Moderate (18.2%)	119	21	6	10	72	5	233
Above Moderate (42%)	272	48	13	23	164	11	531

\*: Does not include unincorporated Monterey County, which might be 15-25 additional AFY to full build-out

Estimated Water Required to Meet RHNA Goals on the Monterey Peninsula

	TOTAL RHNA GOAL	Water Required (AFY) <sup>47</sup>	Factor Used
Very Low (24.1%)	307	37	0.12 AFA (multi-family)
Low (15.7%)	200	24	0.12 AFA (multi-family)
Moderate (18.2%)	233	37	0.16 (half single family/half multi-family)
Above Moderate (42%)	531	92	0.173 (2/3 single family/1/3 multi-family)
<b>Total Allocation/Water Required</b>	<b>1,271</b>	<b>190</b>	

Over two similar 10-year periods, total water required for housing calculated with this methodology is 380 AF over twenty years, or 395 – 405 AF including estimate for unincorporated County (footnote above.)

<sup>46</sup> Association of Monterey Bay Area Governments. ND. "Regional Housing Needs Allocation Plan: 2014-2023." Available at: [https://ambag.org/sites/default/files/documents/RHNP%202014-2023\\_Final\\_revised.pdf](https://ambag.org/sites/default/files/documents/RHNP%202014-2023_Final_revised.pdf).

<sup>47</sup> Calculated based on the RHNA goals for the six cities in the Monterey Peninsula and MPWMD's water use factors for single family units (0.2 AFA) and multi-family units (0.12 AFA).

## **Appendix C**

### **Pure Water Monterey Expansion Consistency With Planning Criteria**

MPWMD has consistently followed state and federal codes, as well as industry standards, in its analysis of the two supply options in the report. Specifically, any MPWMD conclusions in the report are consistent with the following:

- California Code of Regulations (CCR) section 64554
- California Health and Safety Code (CHSC) section 116555
- California Water Code (CWC) sections 10635 and 10631
- CPUC General Order 103A and other rules; and
- American Water Works Association “Water Resource Planning” guidance M50

*CCR section 64554:* MPWMD meets the requirements of CCR Title 22 section 64554. This was shown in a document produced and available from MPWMD in September 2019 and later publicly filed by the California Coastal Commission demonstrating MPWMD compliance.<sup>48</sup> With the passage of time, that analysis has been updated and is included in this Appendix C, now assuming a new water supply comes online in the year 2023. It shows that Pure Water Monterey expansion can meet the Maximum Day Demand (MDD) and Peak Hourly Demand (PHD) required under this section of the CCR.

There is no standard in 64554 to look back 10 years to ascertain current or projected future average annual demand. Section (k) which says *“The source capacity of a surface water supply or a spring shall be the lowest anticipated daily yield based on adequately supported and documented data”* by citing “daily yield”, still goes to MDD and PHD, not long-term average annual demand. This bears repeating: CCR section 64554 has nothing to with estimating current existing consumer demand or future average annual consumer demand for water.

*CHSC section 116555:* All that is required under this section of the Code is that a water supplier “provides a reliable and adequate supply of pure, wholesome, healthful, and potable water.” Nothing more, nothing less. To assert that either Pure Water Monterey expansion or the proposed desalination plant do not do so would be disingenuous.

*CWC sections 10635 and 10631:* Section 10635 of the CWC requires that *“every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years.”*

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<sup>48</sup> See California Coastal Commission agenda, November 14, 2019, Application 9-19-0918 / Appeal A-3-MRA-19-0034 (California American Water Co.) Exhibit 9 staff note attachment

*This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years.”* MPWMD has done so with respect to both proposed water supply sources and have concluded that they can each meet the challenges of a normal water year, a single dry water year, and a 5-year drought. Drought resilience of Pure Water Monterey and ASR is discussed in more detail below.

We also recognize section 10631 reiterates the above-said requirement in the plan. Section 10631 also requires analysis by the utility of (i) Water waste prevention ordinances; (ii) Metering; (iii) Conservation pricing; (iv) Public education and outreach; (v) Programs to assess and manage distribution system real loss; (vi) Water conservation program coordination and staffing support; and (vii) Other demand management measures. These programs, many of which have been sponsored by MPWMD, have led to the decline in water demand that sets the baseline for future water supply planning.

*CPUC General Order 103A and other rules:* MPWMD’s analysis has met the requirements of CPUC General Order 103A which states all water supplied shall be *“obtained from a source or sources reasonably adequate to provide a reliable supply of water”* and *“shall have the capacity to meet the source capacity requirements as defined in CCR Title 22, Section 64554”*. This has been addressed above.

The CPUC’s *“Rate Case Plan and Minimum Data Requirements for Class A Water Utilities General Rate Case (GRC) Applications”* states utilities should *“forecast customers using a five-year average of the change in number of customers by customer class”* subject to unusual events (such as a meter moratorium here in Monterey). MPWMD has also recognized this regulatory guidance.

*American Water Works Association (AWWA) “Water Resource Planning” guidance M50:* AWWA recognizes there are 6 traditional forecasting methods.<sup>49</sup> MPWMD’s report has incorporated at least three of the accepted methods: *“per capita models”*, *“extrapolation models”*, *“disaggregate water use models”*, and have checked certain estimates using *“land-use models”* each recognized by AWWA. Further, to the extent MPWMD has analyzed the AMBAG growth forecast and assigned water usage to the population and job forecasts, *“multivariate”* modeling has been included, also recognized by AWWA. *“Several methods of demand forecasting are often combined, even within a single utility.”*<sup>50</sup>

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<sup>49</sup> AWWA, *“Water Resources Planning: Manual of Water Supply Practices M50”*, 3<sup>rd</sup> Edition, pages 81-84.

<sup>50</sup> AWWA, *“Water Resources Planning: Manual of Water Supply Practices M50”*, 3<sup>rd</sup> Edition, page 81, paragraph 2.



The out-of-date second edition of AWWA M50 does cite a period of 10 years of historical data be used to develop future forecasts of demand, but the same section also states *“If a simple per capita approach to forecasting is selected, the data requirements could be as easy as securing historical annual water production or sales for 5 to 10 years”* Hence, MPWMD’s use of a 5-year period would have been acceptable.<sup>51</sup> However, that edition of M50 was superseded by the third edition published in 2017. The current M50 edition from AWWA does not reference a specific preferred time period for historical data to be used for a future demand forecast. The MPWMD analysis is consistent with the current section of M50. There is nothing wrong, or outside industry standards, with looking at a 5-year average or some other measure to determine “How much water do we use today?”

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<sup>51</sup> AWWA, “Water Resources Planning: Manual of Water Supply Practices M50”, 2<sup>nd</sup> Edition, pages 47-48

## Drought Resilience of ASR and Pure Water Monterey

*ASR:* Based on the Benito/Williams technical memorandum modeling assumptions contained in the Pure Water Monterey SEIR appendices, MPWMD concludes that build-up of ASR storage would be sufficient to meet a 5-year drought. The build-up occurs based on historical data including wet, normal, and dry years. If the data is randomized, the same results will occur – ASR acts like a lake behind a dam, building up supplies for use later during a drought. To remove ASR from the resource planning mix is inappropriate and would be inconsistent with industry practice for estimating water supply availability. Even AWWA recognizes ASR in its reliability assessment: *“ASR wells can improve water basin management by storing water underground from periods of excess supply..., and later allowing a portion of the stored water to be extracted during periods of demand or short supply”*<sup>52</sup>

If the Monterey Peninsula were to experience drought during the “buildup period” following the completion of new water supply and the lifting of the CDO, ASR would arguably be delayed in building up a drought reserve, it should not be overlooked that a Pure Water Monterey expansion is new capacity without an immediate offsetting demand. That is, 2,250 AFA from Pure Water Monterey expansion would provide the necessary approximately 800 AFA to offset unlawful Carmel River diversions and lift the CDO and provide a remaining 1,450 AFA for which there is no immediate present-day demand and can instead be delivered for customer service in the early years if ASR’s drought reserve has not yet built-up. Just a few years of Pure Water Monterey expansion water could also provide drought-resilience to the Monterey Peninsula.

The District believes the Benito/Williams memo demonstrates ASR is drought-resilient and Pure Water Monterey expansion provides an additional factor of safety against drought impacts to ASR.

*Pure Water Monterey:* A memorandum dated November 1, 2019 which appears as Appendix I to the Pure Water Monterey Supplemental Environmental Impact Report titled “Source Water Availability, Yield and Use Technical Memorandum”, indicates Pure Water Monterey is resilient to drought, in general. Page 1 of the memorandum states the purpose of the memorandum is to summarize the source water availability and yield estimates for proposed modifications to the approved Pure Water Monterey Groundwater Replenishment Project (as modified, the full project is referenced as the Expanded PWM/GWR Project), to explain the seasonal storage yield estimates, and to provide the proposed maximum and typical (or normal) water use estimates for the Proposed Modifications.

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<sup>52</sup> AWWA, “Water Resources Planning: Manual of Water Supply Practices M50”, 3<sup>rd</sup> Edition, page 148

Page 10 of the memorandum says *“In the attached scenario tables (Tables 9 through 11), the use of the various sources is reduced to just meet the demands of the AWPf and offset the current CSIP groundwater use in the wet season (October-March). During the dry season (April-September), surface water diversions are shown meeting the monthly AWPf demands and providing extra flow for the CSIP, such that **the annual use of new sources exceeds the annual AWPf demands.**”* (emphasis added by MPWMD)

*“The demand scenarios considered are:*

*Table 9: A normal water year while developing a drought reserve (AWPF producing 6,550 AFY)*

*Table 10: A normal water year with a full drought reserve (AWPF producing 6,350 AFY)*

***Table 11: A drought year starting with a full reserve (AWPF producing 5,550 AFY)*** (emphasis added by MPWMD)

*In the drought year scenario, the stormwater and wastewater availability were reduced. Urban runoff from Salinas was assumed to be one-third of the historic average. Rainfall on the SIWTF ponds used the 2013 rainfall record (critically dry year). The unused secondary treated effluent values from 2013 were used, also the historic low. The CSIP groundwater well use from OCT 2013 to SEP 2014 was used as the CSIP augmentation target. Under this scenario, surface water diversions were required from the Reclamation Ditch, Blanco Drain and Lake El Estero, and the diversions were needed from March through November.”*

In MPWMD’s opinion, this shows that the drought scenario shows all Advanced Water Purification Facility needs are met and there are still residual new supplies available to CSIP. In other words, Pure Water Monterey expansion is reliable in periods of reduced usage or drought years.

**MPWMD Analysis of Available Well Capacity  
for 10-Year Maximum Daily Demand (MDD)  
and Peak Hour Demand (PHD)**

- A) Find maximum month demand for 10-year period 2014-2023  
August 2014 = 1,023 AF<sup>53</sup>
- B) Convert to average daily demand  
 $1,023 \text{ AF} / 31 \text{ days} = 33 \text{ AF/day}$
- C) Convert to million gallons per day (MGD)  
 $33 \text{ AF/day} \times 325,851 \text{ gal/AF} \text{ divided by } 1,000,000 = 10.753 \text{ MGD}$
- D) Gross-up for peaking factor of 1.5  
 $10.753 \text{ MGD} \times 1.5 = 16.13 \text{ MGD} = \text{Maximum Daily Demand (MDD)}$
- E) Average hourly flow during MDD is 10.753 MGD divided by 24 hours = 0.448 MGh
- F) Gross-Up for peaking factor of 1.5  
 $0.448 \text{ MGh} \times 1.5 = 0.672 \text{ million gallons per hour} = \text{Peak Hour Demand (PHD)}$

Hence, new water supply must support a MDD of 16.13 MGD. Table 1 on the next page shows existing and planned system supply capacities under authorized, desired, and firm capacity scenarios. As can be seen, the lowest available capacity is 19.41 MGD which significantly exceeds MDD.

This assumes additional production well capacity currently being analyzed in the Pure Water Monterey Expansion Supplemental EIR are developed and the Forest Lake Pump Station currently requested under the 2019 General Rate Case filing is built. These two projects markedly remove system capacity constraints.

We also recognize that the Plumas, Luzern, Ord Grove, Paralta, and Playa wells are presently unable to deliver to the Monterey Pipeline, serving only Seaside, Sand City, and Old Monterey. This could potentially reduce available capacity throughout the rest of the system on the order of 2 MGD. Even in this instance, operations are sufficient to meet MDD. This issue goes further away if one or more of the wells are also connected to the pipeline, as well as with the continued reduction in MDD in more recent years.

**CONCLUSION:** Pure Water Monterey expansion provides sufficient capacity to meet MDD and PHD for the Cal-Am Monterey Main System.

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<sup>53</sup> Direct testimony of Ian Crooks, Errata version 9-27-17 in A.12.04.019 at California Public Utilities Commission, page 9, Table 3

TABLE 1

Cal-Am Monterey Main Well Capacity						
Under Authorized and Desired Operations						
With New Wells being Analyzed in Pure Water Monterey Expansion SEIR						
	Authorized Operations		Desired Operations		Desired Operations Firm Capacity	
	Capacity (gpm)	Capacity (MGD)	Capacity (gpm)	Capacity (MGD)	Capacity (gpm)	Capacity (MGD)
<b>Upper Carmel Valley Wells</b>						
Assume n/a in Summer	-	-	-	-	-	-
<b>Lower Carmel Valley Wells</b>						
Rancho Canada	1,150	1.66	1,200	1.73	1,200	1.73
Cypress	1,500	2.16	-	-	-	-
Pearce	1,500	2.16	-	-	-	-
Schulte	1,250	1.80	-	-	-	-
Manor	125	0.18	-	-	-	-
Berwick No 8.	600	0.86	-	-	-	-
Berwick No. 9	985	1.42	-	-	-	-
Subtotal Lower CV	7,110	10.24	1,200	1.73	1,200	1.73
<b>Seaside Wells</b>						
Plumas	192	0.28	192	0.28	192	0.28
Luzern	640	0.92	640	0.92	640	0.92
Ord Grove	1,000	1.44	1,000	1.44	1,000	1.44
Paralta	1,350	1.94	1,350	1.94	1,350	1.94
Playa	350	0.50	350	0.50	350	0.50
Santa Margarita ASR 1 or 2	1,750	2.52	1,750	2.52	1,750	2.52
Middle School ASR 1 or 2	1,750	2.52	1,750	2.52	1,750	2.52
Subtotal Seaside	7,032	10.13	7,032	10.13	7,032	10.13
<b>4 New Wells in Pure Water Expansion SEIR</b>						
New 1	1,750	2.52	1,750	2.52	1,750	2.52
New 2	1,750	2.52	1,750	2.52	1,750	2.52
New 3	1,750	2.52	1,750	2.52	1,750	2.52
New 4	1,750	2.52	1,750	2.52	-	-
Subtotal New	7,000	10.08	7,000	10.08	5,250	7.56
<b>Total Well Capacity</b>	<b>21,142</b>	<b>30.44</b>	<b>15,232</b>	<b>21.93</b>	<b>13,482</b>	<b>19.41</b>
<b>Notes:</b>						
gpm = Gallons per Minute						
MGD = Million Gallons per Day						
AF = Acre-Feet						
Firm Capacity = Without largest producing well						

**CALIFORNIA AMERICAN WATER**  
**Central Division - 2019 GRC**  
**WATER PRODUCTION (KCCF)**  
**AUTHORIZED AND PROPOSED**

Filing: 100-Day update

**Appendix D**  
**Cal-Am Sales Forecast**  
**(Current Demand)**  
**From 2019 GRC Application**

Line No.	Description	Last Authorized Test Year		Estimated		Proposed Test Year		Escalation Year	
		2018	2019	2020	2021	2021	2022	2022	2022
1.	Metered Sales	4,172.6	3,989.7	3,989.7	3,989.7	3,989.7	3,989.7	3,989.7	3,989.7
2.	Other Consumption	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.	Total Consumption	4,172.6	3,989.7	3,989.7	3,989.7	3,989.7	3,989.7	3,989.7	3,989.7
4.	Non Revenue	363.6	274.5	274.5	274.5	274.5	274.5	274.5	274.5
5.	Total Water Requirement	4,536.2	4,264.3	4,264.3	4,264.3	4,264.3	4,264.3	4,264.3	4,264.3
6.	Non Revenue Water %	8.0%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
7.	Equivalent Acre Feet	10,413.6	9,789.4	9,789.4	9,789.4	9,789.4	9,789.4	9,789.4	9,789.4
8.	Total Water Requirement in CCF	4,536,162	4,264,251	4,264,251	4,264,251	4,264,251	4,264,251	4,264,251	4,264,251
<b>References:</b> Line 1 Metered sales per Table 3.11 Other Consumption per [insert text if applicable] Line 3 is sum of lines 2 and 3. Line 4 is based on projection. See REV W/kp [insert reference] Line 5 is line 3 plus 4 Line 6 is line 4 divided by line 5. Line 7 is line 5 divided by 435.6 and multiplied by 1,000 to convert to Acre Feet. Line 8 is line 5 multiplied by 1,000 to convert of CCF.									