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Th7a8a

Appeal No. A-3-MRA-19-0034 & Coastal Permit No. 9-20-0603

NOVEMBER 17, 2022

EXHIBITS

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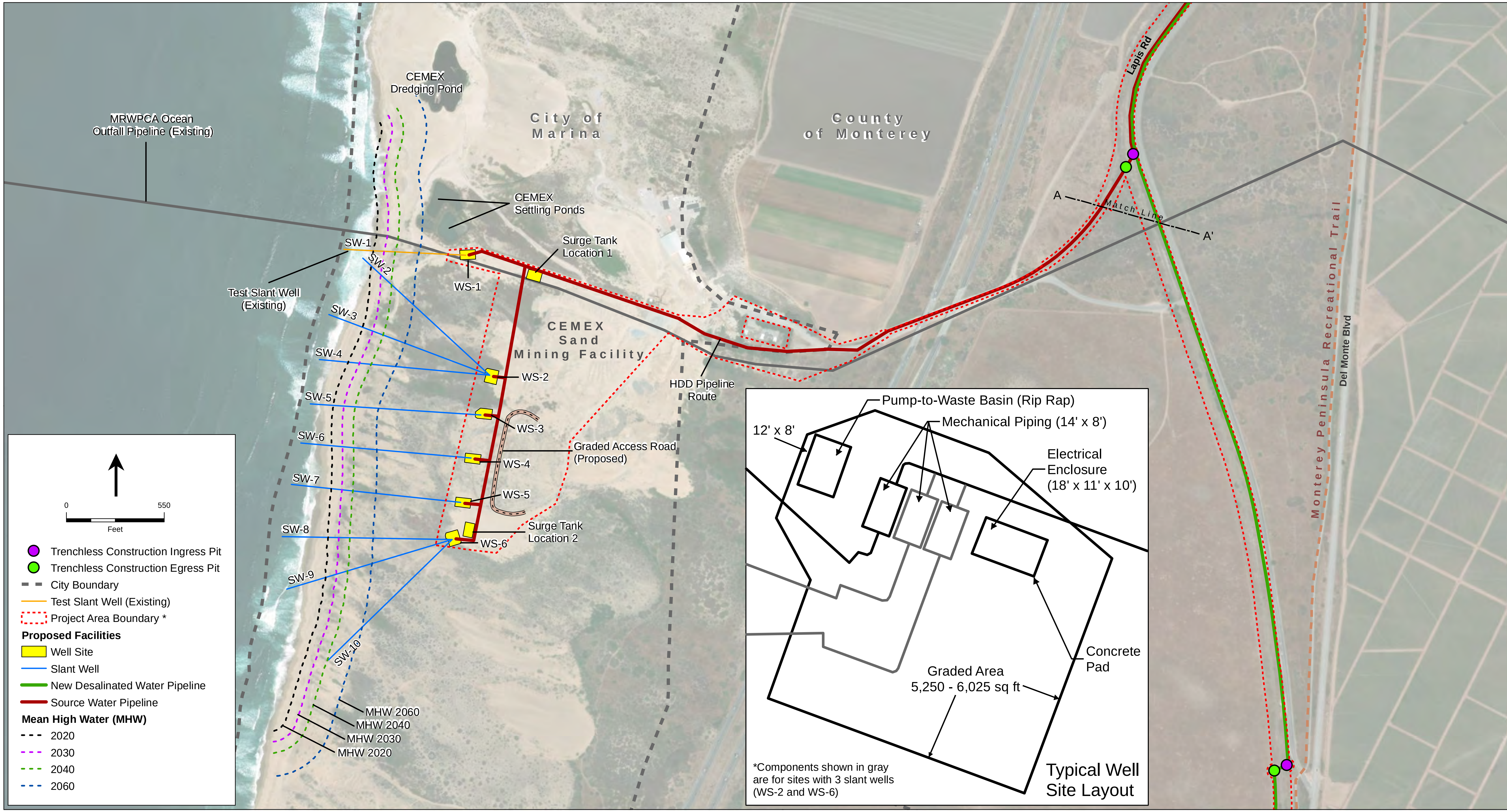
NOTE:
*The ASR Pipelines are the ASR Conveyance Pipeline, the ASR Pump-to-Waste Pipeline, and the ASR Recirculation Pipeline. See Figure 3-9a for the individual pipeline alignments.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure ES-1
Monterey Peninsula Water Supply Project Overview



NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

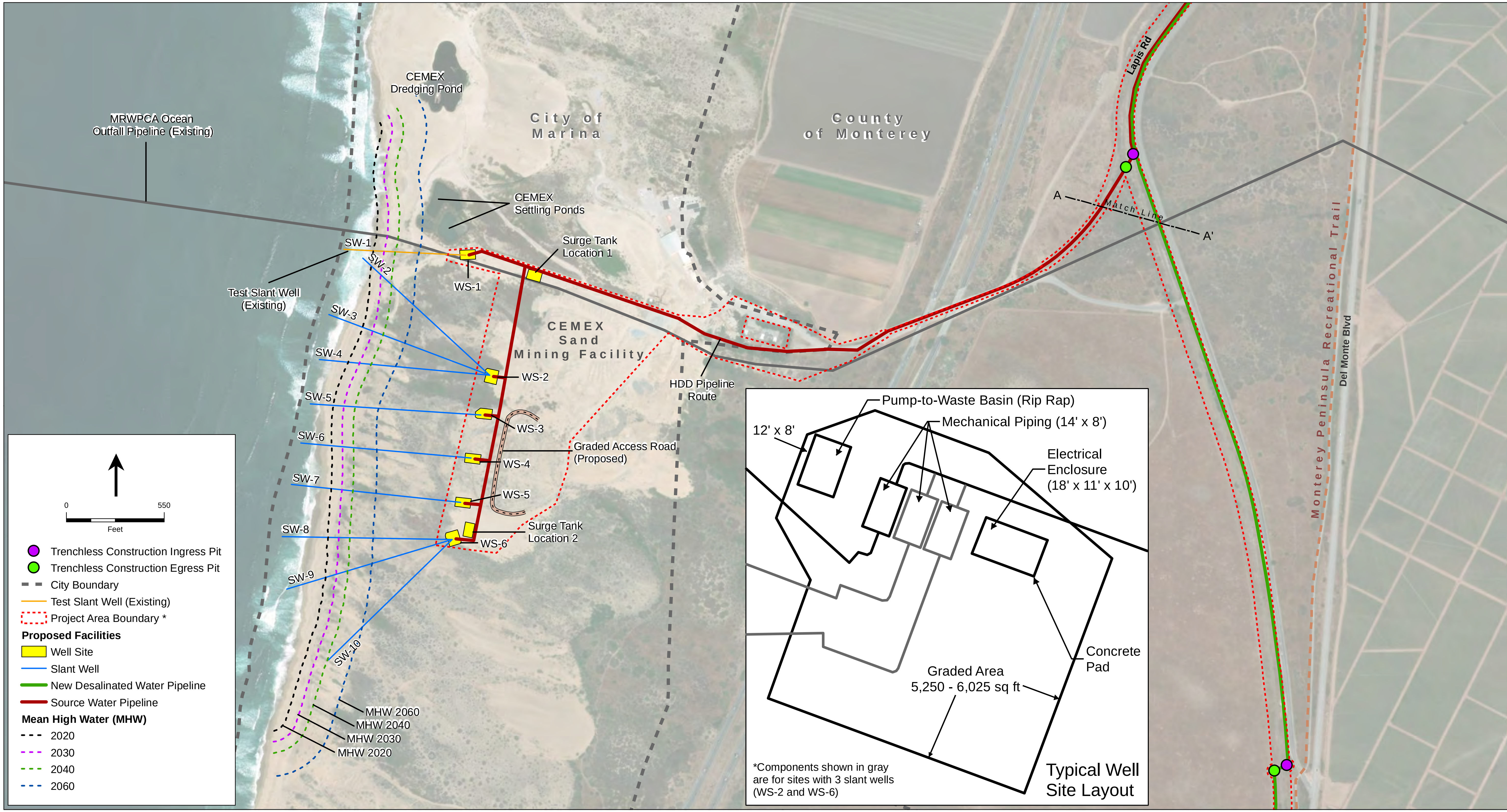
SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-3a

MPWSP Seawater Intake System

Th7a & 8a - Exhibit 2



NOTE:
*Project area boundary refers to the area within which all construction related disturbance would occur.

SOURCE: ESA, 2016

205335.01 Monterey Peninsula Water Supply Project

Figure 3-3a

MPWSP Seawater Intake System

Th7a & 8a - Exhibit 3

CALIFORNIA AMERICAN WATER

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October 5, 2022

VIA EMAIL

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603 & Appeal No. A-3-MRA-19-0034: Potential Slant Well Network Phasing

Dear Tom:

Based on our ongoing outreach to members of the Monterey Peninsula Community, as well as our discussions with Coastal Commission staff, California American Water Company ("CalAm") is proposing to amend its proposal for the Monterey Peninsula Water Supply Project ("MPWSP") to phase the MPWSP's slant well network on the CEMEX site. Specifically, CalAm is proposing to build a slant well network that supplies source water to support an initial desalination plant production capacity of 4.8 million gallons of water per day ("mgd"), with the ability to add slant well infrastructure in the future as needed to support increasing the MPWSP's capacity up to 6.4 mgd. This phased approach, as detailed in **Exhibit A**, would give CalAm sufficient additional water supplies to meet its expected water needs by 2030, while maintaining the flexibility CalAm needs to add additional production wells when additional water supplies are required in the future. As summarized below, a phased approach would provide several benefits that would further applicable Coastal Act and Marina Local Coastal Program ("LCP") policies, as well as reduce the MPWSP's potential environmental impacts on the CEMEX site. We hope that this proposal will assist Commission staff in its ongoing evaluation of the MPWSP.

Environmentally Sensitive Habitat Areas. A 4.8 mgd desalination facility would require only four new slant wells, plus the existing slant well, on the CEMEX site – two fewer wells than the currently proposed 6.4 mgd facility. As a result, CalAm only would need to construct two new well pads, with two slant wells on each pad. This would reduce the MPWSP's potential impacts to ESHA on the CEMEX site from construction of the well pads by approximately 50 percent. Nevertheless, CalAm is committed to mitigating for potential ESHA impacts that would be caused by construction of the entire 6.4 mgd MPWSP upfront, as part of the first phase of the MPWSP, to ensure consistency with Coastal Act Section 30240 and Marina's LCP. In addition, the proposed reduction of slant wells allows CalAm to eliminate the use of the southern loop access road to further reduce impacts to ESHA. CalAm is in the process of preparing an updated site plan reflecting the proposed changes, which we plan to provide to staff in the coming days.

Th 7a & 8a -- Exhibit 4

Environmental Justice and Public Access. The reduced MPWSP footprint on the CEMEX site responds to public input requesting a smaller facility, and would benefit Marina residents and promote Marina's LCP policies aimed ensuring that new development considers beach access where compatible. Less permanent above-ground infrastructure would be required and built within Marina. In addition, the construction of fewer wells would reduce construction activities and the duration of construction, which would reduce associated impacts in Marina.

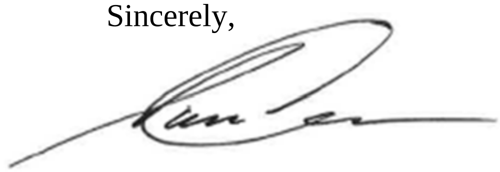
Groundwater. A 4.8 mgd facility will use approximately 25 percent less source water, which reduces the MPWSP's potential impacts to groundwater resources and nearby wetlands and vernal ponds consistent with Coastal Act Section 30231. Further, CalAm proposes to extend the length of the four new slant wells to approximately 1,000 feet long or longer in order to extend the wells further under the seafloor.

Sea Level Rise. A phased approach provides CalAm and Commission staff the opportunity to assess and adapt to changing sea levels and other coastal hazards. While CalAm maintains that the current slant well network location would be resilient to sea level rise and coastal hazards during the well network's economic life, consistent with Coastal Act Section 30253, CalAm and staff would have the benefit of more current science on sea level rise when considering the second MPWSP phase.

Need. CalAm and others recently have submitted testimony to the California Public Utilities Commission ("CPUC") concerning updated supply and demand analyses in CalAm's Monterey service territory, but the CPUC is not expected to consider that testimony until 2023. While CalAm's analysis demonstrates the need for the full 6.4 mgd MPWSP by 2050, CalAm acknowledges there is disagreement among various constituents about when the MPWSP's supplies will be needed. A phased approach helps address such concerns and uncertainty, ensuring that some additional desalinated water supplies will be made available in the near term to provide reliability and help lift the moratorium on new water service connections and enable the development of needed affordable housing and other uses.

We appreciate staff's consideration of the MPWSP and the opportunity to update you with CalAm's proposal for a phased MPWSP. Please do not hesitate to contact us should you have any questions.

Sincerely,



Ian Crooks
California American Water Company

Attachment

cc: Kate Huckelbridge, California Coastal Commission
Kathryn Horning, California-American Water Company
DJ Moore, Latham & Watkins LLP
Winston Stromberg, Latham & Watkins LLP

EXHIBIT A

<u>Proposed Slant Well Network Phasing for the Monterey Peninsula Water Supply Project</u>

Proposal: Construct a slant well network on the CEMEX site that supports an initial production capacity for the MPWSP of 4.8 million gallons per day (mgd), with the ability to construct additional slant well infrastructure in the future to support increasing in production capacity up to 6.4 mgd.

- **Need for Desalination:** Based on CalAm's 2020 Urban Water Management Plan, CalAm would need 4,900 acre-feet a year (afy) in the second-year of a multi-year drought by 2030.
  - In a longer drought, CalAm could need well more than 4,900 afy by 2030.
  - Balancing uncertainty and considering both normal and drought conditions, CalAm needs at least 4,000 afy by 2030, which could be provided by a 4.8 mgd plant.
- **Required Infrastructure:** A 4.8 mgd MPWSP would only require four new slant wells, plus the existing slant well, for five total wells, on the CEMEX site. The new slant wells are planned to be approximately 1,000 feet long or more (the existing test slant well is approximately 700 feet long), and therefore would extend further beneath the seafloor.
  - This is two fewer wells than the full 6.4 mgd MPWSP, which requires seven wells.
  - Instead of constructing four new well pads on the CEMEX site to host six wells for the 6.4 mgd MPWSP, under this proposal CalAm would construct just two new well pads, with two slant wells on each pad. This will reduce ESHA impacts from the well pads by approximately 50%.
  - While the proposed loop access road to the slant wells will be used temporarily during construction, only a portion of the loop road would be needed for ongoing operations and Maintenance. Therefore permanent ESHA impacts would be reduced.
  - Omitting two slant wells also would reduce total MPWSP infrastructure costs.
- **Thresholds for Second Phase:** CalAm would have the ability to seek Coastal Commission approval to add an additional well or wells to the MPWSP if:

  (1) Actual system demand reaches 80% of CalAm's firm supplies for a two-year period; or

  (2) PWM and PWM Expansion fail to deliver the minimum Water Guarantee of 4,600 acre-feet for a two-year period; or

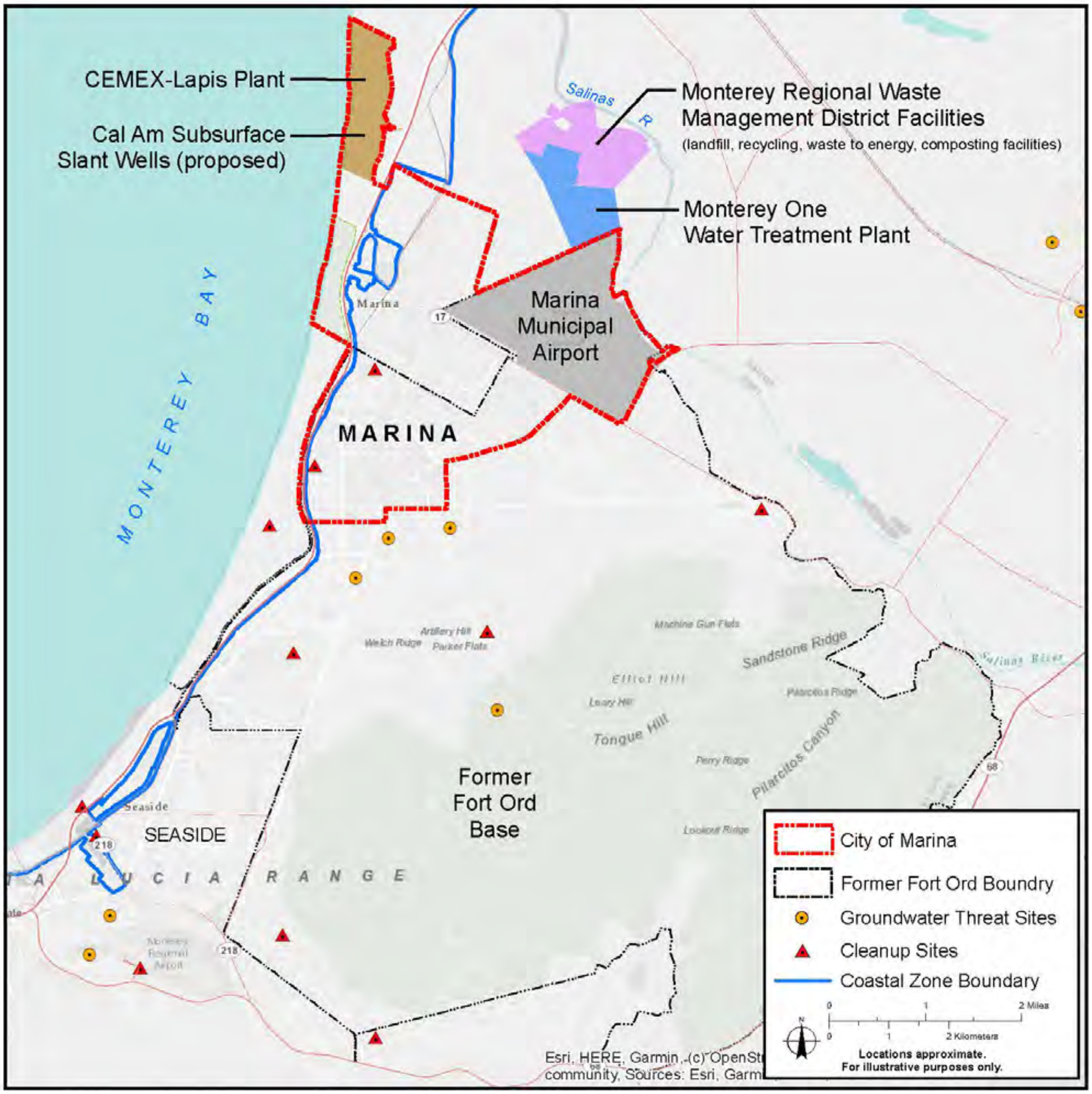
  (3) The CPUC determines that CalAm needs to develop a desalination facility that is larger than 4.8 mgd.
- **Process for Implementing Second Phase:**
  - If one of the Second Phase thresholds is triggered, and it is feasible to add a third well to an existing well pad based on the operation and configuration of the existing wells, staff

could process a second phase to expand the MPWSP up to a 6.4 mgd facility administratively, without requiring a CDP amendment, provided that: (i) the Executive Director confirms that the second phase as proposed is consistent with the terms and conditions of the issued CDP; and (ii) there are no changed circumstances under the California Environmental Quality Act (CEQA).

  - CalAm would be required to apply for a CDP amendment for the second phase if: (i) a new well pad is required; or (ii) the Executive Director determines either that the second phase is not consistent with the terms and conditions of the issued CDP or there are changed circumstances under CEQA.

- **Mitigation:** CalAm proposes to mitigate for potential ESHA impacts caused by the entire 6.4 mgd MPWSP upfront as part of the first phase of 4.8 mgd.

- **Impact of California Public Utilities Commission (CPUC) Decision Reducing MPWSP Scope:** The CPUC is currently evaluating updated information on water supply and demand in CalAm's Monterey service territory as part of proceeding A-21-11-024. If the CPUC determines in that proceeding that CalAm needs to develop a desalination facility that is smaller than 4.8 mgd, CalAm would reduce the number of wells on the CEMEX site as needed to produce an amount of water consistent with the CPUC's determination and would submit those details to the Executive Director for review. If the CPUC determines in that proceeding that CalAm needs to develop a desalination facility that is smaller than 6.4 mgd but larger than 4.8 mgd, CalAm may seek to amend the CDP, if necessary, to authorize a modified second phase.



Th 7a & 8a – Exhibit 5

Appendix B

Mitigation Measure 4.6-1n of the FEIR/EIS:
Habitat Mitigation and Monitoring Program

Mitigation Measure 4.6-1n applies to the subsurface slant wells, MPWSP Desalination Plant, Source Water Pipeline and Source Water Pipeline Optional Alignment, New Desalinated Water Pipeline and New Desalinated Water Pipeline Optional Alignment, Castroville Pipeline and Castroville Pipeline Optional Alignments, Proposed ASR Facilities (ASR-5 and ASR-6 Wells, ASR Pump-to-Waste Pipeline, ASR Conveyance Pipeline, and ASR Recirculation Pipeline), New Transmission Main and New Transmission Main Optional Alignment, Terminal Reservoir, Carmel Valley Pump Station, Ryan Ranch-Bishop Interconnection Improvements, Main System-Hidden Hills Interconnection Improvements, and staging areas.

Mitigation Measure 4.6-1n: Habitat Mitigation and Monitoring Plan.
Cal-Am shall develop and submit a Habitat Mitigation and Monitoring Plan (HMMP) to the appropriate resource agencies (CCC, CDFW, CCRWQCB, USACE, USFWS, and local agencies that require a habitat mitigation and monitoring plan) for approval prior to Project construction. The HMMP will be a comprehensive document that will describe all of restoration and compensatory mitigation requirements, including the required performance standards, identified in

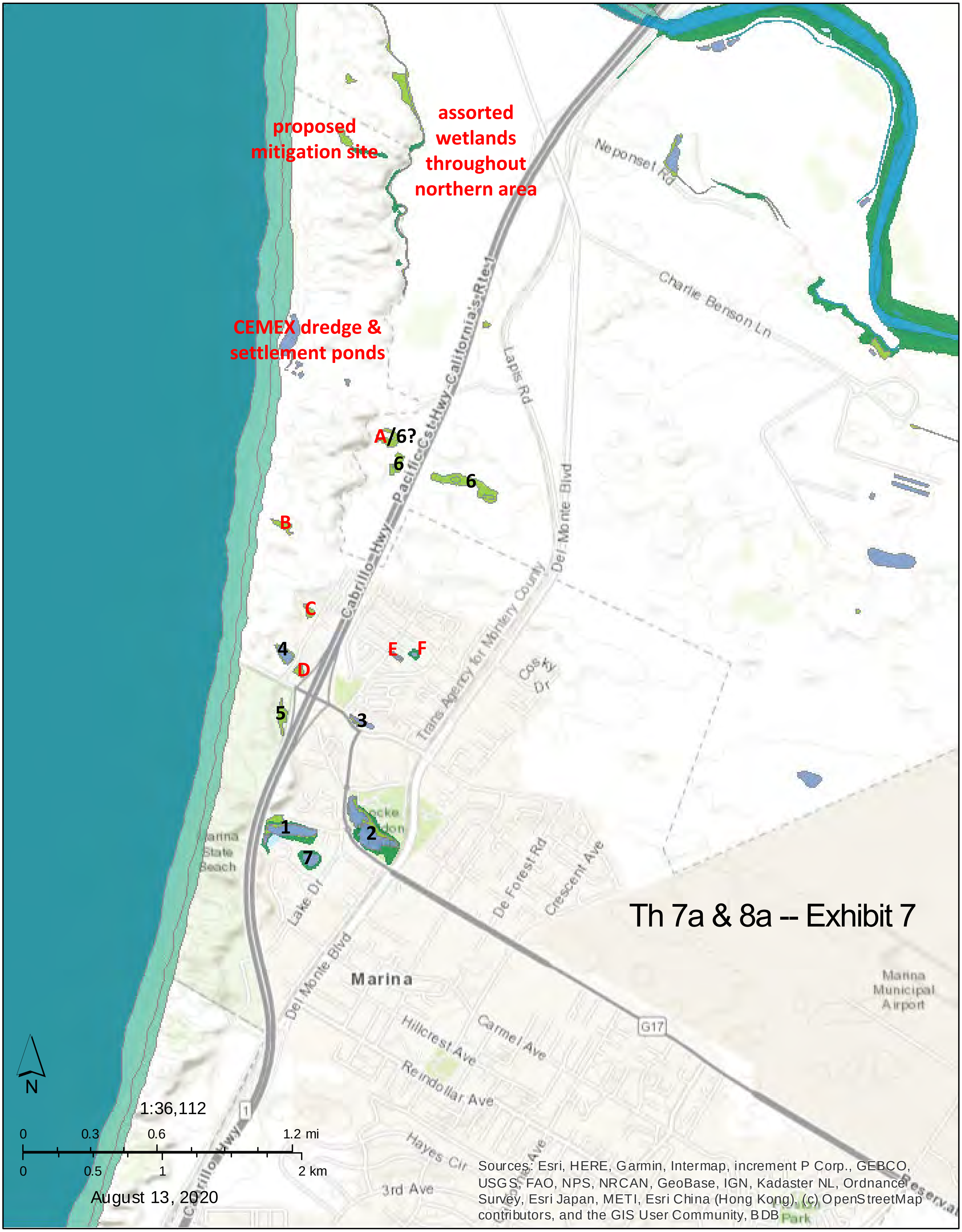
- Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover,
- Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants,
- Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith’s Blue Butterfly,
- Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl,
- Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine,
- Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander, and
- Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.

The HMMP shall be implemented at all areas where special-status species habitat or sensitive natural communities will be restored, created, or enhanced to mitigate for Project impacts either prior to, concurrently with, or following Project construction, as specified in the HMMP. The HMMP shall outline measures to be implemented to, depending on the mitigation requirements, restore, improve, or re-establish special-status species habitat, sensitive natural communities, and critical habitat on the site, and shall include the following elements:

1. Name and contact information for the property owner of the land on which the mitigation will take place
2. Identification of the water source for supplemental irrigation
3. Identification of depth to groundwater
4. Site preparation guidelines to prepare for planting, including coarse and fine grading
5. Plant material procurement, including assessment of risk of introduction of plant pathogens through use of nursery-grown container stock vs. collection and propagation of site-specific plant materials, or use of seeds
6. Planting plan outlining species selection, planting locations and spacing, for each vegetation type to be restored
7. Planting methods, including containers, hydroseed or hydromulch, weed barriers and cages, as needed
8. Soil amendment recommendations

9. Irrigation plan, with proposed rates (in gallons per minute), schedule (i.e., recurrence interval), and seasonal guidelines for watering
10. Site protection plan to prevent unauthorized access, accidental damage and vandalism
11. Weeding and other vegetation maintenance tasks and schedule, with specific thresholds for acceptance of invasive species
12. Performance standards by which successful completion of mitigation can be assessed in comparison to a relevant baseline or reference site, and by which remedial actions will be triggered; success criteria shall include the minimum performance standards described in Mitigation Measure 4.6-1d: Protective Measures for Western Snowy Plover, Mitigation Measure 4.6-1e: Avoidance and Minimization Measures for Special-Status Plants, Mitigation Measure 4.6-1f: Avoidance and Minimization Measures for Smith's Blue Butterfly, Mitigation Measure 4.6-1h: Avoidance and Minimization Measures for Western Burrowing Owl, Mitigation Measure 4.6-1m: Avoidance and Minimization Measures for Native Stands of Monterey Pine, Mitigation Measure 4.6-1o: Avoidance and Minimization Measures for California Red-legged Frog and California Tiger Salamander and Mitigation Measure 4.6-2b: Avoid, Minimize, and Compensate for Construction Impacts to Sensitive Communities and Environmentally Sensitive Habitat Areas.
13. Monitoring methods and schedule
14. Reporting requirements and schedule
15. Adaptive management and corrective actions to achieve the established success criteria
16. Educational outreach program to inform operations and maintenance departments of local land management and utility agencies of the mitigation purpose of restored areas to prevent accidental damages
17. Description of any other compensatory mitigation in the form of land purchase, establishment of conservation easements or deed restrictions, contribution of funds in lieu of active restoration, or purchase of mitigation bank credits, or other means by which the mitigation site will be preserved in perpetuity.

Map of Project Area



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October 22, 2019

TO: Tom Luster, Energy Unit, Sr. Environmental Scientist

FROM: Lesley Ewing, Technical Services Unit, Sr. Coastal Engineer

SUBJECT: CalAm Monterey Peninsula Water Supply Project

This memo addresses some of the hazard issues related to the CalAm Monterey Peninsula Water Supply Project, specifically related to the hazards of erosion and storm damage at the well sites, and related to the possible migration of dunes into the well site that could cover or bury some of the wells. My main conclusions, discussed further in this memo are:

By 2040: The Test Well Site and the Proposed Slant Well Field will be safe from dune erosion and storm-related erosion through 2040.

By 2060: The Test Well Site will be safe from dune erosion through 2060, but, depending upon assumptions for future dune retreat rates, this site could be at risk from storm related erosion from a 100-year storm or greater, between 2040 and 2060. The Proposed Slant Well Field will be safe from dune erosion through 2060, as well as from storm related erosion from up to a 500-year storm.

By 2120: The Test Well and the Proposed Slant Well Field will be at risk from dune erosion with an Extreme Risk Adverse Sea Level Rise Scenario with or without a storm event and from Medium High Risk Aversion Sea Level Rise dune erosion with a 100-year or greater storm. In addition, the Test Well will be at risk from erosion related to all Sea Level Rise Scenarios with a 100-year or greater storm and, from dune erosion without a storm for all scenarios except the Low Risk Aversion Sea Level Rise Scenario.

Risks from Burial due to Inland Dune Migration and Profile Shifts: The Test Well and the Proposed Slant Well Field could be at risk from sand burial resulting from the overall dune response to rising sea level and inland migration and elevation of the profiles. The time period for such risk cannot be determined; however, risks of burial should be low through 2040 and increase over time.

In preparing this memo, I have reviewed the following:

- ESA Memorandum to Michael Burns and Eric Zigas from Elena Vandebroek, David Revell and Doug George, March 19, 2014, Use of Coastal Erosion Technical Memorandum Titled, Analysis of Historic and Future Coastal Erosion with Sea Level Rise.
- ESA Memorandum to "Insert to Appendix C2. Draft Environmental Impact Report/Environmental Impact Statement" July 21, 2016, Use of Coastal Erosion Technical Memorandum Titled, Analysis of Historic and Future Coastal Erosion with Sea Level Rise dated March 19, 2014.
- AECOM Memorandum to Tom Luster from John Chamberlain (AECOM), October 2, 2019, Updated Coastal Erosion Hazard Analysis for CalAm Monterey Peninsula Water Supply Project.

INTRODUCTION and BACKGROUND The general location of the Test Well and the Proposed Slant Well Field is an area of high dune erosion. Historically, this section of the Northern Monterey shoreline has had some of the highest erosion rates in the state, with projections of general retreat of 300' to 320' by 2060, and additional storm-related retreat up to 130', based on historic trends and storm response. (ESA 2014 and 2016). Based on the initial evaluation of erosion risks by ESA (2014), the Proposed Test Well and the Proposed Slant Well Field were relocated several hundred feet inland of the originally proposed locations.

Three reports of site conditions and anticipated site changes were developed for this project. The initial report by ESA (2014) examined changes to the overall dune areas at 7 locations – Moss Landing, Sandholdt Road, Potrero Road, Southern Cluster at CEMEX, Northern Cluster at CEMEX, Sand City and Del Monte; with the information for the Southern and Northern Cluster at CEMEX used for the siting of the Test Well and the proposed siting of the new Well Field. Retreat rates for these sites were projected, based upon historic information, assumed rise in sea level above 2012 levels of 15" by 2040 and 28" by 2060, and conditions with and without erosion from a 100-year storm event.

The ESA Report (2014) projected long-term retreat rates for the various study sites ranging from 65' to 320' by 2060 and additional 100-year storm-related retreat that ranged from 40' to 140'. The two CEMEX sites had both the highest rates of long-term erosion and also the highest retreat related to a 100-year storm event. Comparison between the northern cluster CEMEX location and the southern cluster CEMEX location found that both long-term retreat and storm-related retreat were slightly lower at the southern cluster CEMEX location. Figures 1 and 2 show the anticipated retreat rates for 2040 and 2060, with and without a 100-year storm for both of the CEMEX sites.

By 2016, the proposed Test Well site and the Well Field had been relocated several hundred feet inland of the areas examined initially in the 2014 ESA report. ESA prepared a one-page memo noting that the "proposed locations of some project components have been relocated. The result of the coastal erosion study are still applicable because the change in project component locations does not change the coastal erosion anticipated to occur in response to sea level rise." Using the 2014 ESA study with the new well locations, the test well site is inland of the long-term erosion by both 2040 and 2060; however, the test well site was within the area that could be at risk from erosion between 2040 and 2060 resulting from a 100-year storm or greater. The Well Field area would be inland of all erosion risks analyzed by the 2014 ESA report.

In 2019, AECOM prepared an update to the ESA reports (2014 and 2016). The AECOM report expanded upon the ESA analysis in several ways. It provided shoreline change (dune retreat) analysis for three different Sea Level Rise Scenarios, the Low Risk Aversion, the Medium High Risk Aversion and the Extreme Risk Aversion Scenarios, based on information from the 2018 California Ocean Protection Council Sea Level Rise Guidance (also adopted by the California Coastal Commission). In addition to examining risks for 2040 and 2060, AECOM also included analysis for 2120 and added in likely storm-related retreat from both a 100-year storm and a 500-year storm. AECOM also modified the erosion rates developed by ESA (2014 and 2016) to account for the closure of the CEMEX sand mine. The AECOM analysis reduced the erosion rates by 60%, based on a 2012 analysis from ESA that analyzed the likely benefits to the regional shoreline from closure of the CEMEX plant.

For the 25 to 40 year period of concern, the main changes that AECOM undertook were the addition of 500-year storm condition and the reduction in the erosion rate. The inclusion of the 500-year storm is precautionary; however, the changes to the retreat rates are not. The 500-year storm was included to cover possible extreme conditions, yet several studies[1] anticipate that storm severity and frequency will increase with future climate change, making the 500-year event a far more likely severe storm in the future than it is considered to be today. Thus the 500-year storm is an appropriate one to include for future changes in dune retreat since it might more closely approximate the 100-year event of the 2050s or 2060s. However, the reduction in erosion by 60% assumed a rapid and large response to the closure of the CEMEX mine. While improvements in shoreline change and reductions in dune retreat are anticipated and will be quite welcome in helping stave off the adverse effects from rising sea level, the 60% assumption might be high. The prior retreat analysis by ESA (2014 and 2016) can provide an upper bound to the anticipated retreat through to 2060 since these were developed under the assumption that the CEMEX mine would not be closed and modifications to the retreat rates were not used.

EROSION RISKS AT THE TEST WELL SITE: The current Test Well site has been located inland of the anticipated 2040 long-term dune retreat area as well as the 2040 long-term retreat area with added storm-related retreat from a 100-year storm. This is the case for the projected erosion from ESA (2014 and 2016) as well as from AECOM (2019). However, but 2060, the Test Well site could be at risk from long-term erosion with added storm-related retreat from a 100-year or greater storm. Using the unmodified retreat rates from ESA (2014 and 2016) the Test Well site could be at risk from long-term erosion and a 100-year or greater storm sometime in the period between 2040 and 2060. Using the AECOM modified erosion rates, the Test Well site would not be at risk till sometime between 2060 and 2120 for all but the lowest sea level rise related long-term erosion. By 2120, the site would be at risk from long-term erosion with a 100-year or greater storm for the Low Risk Aversion Sea Level Rise scenario, and from long term erosion with or without a 100-year or greater storm for the Medium High Aversion and the Extreme High Aversion Sea Level Rise Scenarios. Based on the combined analyses by ESA (2014 and 2016) and by AECOM, the Test Well site will be safe from long-term erosion through 2060 and storm-related erosion through 2040. Depending upon the reduction in future erosion from current trends that include the effects from sand mining, the Test Well site might be at risk from storm related erosion between 2040 and 2060.

EROSION RISKS AT THE WELL FIELD SITE: The proposed Well Field will be sited inland at a sufficient distance to protect the site from long-term erosion and storm related erosion through 2060, with either historic erosion trends or erosion modified to reflect the benefits from closure of sand mining at the CEMEX site. Beyond 2060, the Well Field site will be increasingly vulnerable to erosion with the greatest vulnerabilities from the Extreme Risk Aversion Sea Level Rise Scenario, and the 500-year storm event. The Well Field site will be safe for more of the period from 2060 to 2120 with the Low Risk Aversion or Medium High Risk Aversion Sea Level Rise Scenarios and with higher frequency storm events (those more frequent than the 100-year or 500-year events).

RISKS OF BURIAL AT THE TEST WELL AND WELL FIELD SITES. With erosion and rising sea level, unarmored dune-beach profiles are expected to migrate inland and to shift up in elevation. As noted in the ESA reports (2014 and 2016), changes from rising sea level were addressed in two ways. "The

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[1] See, for example, the 2019 IPCC Report, IPCC, 2019: Summary for Policymakers. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. Weyer (eds.)]. In press. https://report.ipcc.ch/srocc/pdf/SROCC_SPM_Approved.pdf

profiles were shifted horizontally inwards by the projected erosion and raised by the projected sea level rise. The existing dune elevations were held as maximums even though the profile shift would imply dune 'growth' in some locations. .... (M)ost of Monterey Bay shore is receding landward, erosion is cutting into relict dunes, and the steep dune faces and narrow beaches impede dune growth (Thornton et al 2006). Dune migration and other changes have not been modeled and dune elevations may change whether the shore is accreting or eroding due to change in vegetation, other disturbance, etc." Thus, there is uncertainty about how the inland portion of the dunes will change. There is also uncertainty about how far inland the dune profile changes will occur, and also about the time periods over which these changes will occur. Changes to the dune face might take some time before these changes are reflected fully in the entire dune profile.

None of the reports from ESA or AECOM examined the risks to the site from sand burial. Sand burial has been included in this memo since burial might require maintenance of the well sites beyond what might have been considered, and might lead to impacts to the surrounding area. The analysis relies upon assumptions and work already developed by ESA and AECOM. No modeling of the back profile has been done and the potential for burial is covered only in general terms.

With the general changes that would be expected with rising sea level, that the profiles would shift up at an amount equal to the rate of sea level rise, it can be expected that the dune profile at the Test Well and at the Well Field site would eventually experience 15" to 28" of increased dune elevation in the form of sand cover. Due to the anticipated lag, the sand elevation would not necessarily be 15" higher at 2040 or 28" higher at 2060 (using the sea level rise projections from the ESA report); however, some added sand cover would be likely to occur over the project life. This is likely to be experienced both at the Test Well Site as well as at the Well Field Site, although the changes at the Well Field site from the rise in sea level are likely to occur later than at the Test Well site due to their greater setback from the active dune face. See Figures 3 and 4 for locations of the Test Well and the Well Field relative to the dune system.

The shift of the full profile inland with erosion is likely to cause greater changes at the Well Field Site than at the Test Well Site. The dune profile at the Test Well site has only small changes in topographic relief. An inland shift in the profile is thus likely to result in only small changes in topographic relief, either from increased sand cover or a loss of sand. However, at the Well Field site, the wells would be about 110' inland of the high dunes and the Well Field Site is about 12' to 15' lower than the more seaward dunes. With a long-term retreat at this site by 2060 ranging from 300' (from ESA, 2014 and 2016) to 120' (as modified by AECOM), the profile shift could potentially start to add sand cover to the Well Field by 2040 with the long-term erosion assumptions from ESA (2014 and 2016) or by 2050 or 2060 with the long-term erosion retreat as modified by AECOM. Since the full profile shift is not likely to be instantaneous with the long-term erosion at the face of the dune, the period for active burial of the well is not likely to start until 2040 or after. The potential for burial of the Well Field site increases from 2040 to 2060 and beyond; the potential for sand burial will depend upon both the future retreat of the dune face and the lag between the changes to the dune face and the full dune profile.

<u>CONCLUSIONS</u>: The changes made by AECOM to add in a greater than 100-year storm event are useful for the analysis since such storms are likely to be more frequent in the future with changes in sea level and climate. The changes made by AECOM to the retreat rate to account for benefits from closure of the CEMEX sand mine may anticipate less long-term erosion of the dunes that might actually occur. As a result, the work from ESA (2014 and 2016), which assumes no reduction from historic erosion, has been

included to provide a reasonable upper bound for erosion risks to the Test Well site and the Well Field site. With the ESA analysis included, the Test Well site might be at risk from large storms and long-term erosion between 2040 and 2060.

None of the analyses by ESA or AECOM looked at the risks to the sites from sand burial. While there are many unknowns related to the actual shifts in the full dune profile over time and whether there would be a lag between the response of the frontal dune area and the back dune area, it is possible that there could be some burial of the well sites, both from sea level rise causing an elevation of the dune profile, and from an inland shift in the dune profile due to erosion. The Test Well site is likely to experience the greatest risk from burial (up to 1' to 2') due to the elevation of the profile with rising sea level. The Well Field is likely to be a greatest risk of burial from an inland shift in the dune profile. The timing of this risk would depend mainly upon the future rate of sea level rise, the future area of dune retreat and the time lag between a change in the dune face and the inland profile.

Overall, no appreciable erosion risks are anticipated to occur at the Test Well or the Well Field areas by 2040. There are small risks to the Test Well Site from storm-related erosion between 2040 and 2060. There are also small risks to the Test Well Site and the Well Field Site from possible sand burial that would be minimal through 2040. There is a small chance that the Well Field site might experience several feet of sand burial between 2040 and 2060. Beyond 2060, it becomes more likely that significant burial would occur.

MEMO EXHIBITS

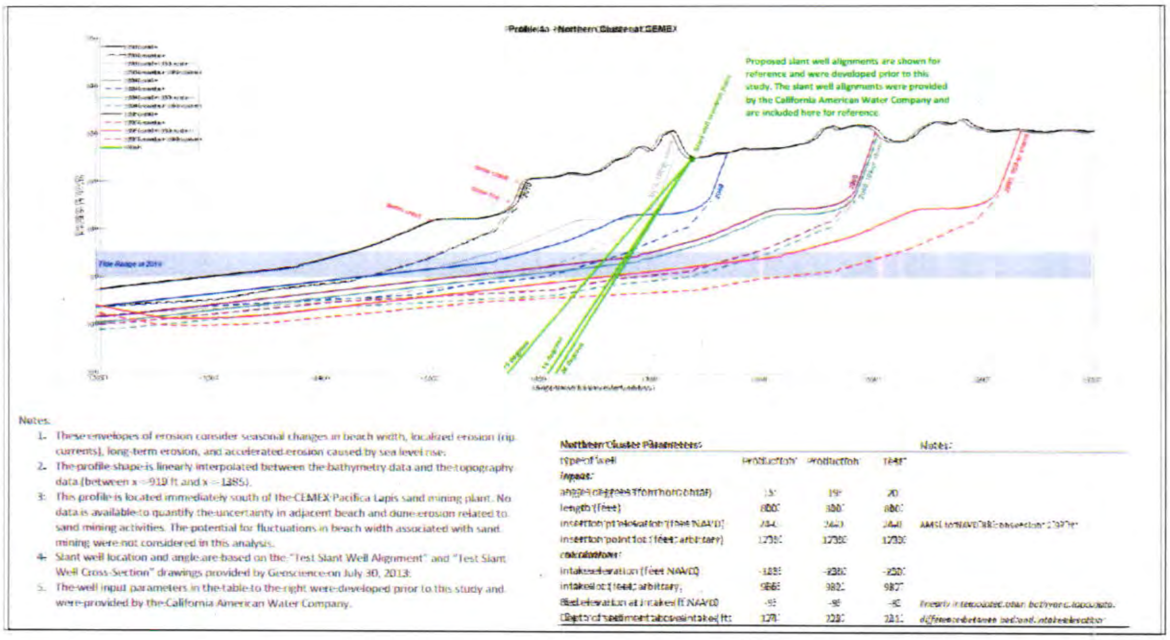


Figure 1, Retreat at the Northern Cluster CEMEX, From 2014 Report by ESA

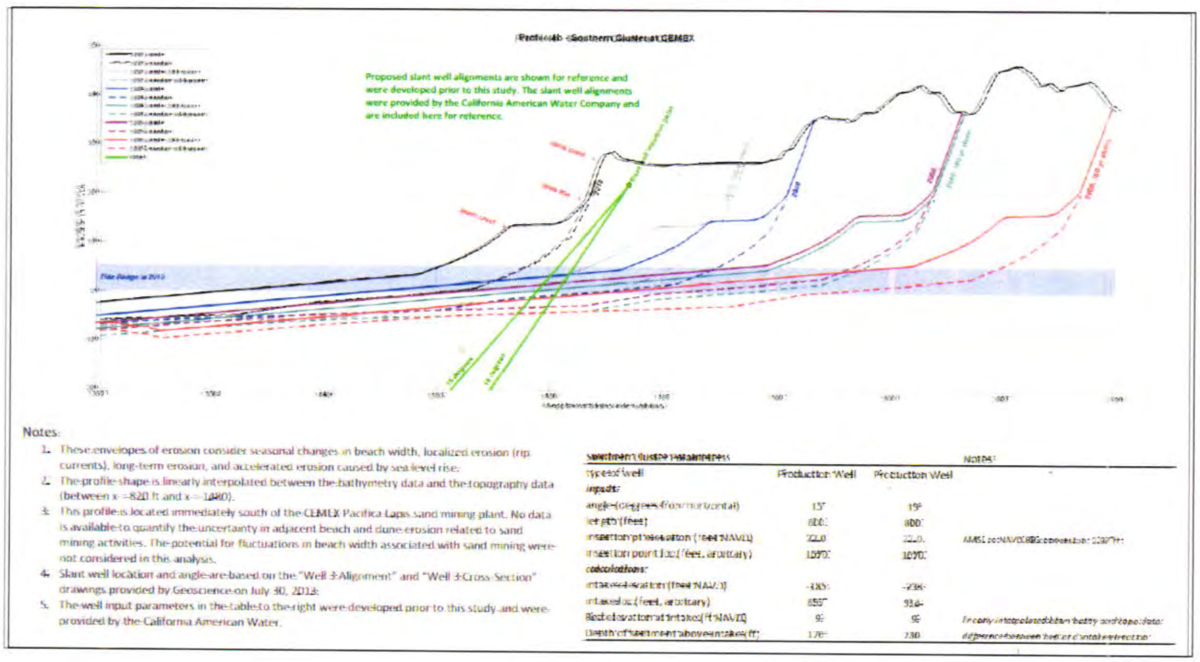
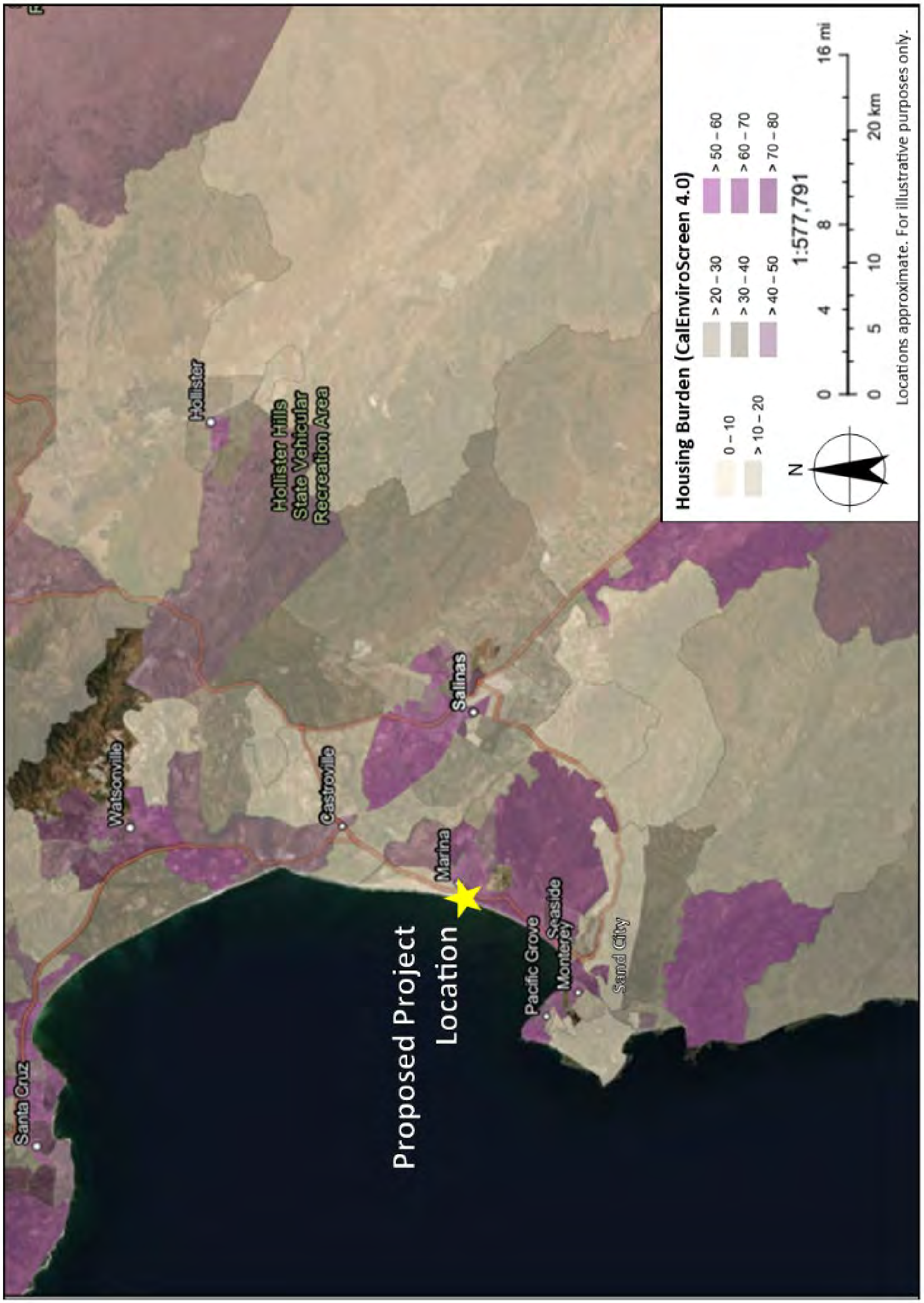


Figure 2, Retreat at the Southern Cluster CEMEX, From 2014 Report by ESA



Source: CalEnviroScreen 4.0 Housing-Burdened Indicator. Higher numbers reflect higher burden.

Th7a & 8a – Exhibit 9: Map of Housing-Burdened Households

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October 17, 2022

VIA EMAIL

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603 & Appeal No. A-3-MRA-19-0034: Proposed Contribution for Public Improvements in the City of Marina

Dear Tom:

We are writing to provide Coastal Commission staff with an update on California American Water's Monterey Peninsula Water Supply Project (MPWSP) based on input from the community received over the last several months. As you know, California American Water proposes to construct and operate slant wells on the former CEMEX industrial mining site located within the City of Marina, California. While the California Public Utilities Commission identified the CEMEX site as the least environmentally impactful location for the slant wells following its six-year environmental review process, California American Water recognizes that Marina residents may be burdened by potential impacts due to the construction and operation of the slant wells within city limits. We also acknowledge that the City currently will not receive any desalinated water from the MPWSP. Although physical impacts to the environment from the slant wells will be mitigated to the maximum extent feasible, California American Water also understands that the presence of the slant wells within the City of Marina must properly be considered in light of the Commission's Environmental Justice Policy.[1] To that end, California American Water has engaged with the community to learn what improvements within the City of Marina are desired by City residents. Having received input from the community, California American now proposes a contribution of $1 million to be used for public improvements within the City, as described in more detail below.

[1] The Commission's Environmental Justice Policy states:

> The Commission will use its legal authority to ensure equitable access to clean, healthy, and accessible coastal environments for communities that have been disproportionately overburdened by pollution or with natural resources that have been subjected to permanent damage for the benefit of wealthier communities. Coastal development should be inclusive for all who work, live, and recreate on California's coast and provide equitable benefits for communities that have historically been excluded, marginalized, or harmed by coastal development.

Th 7a & 8a -- Exhibit 10

California American Water has previously attempted to engage in meaningful dialogue with the City of Marina concerning potential benefits to the City and its residents. In late 2020 and early 2021, we reached out to City officials and offered a variety of benefits, including a franchise or similar agreement with the City to provide funding for City needs, funding for Western Snowy Plover protections, enhanced fire flows and potable water supplies, and options for MPWSP participation through ownership of one or more source water wells or portions of desalination facilities. To date, City officials have declined these proposals.[2]

Nevertheless, in the past several months California American Water has reached out to the community directly, conducting multiple workshops with Spanish translation available at locations convenient to City residents, presentations to interested groups, and information stands at the local farmers market on successive weekends to talk to City residents about the MPWSP and to learn about desired improvements that could benefit the City. California American Water has also asked workshop attendees to complete a survey to provide their thoughts and suggestions on the types of benefits they would like to see. The survey was also distributed to those who have provided California American Water with their contact information. Two priorities that were frequently raised during our discussions with City residents and on the survey responses are (1) coastal access and facilities, and (2) park improvements. While California American Water is unable to provide a new supply of desalinated water to Marina residents without the City's participation, we are willing to contribute funding to ensure equitable access to clean, healthy, and accessible coastal environments.

California American Water therefore proposes, as part of the MPWSP, that $1 million in funding be provided, to be used for improving public access, public facilities and recreational opportunities, and restoration within the City. Further community engagement would be conducted by a third party to identify precisely how the community would like to see funds used. The funds would be provided to a state or local entity to hold and oversee distribution to ensure that the community's voice is heard. California American Water would like to work with Commission staff to develop a public outreach process that would be implemented to identify the community benefits to be funded. We also would like to work with staff to define the process by which the funds are distributed to ensure the community benefits ultimately identified through this outreach process receive appropriate funding.

One possible location where these funds could be used to make the types of improvements identified so far through California American Water's outreach efforts is the Marina Dunes Preserve, located in the City of Marina just south of the CEMEX site. The Monterey Peninsula Regional Park District (the "Regional Park District") purchased the site, an abandoned former sand mining site with off-road vehicle damage, in 1988 to enhance and protect public access to the Monterey Bay seashore and restore native vegetation to the site to more natural habitat conditions. Although the Regional Park District has been slowly restoring the site since 1990, there is much additional work to be done, and the Regional Park District has informed California American Water that funding is needed to carry out its intended

[2] More recently, on September 19, 2022, California American Water requested a meeting with the City's Mayor to further discuss potential benefits to the City from the MPWSP. We have yet to receive a meaningful response with available dates for a meeting, and our proposals so far have been dismissed. Nevertheless, California American Water remains open to discussions with City officials.

improvements. Importantly, the Regional Park District also plans community engagement to further define its activities.

Our proposed contribution would address certain needs identified through our engagement with the community, and additional outreach is anticipated to further refine how the funds are spent. While California American Water remains open to discussing other potential benefits with City of Marina officials, we believe that community input is invaluable in evaluating how the MPWSP can benefit the City. We appreciate staff's consideration of the MPWSP and look forward to working with staff to develop the appropriate process to ensure our proposed contribution satisfies the community's needs. Please don't hesitate to contact us should you have any questions.

Sincerely,

Ian Crooks
California American Water Company

cc: Kate Huckelbridge, California Coastal Commission
Noaki Schwartz, California Coastal Commission
Kathryn Horning, California-American Water Company
DJ Moore, Latham & Watkins LLP
Winston Stromberg, Latham & Watkins LLP

- **Project Changes and Benefits in Response to Community Concerns:** Based on feedback CalAm has received from the community and ratepayers, CalAm has proposed several significant changes to the MPWSP, including additional community benefit proposals.

    - In response to community concerns about the MPWSP's size and the need for the water it will produce, CalAm has proposed to phase the MPWSP's development. Under this proposal, CalAm initially would build a reduced slant well network that would support a desalinated water production capacity of approximately 4.8 million gallons of water per day ("mgd") – which would provide about 4,000 acre-feet of water per year – with the ability to add slant well infrastructure in the future to increase the capacity up to 6.4 mgd. CalAm would not be able to expand unless certain thresholds that demonstrate a need for additional water have been satisfied.

    - In response to community concerns that CalAm needs to provide benefits to Marina residents since the MPWSP's slant wells will be located on the CEMEX site in the City of Marina, and that the project should be restoring coastal resources and improving coastal access for the community, CalAm has proposed to dedicate $1 million to be used for public improvements within the City of Marina. CalAm has proposed to collaborate with Commission staff to develop a public outreach process to identify the specific community benefits to be funded. One potential location where these funds could be used is the Marina Dunes Preserve, just south of the CEMEX site. The Monterey Peninsula Regional Parks District has been restoring the site, but needs additional funding to carry out the improvements.

    - In response to community concerns about the increased cost of water from desalination, CalAm has proposed seeking CPUC approval of up to seven different programs that would benefit low-income customers who qualify for CalAm's Customer Assistance Program, with the goal of ensuring that desalinated water does not increase those customers' water bills. For example, CalAm is proposing to increase the current discount on those customers' bills from 30 percent to 50 percent. In addition, CalAm has proposed an additional contribution of up to $500,000 to the United Way Monterey's Hardship Benefit Program, which uses those funds to pay the water bills of low income customers who have received water shut-off notices.

Principle No. 3 – Coastal Access.

- **Phased Project Design:** Under the phased project design, the MPWSP's slant wells and access road would occupy an even smaller area – less than 2 acres on the 400+ acre CEMEX site, thereby reducing potential impacts to coastal access.

- **Public Access Plan:** CalAm has proposed a Public Access Plan that is designed to provide new opportunities for public access across the CEMEX site's dunes and to the beach, where there currently is no access. Proposed improvements include pedestrian pathways and access to the beach, overlook and rest areas, wayfinding and interpretive signage, and other amenities located primarily on CalAm's existing easement area.

Principle No. 4 – Housing.

- The new water supply the MPWSP will provide is necessary to lift the current moratorium on new water connections that has been in place since 2009.

- With the moratorium lifted, water from the MPWSP will enable the development of needed affordable housing identified under the Regional Housing Needs Assessment (RHNA). New affordable housing on the Peninsula would reduce housing pressures in Salinas and other areas of concern and would reduce traffic from workers who must travel through the region to reach Peninsula jobs.

Principle No. 5 – Local Government Engagement.

- Cal-Am has continued to work with local governmental agencies throughout the MPWSP permitting process. CalAm has presented the MPWSP to multiple local governments – including the Marina City Council, Sand City City Council, Pacific Grove City Council, and Seaside City Council. CalAm also plans to present to the Salinas Valley Groundwater Basin Groundwater Sustainability Agency on October 26.

    - In addition, the City of Marina considered the MPWSP at a multi-hour public hearing before the City's Planning Commission on February 14, 2019. The MPWSP also was considered and approved by the Monterey County Board of Supervisors.

- Separately, CalAm has had multiple meetings with the City of Marina Mayor and certain City Councilmembers to discuss their concerns and see if there is a mutually agreeable path forward. City officials have rejected CalAm's offers to make various enhancements or modifications to the MPWSP. Although the City has been unwilling to collaborate with CalAm, CalAm remains open to discussing these potential benefits, which include:

    - A franchise agreement or similar agreement with Marina, subject to state laws, in which CalAm would make annual payments to Marina based on a to-be-agreed-upon formula, such as revenue generated by MPWSP assets located within City limits.

    - Enhancements to existing mitigations by providing long-term funding to Point Blue to monitor, protect, and provide expert guidance on the Western Snowy Plover, along with funding for long-term preservation.

    - Enhanced fire flows to Marina via either standalone fire hydrants or emergency inter-ties along the transmission water main that is located within City limits.

    - Potential optioning or selling to Marina one or more source water wells and/or desalination treatment trains.

- Providing source water or portable water to Marina on an emergency, short-term, or long-term basis.

Principle No. 6 – Participation in the Process.

- CalAm has made every effort to make public notice of community workshops available in both English and Spanish through a variety of media and provides Spanish translation services at every workshop. CalAm publicized these workshops via newspaper ads in the three largest local newspapers, bilingual radio ads, bilingual flyers, bilingual social media, and bilingual email blasts – copies of which have been provided to Commission staff. CalAm also has translated its Community Questions and Responses document into Spanish, Vietnamese, and Korean.

- Additionally, CalAm has held workshops in a number of different cities and at various locations to minimize community members' travel and to accommodate differing schedules.

- Further, CalAm has used online surveys, sent out emails and physical mailers, and directly contacted community organizations via phone and email to increase public participation and input.

Principle No. 7 – Accountability and Transparency.

- CalAm understands that staff has had questions about the MPWSP's impacts on communities of concern, particularly the Cities of Marina and Seaside. CalAm has engaged those communities and others, such as the underserved community of Castroville, to hear the communities' concerns and find ways to enhance the MPWSP in response, as described above.

- CalAm has provided staff with weekly updates on its outreach efforts, including copies of outreach materials.

- Finally, as part of its Outreach and Engagement Plan, CalAm has proposed post-operational community outreach to ensure the public can remain engaged and informed about project operations and address groundwater concerns.

Principle No. 8 – Climate Change.

- The MPWSP will ensure that the Monterey Peninsula will have access to sufficient and reliable water sources even during droughts precipitated by climate change. Although CalAm is committed to purchasing recycled water from the Pure Water Monterey project and its expansion, there are concerns about the vulnerability of the Pure Water Monterey's source waters to climate change and prolonged droughts. Further, the Seaside Groundwater Basin is at risk of seawater intrusion that could be exacerbated by inland groundwater pumping during droughts. Thus, the MPWSP is needed to provide a reliable, drought-proof water supply for the region.

- CalAm has extensively reviewed the Commission's sea level rise guidance and evaluated the effects of the most extreme sea level rise scenarios on the MPWSP. Expert technical analyses submitted to Commission staff demonstrate that even under the worst case scenario, the MPWSP will not be impacted by sea level rise or coastal hazards through 2120 for the new slant wells and 2060 for the existing test slant well. Nonetheless, CalAm has proposed a 25-year permit duration and agreed to reassess sea level rise and coastal hazards at the CEMEX site prior to permit expiration as part of a permit amendment application.

Principle No. 9 – Habitat and Public Health.

- **Habitat Creation and Restoration:** The CPUC extensively reviewed the MPWSP's potential impacts to coastal resources and ecosystems and ultimately determined that the MPWSP would not result in a substantial negative physical impact to terrestrial biological resources with the implementation of mitigation. Nonetheless, CalAm is committed to preserving and enhancing Marina's coastal resources and has proposed to create new dune habitats and restore existing habitat throughout the Peninsula.

    - **<u>Dune Creation</u>:** CalAm has proposed to provide approximately 2.25 acres of dune creation as mitigation for areas where the MPWSP has permanent development located in Coastal Dune (e.g., the MPWSP's slant well pads and access road). CalAm has identified a number of options – including in Sand City, a community of concern – that would be feasible to create 2.25 acres of dune habitat.

    - **<u>Habitat Restoration</u>:** In addition to dune creation, CalAm would fully mitigate for the MPWSP's impacts to ESHA at a 1.5:1 ratio for long-term temporary impacts and a 3:1 ratio for substantial restoration of permanent impacts, consistent with established Coastal Commission precedent. Maximum potential substantial restoration would be up to approximately 95 acres, which includes the restoration that would occur along the MPWSP's pipeline route. CalAm has proposed a number of feasible sites in the region where restoration activities could occur, including on the CEMEX site in Marina

- **Minimal Marine Life Impacts:** CalAm proposes to subsurface intake slant wells to withdraw seawater from beneath the seafloor. The State Water Resources Control Board has identified subsurface intake technology as the preferred technology for desalination facilities because it minimizes potential impacts to marine life.

- **Benefits to the Carmel River:** The MPWSP would allow CalAm to reduce its reliance on the Carmel River and ensure that CalAm has a diverse portfolio of non-River water supplies in the event other water supply sources fall short. Further, reduced withdrawals from the Carmel River would allow more water to remain in the River, providing substantial benefits to threatened species and their critical habitat, as well as numerous other species and the river watershed as a whole.

- **Discounted Water to Castroville:** The MPWSP would benefit the community of Castroville, an underserved agricultural community in Monterey County whose main source of drinking water is the underlying groundwater aquifer system that has been degraded by seawater intrusion. As part of the MPWSP, CalAm would provide potable water at a discounted rate to Castroville that represents Castroville's avoided costs to produce groundwater.

- **Seawater Intrusion Prevention:** The MPWSP would prevent further seawater intrusion into the Salinas Valley and Seaside Groundwater Basins because it would intercept and withdraw seawater that is migrating inland.

Principle No. 1 – Respecting Tribal Concerns.

- **Government-to-Government Consultation:** In preparing the MPWSP's Environmental Impact Report/Environmental Impact Statement ("EIR/EIS"), the California Public Utilities Commission ("CPUC") and Monterey Bay National Marine Sanctuary contacted the Native American Heritage Commission ("NAHC") and consulted with NAHC-identified Native American tribal governments that may be affected by MPWSP. (See, e.g., EIR/EIS, p. 4.15-18.) Coastal Commission staff similarly conducted tribal outreach leading up to its release of the August 25, 2020, Staff Report. (2020 Staff Report, p. 27.)

- **CalAm Outreach:** CalAm also has conducted outreach to and held meetings with Tribal representatives.

    - On July 21, 2022, CalAm invited Tribal representatives to an in-person meeting at Sand City City Hall, which lasted for over two hours. Meeting attendees, which included Mary Ann Carbone from the Chumash Tribe, Patrick Orosco from the Pajaro Valley Ohlone Indian Council and Tom "Little Bear" Nason from the Esselen Tribe, expressed concern about the health of the Carmel River and asked questions regarding the MPWSP's potential environmental impacts. The attendees expressed their support for the MPWSP because it would (a) help ensure long-term reduction in CalAm's withdrawals from the Carmel River and restoration of its ecosystems; and (b) use slant well technology that would avoid potential marine life impacts in Monterey Bay. CalAm is currently in the process of organizing a follow-up meeting with Tribal representatives with the assistance of Sand City Mayor Mary Ann Carbone.

    - CalAm has been in regular contact with Tom "Little Bear" Nason regarding the MPWSP, and most recently discussed CalAm's phased MPWSP proposal at the beginning of October.

    - In October, CalAm received two letters of support for the MPWSP from Mary Ann Carbone of the Chumash Tribe, and the Pajaro Valley Ohlone Indian Council.

    - As part of its outreach, CalAm has reached out to the following Tribal representatives and members, including to invite them to the July 21 meeting:

Valentin Lopez, Amah Mutsun Tribal Band	Irenne Zwierlein, Amah Mutsun Tribal Band of Mission San Juan Bautista	Patrick Orosco, Coastanoan Ohlone Rumsen-Mutsun Tribe
Tony Cerda, Costanoan Rumsen Carmel Tribe	Tom Little Bear Nason, Esselen Tribe of Monterey County	Ann Marie Sayers, Indian Canyon Mutsun Band of Costanoan

Louise Miranda-Ramirez, Ohlone/Costanoan-Esselen Nation	Frederick Segobia, Salinan Tribe of Monterey, San Luis Obispo Counties	Gary Pierce, Salinan Tribe of Monterey, San Luis Obispo Counties
Mary Ann Carbone, Chumash Community	Theresa Aldrete, Ohlone People's Federation	Rudy Rosales, Esselen
Karen White, Xolon-Salinan Tribe	Mary Rodgers, Salinan Tribe of Monterey, San Luis Obispo Counties	Yvonne Ayala, Salinan Tribe of Monterey, San Luis Obispo Counties
Leslie Montgomery, Salinan Tribe of Monterey, San Luis Obispo Counties	Kenneth Pierce Sr., Salinan Tribe of Monterey, San Luis Obispo Counties	Sharon Thomas, Salinan Tribe of Monterey, San Luis Obispo Counties
Robert Piatti, Salinan Tribe of Monterey, San Luis Obispo Counties	Michael Woody, Salinan Tribe of Monterey, San Luis Obispo Counties	John Piatti Jr., Salinan Tribe of Monterey, San Luis Obispo Counties
Pamela Flood, Salinan Tribe of Monterey, San Luis Obispo Counties	Don Pierce Jr., Salinan Tribe of Monterey, San Luis Obispo Counties	Dayna Sciocchetti, Salinan Tribe of Monterey, San Luis Obispo Counties
Bruce Flood, Salinan Tribe of Monterey, San Luis Obispo Counties	Yvonne Davis, Salinan Tribe of Monterey, San Luis Obispo Counties	Deanna Perry, Salinan Tribe of Monterey, San Luis Obispo Counties

Principle No. 2 – Meaningful Engagement.

- **Engagement During the CEQA Process:** During the CPUC's six-year review of the MPWSP, the CPUC heard from numerous interested parties and groups representing underserved communities and diverse interests, with many expressing support for the Project, including the Latino Water Coalition, Latino Seaside Merchants, Comunidad en Accion, Monterey County Farm Bureau, and Salinas Valley Water Coalition.

- **Engagement During the Coastal Commission Process:** As part of its consideration of the MPWSP, the Coastal Commission held an informational hearing in November 2019. For this meeting, the Commission provided a live video feed from Marina City Hall, allowing participation of numerous local residents and community groups without having to travel to Half Moon Bay.

- **CalAm Outreach:** CalAm has conducted significant outreach with local communities, including within the Cities of Marina, Seaside, Sand City, and Salinas, the community of Castroville, and a number of interested local organizations. CalAm prepared and shared an Outreach and Engagement Plan with Commission staff to ensure CalAm meaningfully engages various communities and groups in both the short- and long-term.

- **<u>Workshops</u>:** CalAm has held 12 community workshops – 5 in Marina, 3 in Seaside/Sand City, 2 in Castroville, and 2 in Salinas. Another community workshop is scheduled in Marina on October 24. CalAm also has set up a table at the Marina Farmer's Market for the last several weeks.
  - CalAm provided public notice for these workshops via newspaper ads in the three largest local newspapers, bilingual radio ads, bilingual flyers, bilingual social media, and bilingual email blasts.
  - CalAm has made Spanish translation available at the workshops.
  - At the workshops, CalAm discusses topics such as: (1) coastal habitat, groundwater quality and monitoring, and beach access; (2) outreach and engagement; (3) community benefits; (4) affordability; (5) customer service and water conservation; (6) MPWSP design – such as slant well technology – and operations; and (7) the Peninsula's water supply needs.
  - Based on feedback and questions received at the initial workshops, CalAm prepared a Community Questions and Responses document in English, Spanish, Vietnamese, and Korean. This document has been distributed to workshop attendees via email, made available at workshops and meetings in hard copy, and has been posted on the MPWSP website.
- **<u>Targeted Outreach to Organizations</u>:** CalAm prepared an Outreach and Engagement Plan that it provided to Commission staff and included environmental justice, social justice, and community organizations across the Peninsula that CalAm identified through its independent research. Staff made additional suggestions that CalAm added to its Plan, and CalAm has since reached out to dozens of these organizations, focusing in particular on organizations in the City of Marina, to offer a presentation on the Project and solicit input and feedback.
  - In addition, CalAm reached an agreement with the Surfrider Foundation and Planning and Conservation League, among others, concerning MPWSP's discharge of brine into Monterey Bay.
- **<u>Ratepayer Outreach</u>:** CalAm has provided customers with information about the MPWSP, affordability and conservation programs, upcoming workshops, and other opportunities for public input on a weekly basis. This information has been conveyed in English and Spanish via social media posts, newspaper and radio advertisements, and emails. Copies of this outreach have been shared with Commission staff.

CALIFORNIA AMERICAN WATER

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October 27, 2022

VIA EMAIL

Mr. Tom Luster
California Coastal Commission
Energy and Ocean Resources Unit
445 Market Street, Suite 300
San Francisco, CA 94101

Re: Monterey Peninsula Water Supply Project, CDP Application No. 9-20-0603 & Appeal No. A-3-MRA-19-0034: Impact on Customer Rates

Dear Tom:

This letter provides background details of how costs to construct and operate the Monterey Peninsula Water Supply Project Desalination Facilities, which include the source water wells, desalination treatment facility, and desalination conveyance pipelines ("Project"), could impact monthly water bills for average single-family residential customers in California American Water's ("CalAm") Monterey service area. In particular, we have focused on potential impacts to low income customers that qualify for CalAm's Customer Assistance Program ("CAP"). It is important to note that, as a regulated public utility, changes to CalAm's customer rates are subject to a public review and approval process before the California Public Utilities Commission ("CPUC"). Accordingly, the projections presented in this summary are estimates based on current available information, and have not been approved by the CPUC. The CPUC has remained committed to ensuring the affordability of water for low income customers of its regulated utilities, like CalAm, and as discussed below, CalAm is confident the CPUC will approve additional measures to increase water affordability associated with the Project.

I. RATE BACKGROUND

In order to provide future projections, it is first important to understand how CalAm's current base rate system is set up for residential customers. The rates for single-family residential customers fall into four pricing tiers. During each monthly billing period, household water use starts in the first tier, where the price per 100 gallons ("CGL") is the lowest. Each tier has a ceiling on the amount of water allocated to it; if a customer uses more water than the ceiling in a particular tier, additional water consumption falls into the next higher-priced tier. Thus, the tiered rate system rewards customers who conserve water.

The below chart shows CalAm's current tiered rates for the Monterey service area:

Single Family Rates (As of March 4, 2022)		
Tier 1	For the first 29.9 CGL	$1.0475 per CGL
Tier 2	For the next 29.9 CGL	$1.5713 per CGL
Tier 3	For the next 54.5 CGL	$4.1901 per CGL
Tier 4	For all water over 114.3 CGL	$6.2851 per CGL

In addition to the tiered rate structure, all customer bills are subject to various monthly fees, including a monthly meter service charge, which is based on the size of the meter serving the residence, Monterey Peninsula Water Management District user fees, and other surcharges.[1] Based on existing bills, half of CalAm's single-family residential customers have an average monthly bill of approximately $82.85 or less.[2] This half of the customer base typically uses less than 29.9 CGL (i.e., Tier 1) of water on a monthly basis.

II. PROJECTED MONTHLY RATE INCREASE FOR AVERAGE CUSTOMER

In 2020, CalAm estimated to Coastal Commission staff that, based on current information at that time, the average single-family customer's monthly water bill would increase by approximately $37 to $40 as a result of the Project. Since that time, there have been numerous factors outside of CalAm's control that have resulted in further increases to these anticipated rates. For instance, as a result of inflation and other economic reasons, labor costs and materials costs have gone up, increasing overall Project construction costs. Similarly, operation and maintenance ("O&M") costs have increased by about 20% due to inflation (net of lower chemical, power and non-labor costs resulting from a smaller production capacity).

Based on current modeling, CalAm now estimates that the cost of Project construction and operation will result in a monthly rate increase of approximately $47 to $50 for the average single family customer in the Monterey service area.[3] This increase will occur when the Project is put into service.[4] This estimated average rate increase reflects the initial phase of the Project,

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[1] Most single-family residential customers in the Monterey service area are served by a 5/8-inch meter.

[2] To prepare the estimates in this summary, California American Water used customer bills from May 2022, which is historically the month of the year where water use best approximates an annual average.

[3] The Project's projected rate increase consists of three components: (1) a fixed monthly cost for financing construction of the Project using a State Revolving Fund ("SRF") loan; (2) capital expenditures for the Project, which are not financeable through a SRF loan; and (3) ongoing O&M costs for the Project.

[4] The Project is expected to come online in December 2026. This date assumes that if the Coastal Commission approves the Project's coastal development permits in November 2022, California American Water will take up to two years to clear all prior to construction conditions (including securing certain permits from other agencies), followed by 18 to 24 months of construction in the Coastal Zone.

which, as CalAm has proposed to Commission staff, would have a production capacity of 4.8 million gallons per day.

III. LOW INCOME ASSISTANCE PROGRAMS AND RATE RELIEF

CalAm's current CAP provides a 30% discount on monthly bills to qualifying customers.[5] Income guidelines for customer eligibility in the CAP are set forth below:

INCOME GUIDELINES / *REQUISITOS DE INGRESOS*
(Effective June 1, 2022 to May 31, 2023 / *Vigentes desde el 1 de junio de 2022 hasta el 31 de mayo de 2023*)

Number of Persons in Household / *Cantidad de personas en el grupo familiar*	Total Combined Annual Income / *Ingreso anual combinado total*
1-2	$36,620
3	$46,060
4	$55,500
5	$64,940
6	$74,380
7	$83,820
8	$93,260
Each Additional Person, Add / *Cada Persona Adicional, Agregue*	$9,440

In CalAm's current General Rate Case that is pending at the CPUC, we have requested approval to increase this discount from 30% to 35%. Moreover, as we explained in our Low Income Rate Relief Proposals, which we previously provided to Coastal Commission staff, CalAm agreed to seek CPUC approval to raise that discount for the Monterey service area to 50% in connection with construction and implementation of the Project.

As of September 2022, approximately 3,700 customers were enrolled in the CAP in CalAm's Monterey service area. This represents a substantial increase in CAP enrollment as compared to 2020, when only 2,504 customers were enrolled in the program. Based on existing bills, the average CAP customer has a monthly bill of about $65.74 in 2022, inclusive of the current 30% CAP discount. As with all single-family residential customers, the average CAP customer uses less than 29.9 CGL (i.e., Tier 1) of water on a monthly basis.

In 2020, CalAm estimated that with the CPUC's approval of CalAm's proposed increase in the CAP discount to 50% per month, the average CAP customer would have a monthly rate increase of approximately $10 to $12 as a result of the Project. Based on CalAm's updated modeling, as described above, with the 50% CAP discount the average CAP customer would have a monthly rate increase of approximately $14 to $18 as a result of the Project. Notwithstanding that potential increase, and as expressed in our proposed Low Income Rate Relief Proposals, CalAm has committed to the goal of completely offsetting cost impacts from the Project to its low-income customers such that the average CAP customer would experience

---

[5] The discount applies to the monthly meter service charge on every bill as well to rate tiers 1 through 3 (up to 11,430 gallons per month).

no rate increase as a result of the Project. CalAm has proposed seven different programs that would achieve this goal, most of which would require CPUC approval. In addition, if the CAP discount were to be increased to 70%, the average CAP customer would pay no rate increase as a result of the Project (and may even pay less than they would otherwise pay in the absence of the Project and this increased discount).

CalAm understands that Coastal Commission staff is concerned that the CPUC may not approve one or more of CalAm's proposed Low Income Rate Relief Proposals before the Project comes online and rate increases occur. To address such concerns and ensure that increased rates from the cost of desalinated water do not adversely affect low income customers, CalAm has proposed the following Special Conditions for Commission staff's consideration, which (1) will increase the conservation of water for customers in the CAP program, thereby further reducing water consumption and lowering average monthly bill amounts; and (2) ensure that CAP customers are not unfairly burdened with substantial rate increases if the CPUC does not approve CalAm's Low Income Rate Relief Proposals before rate increases from the Project impact the bills of CAP customers:

> **Water Conservation**. PRIOR TO THE COMMENCEMENT OF PROJECT OPERATIONS, the Permittee shall offer all customers enrolled in its Customer Assistance Program for the Monterey service area, including both single-family and multi-family residential customers, free installation of low-flow fixtures (sink and bathtub faucets, showerheads, and toilets) meeting all minimum California Energy Commission or any other applicable efficiency standards. If an eligible customer and the owner of the property in which the customer resides accepts such offer, the Permittee shall install or cause to be installed appropriate such low-flow fixtures in the customer's residence within six months. The Permittee shall submit a final report to the Executive Director that includes, at a minimum, evidence that such offer was made to eligible customers and statistics showing the number of customers who have accepted the offer and had the low-flow fixtures installed.
>
> **Low-Income Rate Assistance**. PRIOR TO THE COMMENCEMENT OF PROJECT OPERATIONS, the Permittee shall seek the California Public Utilities Commission's approval of one or more low income rate relief programs to minimize rate increases on low-income customers resulting from the Monterey Peninsula Water Supply Project Desalination Facilities, which include the source water wells, desalination treatment facility, and desalination conveyance pipelines ("Project"), with the goal of completely offsetting such rate increases for the average customer enrolled in Permittee's Customer Assistance Program. The Permittee shall ensure that, upon the commencement of the Project's deliveries of product water to Permittee's Monterey service area, customers enrolled in the Permittee's Customer Assistance Program shall not experience a rate increase resulting from the Project that exceeds $10 per month through 2030. Following permit issuance, the Permittee shall submit an annual report to the Executive Director demonstrating (i) the actions Permittee

has taken with the CPUC to secure low income rate relief program approvals; (ii) the CPUC's approval or denial of such programs; (iii) the impact all approved programs are having on the average customer enrolled in Permittee's Customer Assistance Program; and (iv) that Permittee has complied with the other requirements of this condition.

CalAm is confident that, based on its prior decisions and current rulemaking proceedings, the CPUC will support and approve measures to increase water affordability. Indeed, the CPUC is committed to ensuring that public utilities' water service is affordable and that low-income assistance programs are a means of promoting affordability, as demonstrated in the statements in various orders and decisions shown in Attachment A.

Please let me know if you have any questions about the information provided in this letter. We look forward to presenting the Project to the Coastal Commission in November 2022.

Sincerely,

Ian Crooks
California American Water Company

Attachment

cc: Kate Huckelbridge, California Coastal Commission
Noaki Schwartz, California Coastal Commission
Kathryn Horning, California-American Water Company
DJ Moore, Latham & Watkins LLP
Winston Stromberg, Latham & Watkins LLP

ATTACHMENT A

The following show that the CPUC is committed to ensuring water service is affordable and that low-income assistance programs are a means of promoting affordability.

Low-Income Ratepayer Assistance Rulemaking 17-06-024 (currently considering whether further improvements to water affordability are needed)

Decision and Order, issued September 3, 2020 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K225/346225800.PDF)

- Page 105, Conclusion of Law 10: Water utilities should provide analysis in their next GRC case to determine the appropriate Tier 1 breakpoint that aligns with the baseline amount of water for basic human needs for each ratemaking area.

- Ordering Paragraph 2: Water utilities shall provide analysis in their next general rate case applications to determine the appropriate Tier 1 breakpoint that is not less than the baseline amount of water for basic human needs for each ratemaking area.

Phase II Decision Continuing Suspension of Disconnections for Nonpayment of Water Utility Bills Accumulated During the Statewide Water Disconnection Moratorium and Improving Access to the Low-Income Water Rate Assistance Programs Statewide, issued July 20, 2021 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M394/K023/394023418.PDF)

- Page 18: Intentions to create statewide and national low-income water rate assistance programs have been announced. Today in California, only Commission-regulated water utilities uniformly offer the CAP program. In Phase II of this proceeding, we considered expansions and improvements to CAP, as an avenue for COVID relief.

- Page 27: Data exchanges have proven over the years to be the most effective enrollment method for water utility customers. We continue to focus on improving data exchanges to ease access to the CAP program for qualifying customers.

- Page 73, Findings of Fact 1: Water service is critical to public health.

- Page 75, Findings of Fact 22: Low-income water rate assistance programs are a means of promoting water affordability.

Assigned Commissioner and Administrative Law Judge's Third Amended Scoping Memo and Ruling, issued July 30, 2021 (https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M396/K193/396193387.PDF)

- Page 1: Since June 2017, R.17-06-024 has examined the various issues concerning affordability of clean, safe drinking water consistent with California's statutory recognition of the human right to water.

- Page 3: In Phases I and II of R.17-06-024, the Commission coordinated with the State Water Board to ensure that public water systems, regardless of their regulatory jurisdiction, meet the same standards for safe and reliable drinking water which is affordable to all.

- Page 6: The issues to be determined in Phase III of R.17-06-024 are: (a) How best to leverage the available relief funding? (b) Whether supplemental relief funding is needed; (c) What, if any, further improvements to water affordability are needed; and (d) Implementation issues, if any, relating to the new legislation affecting water affordability, including but not limited to SB 998, AB 401 and SB 139 enacted since R.17-06-024 was issued in 2017.

Affordability Rulemaking 18-07-006 (this rulemaking addresses affordability in general)

Order Instituting Rulemaking to Develop Methods to Assess the Affordability Impacts of Utility Rate Requests and Commission Proceedings, issued July 23, 2018 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M218/K186/218186836.PDF)

- Page 3: Californians rely on utility services, including electricity, gas, water, and telecommunications, to live and work. The Commission's commitment to ensuring these services remain affordable and accessible to Californians is articulated in Strategic Directive (SD) 04 on Rates and Affordability and SD 05 regarding Universal Access.

Decision Adopting Metrics and Methodologies for Assessing the Relative Affordability of Utility Service, issued July 7, 2020 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M344/K049/344049206.PDF)

- Page 3: While ensuring the affordability of utility services is a longstanding priority for the Commission, its importance has been magnified this year by COVID-19, which has placed great financial stress on millions of Californians.

- Page 94, Conclusion of Law 1: The Commission is generally charged with making certain levels of energy, water, and communications service affordable under various sections of the Public Utilities Code, including Section 739(d)(2), Section 382, Section 739.8(a), and Section 871.5.

- Page 95, Conclusion of Law 5: The Commission should define metrics to measure the relative affordability of essential utility services as this will allow Commission decisionmakers and stakeholders to consider the impact of Commission decisions on the relative affordability of these services, and help the Commission to meet statutory requirements to consider affordability as a goal when designing rates for essential utility services.

Decision Implementing the Affordability Metrics, issued August 9, 2022 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K428/496428621.PDF)

- Page 7: In D.20-07-032, the Commission concluded the metrics would help the Commission meet statutory requirements of Public Utilities Code (Pub. Util.) Code Section 739(d)(2), Section 382, Section 739.8(a), and Section 871.5 mandating affordable energy, gas and water, and of Section 709, Sections 280-281, and Section 275.6 assigning the Commission a significant role in preserving universal access to essential communications services.

- Pages 8-9: The Commission has the obligation to consider whether utility rates and charges are affordable while also enforcing the mandate of Pub. Util. Code Section 451 to ensure costs authorized and recovered from ratepayers are just and reasonable, consistent with safe and reliable service.16 Equally pertinent, Pub. Util. Code Section 45417 requires electric, gas, water, and telephone corporations to notify affected customers of proposed revenue changes that will impact their utility bill, by displaying rate impacts of the proposed revenue change in dollars and degree of change (percentage). Subsections (c) and (d) of Pub. Util. Code Section 454 express the legislative intent associated with notice requirements, and directs the Commission to consider both the utility proposal, together with the informed response of the people subject to the proposal, before taking action:

  (c) The commission may adopt rules it considers reasonable and proper for each class of public utility providing for the nature of the showing required to be made in support of proposed rate changes, the form and manner of the presentation of the showing, with or without a hearing, and the procedure to be followed in the consideration thereof. Rules applicable to common carriers may provide for the publication and filing of any proposed rate change together with a written showing in support thereof, giving notice of the filing and showing in support thereof to the public, granting an opportunity for protests thereto, and to the consideration of, and action on, the showing and any protests filed thereto by the commission, with or without hearing. [. . .] (d) The commission shall permit individual public utility customers and subscribers affected by a proposed rate change, and organizations formed to represent their interests, to testify at any hearing on the proposed rate change, [. . .]

- Page 79, Conclusion of Law 1: The Commission is generally charged with making certain levels of energy, water, and communications service affordable under various sections of the Public Utilities Code, including Section 739(d)(2), Section 382, Section 739.8(a), and Section 871.5.

- Page 80, Conclusion of Law 6: Introducing the affordability framework in individual proceedings facilitates examination of affordability impacts within the context of the individual proceeding and aids the Commission in fulfilling its statutory mandates.

- Page 80, Conclusion of Law 8: The Commission should enhance customer understanding of pending rate changes for utility service by regularly requiring water and energy utilities to itemize, by proceeding, new revenues recently approved as well as revenues approved but not yet implemented, and revenues pending Commission consideration, relative to rates in effect.

- Page 82, Ordering Paragraph 2: Beginning 30 days after the issuance of this decision… California-American Water Company… shall [] submit quarterly the Water Cost and Rate Tracker (Water Tracker) to the Commission's Water Division and to the Commission's Public Advocate's Office on February 1, May 1, August 1 and November 1 of each year and shall work with staff during the next phases of this proceeding with respect to using the Water Tracker for evaluating affordability metrics' inputs and other ongoing support of the Commission's work. The Director of the Water Division may change the frequency, format, or content of the Water Tracker.

- Pages 85-87, Ordering Paragraphs 8-9:

  8. Beginning 30 days after the issuance of this decision, in any initial filing in any proceeding with a revenue increase estimated to exceed one percent of currently approved revenues systemwide, … California-American Water Company … shall introduce updated Affordability Ratio 20 (AR20) by ratemaking area, Affordability Ratio 50 (AR50) by ratemaking area, and Hours-at-Minimum-Wage (HM) for revenues in effect at the time of the filing, and shall also include:
     - Essential usage bills by ratemaking area; and
     - Average usage bills by ratemaking area and resulting AR20, AR50, and HM for average usage bills.
     - If the proceeding is a General Rate Case, concurrent with any modeling effort necessary to represent bill impacts of an authorized revenue requirement associated with a Proposed Decision, the same entity updating the rates associated with an authorized revenue requirement shall update the affordability metrics for production in the same Commission document that presents the rate impacts.

  9. Beginning 30 days after the issuance of this decision, in any initial Tier 3 Advice Letter (AL) filing requesting a revenue increase estimated to exceed one percent of currently approved revenues systemwide, … California-American Water Company…shall introduce changes in the Affordability Ratio 20 (AR20) by ratemaking area, Affordability Ratio 50 (AR50) by ratemaking area, and Hours-at-Minimum-Wage (HM) annually for each year in which new revenues are proposed, and shall also include changes by:
     - Essential usage bills by ratemaking area; and
     - Average usage bills by ratemaking area and resulting AR20, AR50, and HM for average usage bills.
     - If the filing is a General Rate Case, concurrent with any modeling effort necessary to represent bill impacts of an authorized revenue requirement associated with a Proposed Resolution, the same entity updating the rates associated with an authorized revenue requirement shall update the affordability metrics for production in the same Commission document that presents the rate impacts.

CPUC Environmental & Social Justice Action Plan, approved April 7, 2022 (cpuc.ca.gov/-/media/cpuc-website/divisions/news-and-outreach/documents/news-office/key-issues/esj/esj-action-plan-v2jw.pdf)

- Page 9: The CPUC is tasked with serving all Californians, and to do so equitably while reaching the state's climate goals, it must acknowledge that some populations in California face higher barriers to access to clean, safe, and affordable utility services.

- Page 10: In 2012, California officially passed the Human Right to Water Act, 13 providing that, "every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." 14 The CPUC continues to act for all Californians to have access to clean, safe, and affordable water supplies.

- Page 38, Commission ESJ action item 3.2.2: Understanding and Acting on Affordability of Water Rates. Description: Given both the opportunity to utilize new affordability metrics and information from the Drinking Water Needs Assessment from the State Water Resources Control Board (SWRCB), continue to understand where ESJ customers are experiencing disproportionately high water rates. Tentative Work Plan: 1- Consider affordability metrics in water General Rate Cases (GRCs) 2- With the aid of information from the Drinking Water Needs Assessment, evaluate whether there are water systems within CPUC's jurisdiction where customers experience high rates that could be ameliorated with consolidation 3-Consider whether the CPUC should open an OIR on the subject of new standards for consolidation of water utility systems

CPUC Strategic Directives, Governance Process Policies, and Commission-Staff Linkage Policies, updated February 27, 2020 (https://www.cpuc.ca.gov/-/media/cpuc-website/transparency/commissioner-committees/finance-and-administration/2021/strategic-directives-and-governance-policies.pdf)

- Strategic Directive SD-04: The CPUC promotes policies and rules that provide customers access to and affordable essential services for energy, communications, water and transportation. Within its jurisdictional authority, the CPUC will… 2. Assure that essential services are available to all Californians at an affordable price;

Docket	:	A.21-11-024
Exhibit Number	:	Cal Adv - #
Commissioner	:	Darcie Houck
Administrative Law Judge	:	Zita Kline
Public Advocates Office		
Witness	:	Daphne Goldberg

PUBLIC ADVOCATES OFFICE
CALIFORNIA PUBLIC UTILITIES COMMISSION

REPORT AND RECOMMENDATIONS

Application 21-11-024 Phase 2

San Francisco, California
August 19, 2022

Th7a & 8a -- Exhibit 11

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ATTACHMENT 2 – CAL AM'S RESPONSE TO PUBLIC ADVOCATES OFFICE DATA REQUEST DG-05

ATTACHMENT 3 – QUALIFICATIONS OF WITNESS

MEMORANDUM

The Public Advocates Office at the California Public Utilities Commission (Cal Advocates) examined requests and data presented by California American Water (Cal Am) in Application (A.) 21-11-024 (Application) to provide the California Public Utilities Commission (Commission) with recommendations that represent the interests of ratepayers for safe and reliable service at the lowest cost. This Report is prepared by Daphne Goldberg. Mukunda Dawadi is Cal Advocates' oversight supervisor, and Angela Wuerth is legal counsel.

Although every effort was made to comprehensively review, analyze, and provide the Commission with recommendations on each ratemaking and policy aspect of the requests presented in the Application, the absence from Cal Advocates' testimony of any particular issue does not constitute its endorsement or acceptance of the underlying request, or the methodology or policy position supporting the request.

I. INTRODUCTION

This Report presents conclusions from Cal Advocates' analysis of California American Water's (Cal Am) updated supply and demand estimates related to the Amended and Restated Water Purchase Agreement for the Pure Water Monterey Groundwater Replenishment Project (WPA)[1] and proposed infrastructure investments for its Monterey system.[2]

II. SUMMARY OF CONCLUSIONS

1. Cal Am should have available supply to meet forecasted demand with the WPA water until 2040.[3]
2. Cal Am should have available supply to meet forecasted demand without the WPA until the year 2029.[4]
3. Cal Am has not provided a satisfactory explanation for why its demand forecasts in the current application are approximately 18% greater than its demand forecasts subsequently submitted to the Commission in its current General Rate Case (GRC) application.

III. ANALYSIS

A. Analysis of Supply 1) With WPA and 2) Without WPA

Scenario 1: With WPA Conclusion: Cal Am should have available supply to meet forecasted demand[5] with the WPA until 2040, as shown in Chart 1, below.

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[1] Includes PWM Expansion project.

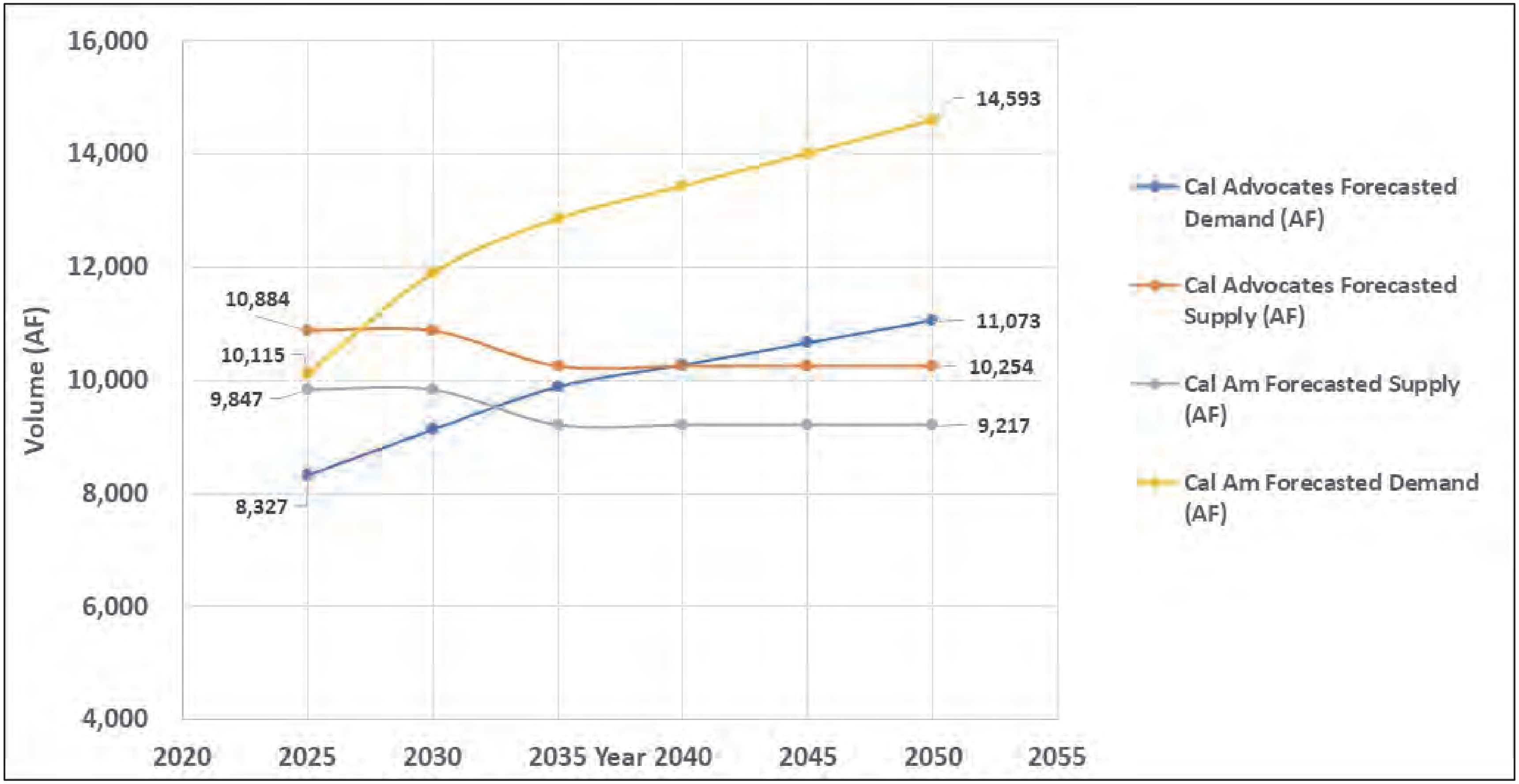
[2] Phase 1 included a review of Cal Am's infrastructure investments request for four projects (Carmel Valley Pump Station, Parallel Pipeline, Extraction wells 1&2, and Extraction wells 3&4) for the simultaneous injection and extraction of groundwater and distribution to its Monterey customers.

[3] Assuming all forecasted demands included in this report.

[4] Assuming all forecasted demands included in this report.

[5] Assuming all forecasted demands included in this report.

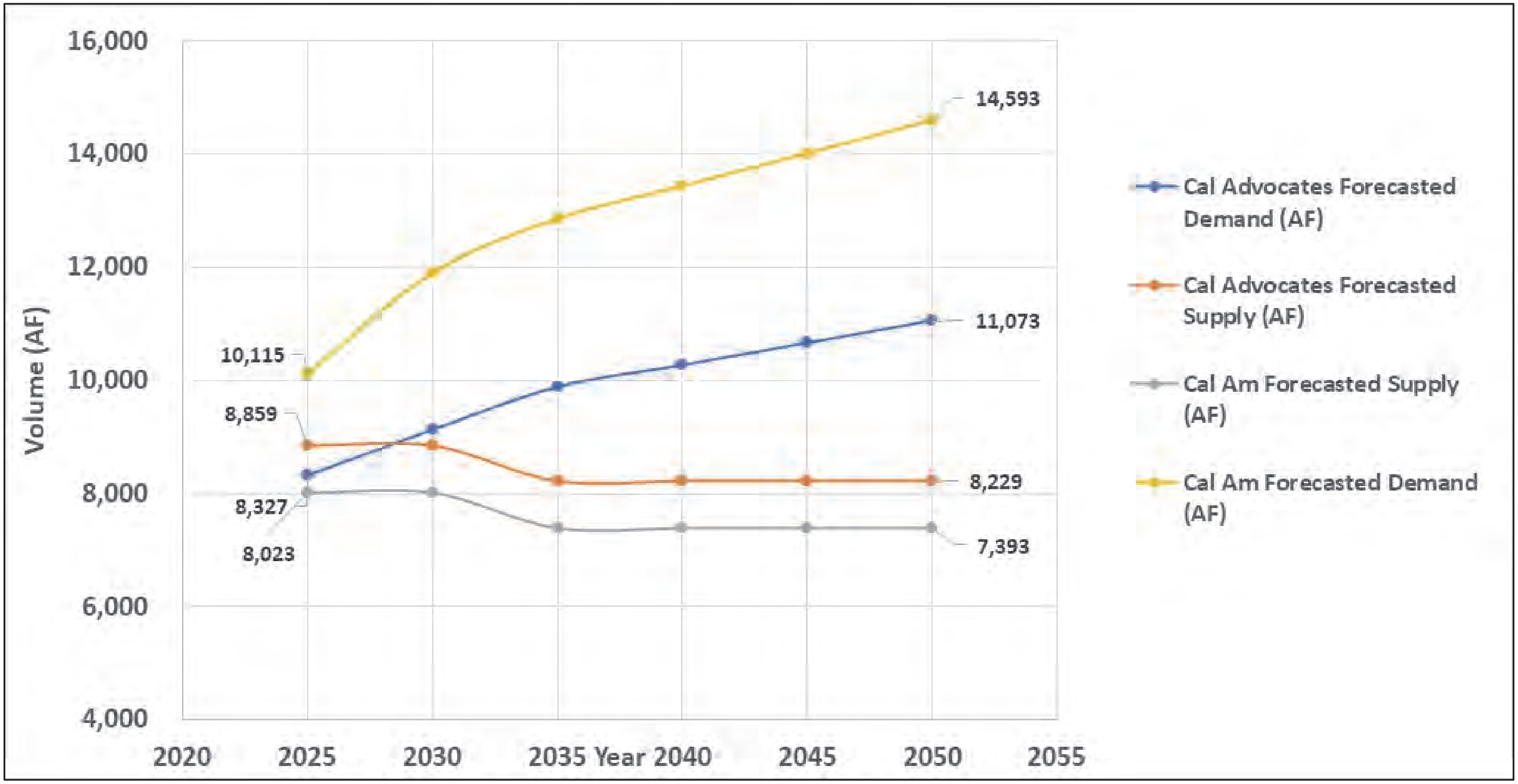
Chart 1: Comparison of Forecasted Water Supply and Demand with WPA (2025-2050)



Scenario 2: Without WPA Conclusion: Cal Am should have available supply to meet forecasted[6] demand without the WPA water until the year 2029, as shown in Chart 2, below.

[6] Assuming all forecasted demands included in this report.

Chart 2: Comparison of Forecasted Water Supply and Demand Without WPA Water (2025-2050)



The analysis and reasoning supporting the two conclusions, above, are presented in the following sections of this report.

B. Supply

A comparison of Cal Am's and Cal Advocates' forecasted 2025-2050 Monterey Main system supply, including WPA water, is shown in Table 1, below. Differences between Cal Advocates' and Cal Am's forecasts are described in the sections that follow.

Table 1: Comparison of Supply Sources with WPA (2025-2050)[7] [8] [9]

Available Supply (AF)	Cal Am						Cal Advocates					
Source	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Carmel River	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376
Seaside Basin	1,474	1,474	774	774	774	774	1,474	1,474	774	774	774	774
Aquifer Storage and Recovery	470	470	470	470	470	470	1,210	1,210	1,210	1,210	1,210	1,210
Table 13	-	-	-	-	-	-	189	189	189	189	189	189
Sand City Desalination	94	94	94	94	94	94	94	94	94	94	94	94
WPA	5,527	5,527	5,527	5,527	5,527	5,527	5,750	5,750	5,750	5,750	5,750	5,750
Total before 10% Buffer	10,941	10,941	10,241	10,241	10,241	10,241	12,093	12,093	11,393	11,393	11,393	11,393
10% Supply Buffer	1,094	1,094	1,024	1,024	1,024	1,024	1,209	1,209	1,139	1,139	1,139	1,139
Total after 10% Buffer	**9,847**	**9,847**	**9,217**	**9,217**	**9,217**	**9,217**	**10,884**	**10,884**	**10,254**	**10,254**	**10,254**	**10,254**

[7] For Carmel River supply, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', pp. 27-29. For Seaside Basin supply, see pp.29-32. For Sand City Desalination water supply, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', pp. 39-41, For discussion of 10% Supply Buffer, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks' pp. 67-69.

[8] In Table 1, Cal Am's Available Supply data assumes Cal Am's "normal year" scenario. A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 67.

[9] In Table 1, Cal Am's Seaside Basin Available Supply decreases from 1,474 AF in 2030 to 774 AF in 2035 due to Cal Am's "overpumping repayment plan." A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 30, lines 17-21. See also Cal Am's response to Public Advocates Office Data Request DG-04. Q.1., Attachment 1 and Attachment 2.

Table 2: Comparison of Supply Sources without WPA[10] [11] [12]

Available Supply (AF)	Cal Am						Cal Advocates					
Source	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Carmel River	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376	3,376
Seaside Basin	1,474	1,474	774	774	774	774	1,474	1,474	774	774	774	774
Aquifer Storage and Recovery	470	470	470	470	470	470	1,210	1,210	1,210	1,210	1,210	1,210
Table 13	-	-	-	-	-	-	189	189	189	189	189	189
Sand City Desalination	94	94	94	94	94	94	94	94	94	94	94	94
WPA	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Total before 10% Buffer	8,914	8,914	8,214	8,214	8,214	8,214	9,843	9,843	9,143	9,143	9,143	9,143
10% Supply Buffer	891	891	821	821	821	821	984	984	914	914	914	914
Total after 10% Buffer	**8,023**	**8,023**	**7,393**	**7,393**	**7,393**	**7,393**	**8,859**	**8,859**	**8,229**	**8,229**	**8,229**	**8,229**

[10] For Carmel River supply, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', pp. 27-29. For Seaside Basin supply, see pp.29-32. For Sand City Desalination water supply, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', pp. 39-41, For discussion of 10% buffer, see pp. 67-69.

[11] In Table 2, Cal Am's Available Supply data assumes Cal Am's "normal year" scenario. A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 67.

[12] In Table 1, Cal Am's Seaside Basin Available Supply decreases from 1,474 AF in 2030 to 774 AF in 2035 due to Cal Am's "overpumping repayment plan." A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 30, lines 17-21. See also Cal Am's response to Public Advocates Office Data Request DG-04. Q.1., Attachment 1 and Attachment 2.

1. Pure Water Monterey and Pure Water Monterey Expansion Water

Cal Am's WPA forecasted amounts are inconsistent with the total amount defined in the Amended and Restated Water Purchase Agreement.[13] Cal Am forecasts between zero and 2,027 Acre-Feet (AF) of Pure Water Monterey Expansion water supply.[14] However, the Amended WPA guarantees Cal Am a "Company Allotment" of 5,750 (3,500+2,250) AF after the PWM expansion is complete.[15]

2. Table 13 Water

In October 2013, the State Water Resources Control Board issued Cal Am Water Right Permit 21330, also known as "Table 13" water, for Carmel River diversions "limited to the quantity which can be beneficially used from December 1 of each year to May 31 of the succeeding year and cannot exceed a rate of 4.1 cubic feet per second (cfs) and a maximum annual diversion of 1,488 AF."[16]

The average of 2013-2021 Table 13 annual water production is 189 AF[17], which, if added, increases Cal Am's forecasted total supply amount.[18] Cal Am's supply forecast

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[13] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 65, line 24 and p. 66, line 1.

[14] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 8, p. 67.

[15] A.21-11-024, Application of California-American Water Company (U210W) to Obtain Approval of the Amended and Restated Water Purchase Agreement for the Pure Water Monterey Groundwater Replenishment Project, Update Supply and Demand Estimates for the Monterey Peninsula Water Supply Project, and Cost Recovery, November 29, 2021, Attachment A, p.5.

[16] Cal Am also states that "Diversion of Table 13 water is dependent on seasonal flows and is vulnerable to drought conditions and climate change." A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 37, line 23, p. 38, lines 1-3 and lines 19-20.

[17] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 6, p.38,

[18] 189 AF equals 82,382 CCF (hundred cubic feet). Cal Am recorded approximately 61 CCF per single-family residential customer in 2021. Therefore, Cal Am can serve approximately 1,350 single family residential customers with 189 AF of water (82,382/61 = 1,350). See Cal Am A.22-07-001, GRC workpapers "ALL_CH03_REV_RO_Sales-Customers", tab "Projected Sales WS-04", Cell X31.

excludes Table 13 water,[19] even though Cal Am recorded Table 13 historical production for 2013-2021 and includes it in its application.[20]

3. Aquifer Storage and Recovery

Cal Am's "ASR Availability and Analysis Technical Memorandum" (ASR Technical Memo) concludes that 1,210 AF is the average of simulated annual water available from aquifer storage and recovery (ASR).[21] This appears to be a reasonable forecast. ASR refers to the program that allows excess Carmel River water to be injected and stored in the Seaside Basin during wet months and used during dry months.[22] The ASR Technical Memo conclusions about forecasted ASR availability are based on a simulation of 59 years of hypothetical ASR diversions[23] and assumptions.[24] The 1,210AF represents the average of annual simulated water supply. This average accounts for the variability of simulated historical annual water availability. However, Cal Am uses the same historical simulated annual data and assumes a reduction without any justification.[25]

C. Demand

A comparison of Cal Advocates' and Cal Am's forecasted 2025-2050 Monterey Main system demand is shown in Table 3, below. Differences between Cal Advocates' and Cal Am's forecasts are described in the sections that follow.

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[19] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 8, p. 67.

[20] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 6, p. 38,

[21] A.21-11-024, Phase 2 Direct Testimony of Paul Findley, Attachment 1, p. 12.

[22] A.21-11-024, Phase 2 Direct Testimony of Paul Findley, Attachment 1, p. 1.

[23] A.21-11-024, Phase 2 Direct Testimony of Paul Findley, Attachment 1, p. 5.

[24] A.21-11-024, Phase 2 Direct Testimony of Paul Findley, Attachment 1, p. 4.

[25] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 37, lines 10-14.

Table 3: Comparison of Forecasted Demand (2025-2050)[26] [27] [28] [29]

Forecasted Demand (AF)	Cal Am						Cal Advocates					
Demand Category	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Residential demand	5,031	5,644	5,754	5,864	5,974	6,084	5,297	5,403	5,511	5,621	5,734	5,848
Non-Residential demand	4,834	5,019	5,204	5,389	5,574	5,759	3,030	3,091	3,152	3,215	3,280	3,345
Total Residential and Non-Residential demand	9,865	10,663	10,958	11,253	11,548	11,843	8,327	8,494	8,663	8,837	9,013	9,194
Pebble Beach Entitlements	-	65	130	195	260	325	-	65	130	195	260	325
Tourism	250	500	500	500	500	500	-	-	-	-	-	-
Legal Lots of Record												
Single Family Residential	-	59	103	147	190	234	-	-	-	-	-	-
Multi Family Residential	-	35	60	86	111	137	-	-	-	-	-	-
Commercial	-	158	274	389	505	621	-	158	274	389	505	621
Residential Remodels	-	27	47	66	86	106	-	27	47	66	86	106
Commercial Remodels	-	21	36	51	67	82	-	21	36	51	67	82
Legal Lots of Record Total		300	520	739	959	1,180	-	206	357	506	658	809
RHNA Demands	-	370	745	745	745	745	-	370	745	745	745	745
Total	**10,115**	**11,898**	**12,853**	**13,432**	**14,012**	**14,593**	**8,327**	**9,135**	**9,895**	**10,283**	**10,676**	**11,073**

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26 For Cal Am's demand forecast, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24.

27 Cal Am's GRC Application A.22-07-001, 2025 forecasted residential consumption is 5,297AF and 2025 forecasted non-residential consumption is 3,030 AF for a total of 8,327 AF. Residential demand includes both single family and multi-family residential. See Cal Am's A.21-07-001 GRC 2025 Residential and Non-Residential Demand forecasts in workpaper ALL_CH03_REV_RO_Sales-Customers, tab Projected Sales WS-04, Cells C31-39, F31-39, G31-39, and AY31-AY39. Note: Conversion to (AF) is calculated and not included in GRC workpapers. See also Cal Am's response to Public Advocates Office Data Request DG-05, Q.1.

28 Cal Advocates has not yet completed its analysis of the supply and demand data filed by Cal Am in its GRC A.22-07-001. By referencing Cal Am's GRC forecasted residential and non-residential demand, and non-revenue water, Cal Advocates is not conceding that such numbers are reasonable and justified. Instead, Cal Advocates is referencing the numbers used by Cal Am in its GRC to highlight a discrepancy between those figures and the figures in the instant proceeding.

29 Based on Cal Am's GRC A.22-07-001, 2025 non-revenue water is forecasted to be 264,394 CCF, calculated as 607AF. Cal Advocates forecasted non-residential water demand in the table excludes non-revenue water. Cal Am's forecasted non-residential demand includes non-revenue water. See Cal Am's response to Public Advocates Office Data Request DG-05, Q.1 and "ALL_CH03_REV_RO_Water Production", tab "Projected Wtr Prod WS-04", Cell AI103. See also A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, footnote 4, p. 24.

1. Forecasted Water Demand Growth

Cal Am's forecasted residential demand increase of 10% (rounded) between 2025 and 2030[30] and approximately 3.7% non-residential demand growth every five years between 2030 and 2050[31] is inconsistent with Cal Am's own data. Cal Am's data projects 2% (rounded) population growth[32] every five years until 2050, and the residential and non-residential demand should be consistent with that projection.

Cal Am forecasts an average of 2% (rounded) population growth[33] every five years between 2025 and 2050 and forecasts a 10% (rounded) increase in residential demand between 2025 and 2030.[34] However, forecasted demand growth that exceeds 2% appears inconsistent with Cal Am's water conservation planning efforts.[35] Despite requesting customer funding of $1,655,000[36] to promote conservation in Monterey, in its current GRC application, Cal Am forecasts in this proceeding[37] that these efforts will result in current residential customers increasing their demand by 10% and non-residential demand by 3.7%.[38]

Finally, Cal Am's own Monterey Peninsula Water Supply Project website data shows a decrease in recorded system deliveries for the past few years.[39] Therefore, a 2% increase in residential and non-residential demand every five years between 2025 and

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[30] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, footnote 3, p. 24.

[31] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24.

[32] Cal Am's annual population growth forecasts are based on the Association of Monterey Bay Area Governments (AMBAG) Regional Growth Forecast. A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24 and Attachment D, Attachment 2.

[33] Cal Am's annual population growth forecasts are based on the Association of Monterey Bay Area Governments (AMBAG) Regional Growth Forecast. A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24 and Attachment D, Attachment 2.

[34] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, footnote 3, p. 24.

[35] A.22-07-001, Direct Testimony of Patrick Pilz, p. 2, lines 22-26.

[36] A.22-07-001, Direct Testimony of Patrick Pilz, Attachment 1, pp. 3-4.

[37] A.21-11-024.

[38] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, footnote 3, p. 24.

[39] https://www.watersupplyproject.org/system-delivery.

2050 is reasonable, which is approximately equal to Cal Am's forecasted 2% population growth every five years of the same time period.

2. 2025 Residential and Non-Residential Demand

Cal Am has not provided a satisfactory explanation for why its demand forecasts in the current application are approximately 18% greater than its demand forecasts subsequently submitted to the Commission in its current General Rate Case (GRC) application. For the Year 2025, Cal Am presents, different total residential and non-residential demand forecasts, shown in Table 4, below.[40] [41] [42]

Table 4: Cal Am's 2025 Forecasted Demand Comparison [43] [44] [45]

Application	A.21-11-024	A.22-07-001 GRC
2025 Residential Demand (AF)	5,031	5,297
2025 Non-Residential Demand (AF)	4,834	3,030
Total	**9,865**	**8,327**

The difference in the corresponding 2025 figures demonstrates how customer rates are affected by decreased demand. Customer rates are based, in part, on forecasted demand and supply estimates. For example, in its current application, Cal Am forecasts total demand that exceeds its forecasted supply, which may justify the need for a new

[40] A.21-11-024.

[41] A.22-07-001.

[42] In A.21-11-024, Cal Am did not specify a Non-Revenue Water amount in its Non-Residential demand calculation. See Cal Am's response to Public Advocates Office data request DG-05, Q.1.

[43] For Cal Am's demand forecast, see A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24.

[44] In Table 4, above, Residential demand includes both single family and multi-family residential. See Cal Am's A.21-07-001 GRC 2025 Residential and Non-Residential Demand forecasts in workpaper ALL_CH03_REV_RO_Sales-Customers, tab Projected Sales WS-04, Cells C31-39, F31-39, G31-39, and AY31-AY39. Note: Conversion to (AF) is calculated and not included in GRC workpapers.

[45] In Table 4, above, Cal Am's A.22-11-024 non-residential demand data includes non-revenue water. Cal Am's A.22-07-001 non-residential demand data excludes non-revenue water. Based on Cal Am's GRC A.22-07-001, 2025 non-revenue water is forecasted to be 264,394 CCF, calculated as 607AF. See Cal Am's response to Public Advocates Office Data Request DG-05, Q.1 and "ALL_CH03_REV_RO_Water Production", tab "Projected Wtr Prod WS-04", Cell AI103

water source.[46] Accordingly, a lower forecasted demand may result in higher rates. For example, assuming that the required water supply is available, and the revenue requirement remains the same, when forecasted sales are lower, rates would need to be higher to recover the revenue requirement. The example in Table 5, below, demonstrates a hypothetical effect of a reduction in demand on customer rates.

Table 5: Example of Forecasted Demand's Effect on Customer Rates

Revenue Requirement	Demand (CCF)	Customer Rate ($)
$100	50 CCF	$2
$100	25 CCF	$4

Cal Am tries to justify its two different estimates for 2025 by stating that forecasted demand figures differ because one set of data, Cal Am's current application, is used for long-term water supply planning and its GRC application data is used for short-term sales and rate making.[47]

Regardless of the purpose of the data and analysis, whether it is for a GRC or long-term planning for infrastructure, the disparate forecasted demands are for the same period. The analysis should be based on recent factual data regarding supply and demand and should be expected to produce the same results for the same time period being forecasted. The analysis presented in this report is based on the recent data regarding demand and supply submitted by Cal Am to the Commission for authorization in its current GRC application.[48]

[46] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', Table 8, p. 67,

[47] Cal Am's response to Public Advocates Office Data Request DG-05, Q.1.a.

[48] Cal Advocates has not yet completed its analysis of the supply and demand data filed by Cal Am in its GRC A.22-07-001. By referencing Cal Am's GRC forecasted residential and non-residential demand, Cal Advocates is not conceding that such numbers are reasonable and justified. Instead, Cal Advocates is referencing the numbers used by Cal Am in its GRC to highlight a discrepancy between those figures and the figures in the instant proceeding.

3. Non-Revenue Water

The forecasted demand for the non-revenue water is uncertain,[49] but can be met by the 10% Supply Buffer of the water supply, as shown in Tables 1 and 2, above.[50] [51] Forecasted Non-revenue water demand is uncertain because, for example, water demand due to fires and leaks are unpredictable. Cal Am states that its 10% Supply Buffer is necessary to account for "potential demand increases and supply fluctuations, including demand for fire service and the need for protective water levels in the Seaside Basin, among other future variables that cannot be anticipated with certainty."[52] Therefore, non-revenue water demand, if needed, can be met by the 10% Supply Buffer.

4. Legal Lots of Record and Regional Housing Needs Allocation

Cal Am's 2030-2050 forecasted Legal Lots of Record demand includes single and multi-family residential demand shown in Table 6, below.[53] However, Cal Am's 2025-2050 Forecasted Demand already includes forecasted demand associated with the Regional Housing Needs Allocation (RHNA). Cal Am assumed that no RHNA units would be built on Legal Lots of Record.[54] However, this assumption is unsupported and unreasonable.

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[49] Non-revenue water includes "those components of system input volume that are not billed and produce no revenue; equal to unbilled authorized consumption, plus apparent losses, plus real losses." A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', Attachment A, includes document: 2016 Monterey Peninsula Water Management District, Monterey Peninsula Water Conservation and Rationing Plan, Adopted February 17, 2016, p.37.

[50] Based on Cal Am's GRC A.22-07-001, 2025 non-revenue water is forecasted to be 264,394 CCF, calculated as 607AF. See Cal Am's GRC A.22-07-001. See Cal Am's A.21-07-001 GRC 2025 Non-Revenue forecast in workpaper ALL_CH03_REV_RO_Water Production, tab Projected Wtr Prod WS-04, Cell AH103.

[51] For example, Table 1 shows Cal Advocates 2025 10% Supply Buffer calculated as 1,209 AF compared to 607AF. See Cal Am's GRC A.22-07-001. See Cal Am's A.21-07-001 GRC 2025 Non-Revenue forecast in workpaper ALL_CH03_REV_RO_Water Production, tab Projected Wtr Prod WS-04, Cell AH103.

[52] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 69, lines 7-10.

[53] A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24.

[54] Cal Am's response to Public Advocates Office Data Request DG-05, Q.3.a.-d.

Table 6: Comparison of Forecasted Legal Lots of Record Single and Multi-Family Residential Demand 2030-2050

	Cal Am					Cal Advocates				
Demand Category	**2030**	**2035**	**2040**	**2045**	**2050**	**2030**	**2035**	**2040**	**2045**	**2050**
Single Family Residential (AF)	59	103	147	190	234	0	0	0	0	0
Multi Family Residential (AF)	35	60	86	111	137	0	0	0	0	0
Total (AF)	94	163	233	301	371	0	0	0	0	0

Legal Lots of Record include both developed lots that cannot be expanded or modified and undeveloped commercial, industrial, and residential lots that cannot be developed[55] due to the moratorium on new connections in Cal Am's Monterey service area.[56] The RHNA plan[57, 58] determines, within an eight-year planning period, the total number of housing units that each city and county must plan for.[59] Cal Am states that it "…assumes that no RHNA dwelling units will be built on Legal Lots of Record because the potential overlap between RHNA dwelling units and Legal Lots of Record is expected to be minimal when compared to the overall demand for Legal Lots of Record, and it is uncertain there will be any overlap at all."[60] However, Cal Am has provided no justification for why RHNA dwelling units will not be built on Legal Lots of Record. Therefore, Cal Am's assumption that there is no overlap between forecasted residential Legal Lots of Record demand and RHNA demand is unsupported and unreasonable.

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[55] A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', p. 16, lines 15-22.

[56] See D.11-03-048, which authorizes California American Water to implement moratorium on new connections mandated in the 2009 Cease and Desist Order.

[57] The RHNA plan is prepared by the Association of Monterey Bay Area Governments (AMBAG). The Monterey and Santa Cruz County RHNA plan determines, within an eight-year planning period, the total number of housing units that each city and county must plan for. For additional RHNA background information see A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', pp. 13-16. See also A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', p.13, lines 18-20.

[58] A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', Table 5, p. 24.

[59] A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', pp. 13-16.

[60] Cal Am's response to Public Advocates Office Data Request DG-05, Q.3.a.-d.

5. Tourism Bounce-Back

Cal Am's projected Tourism Bounce-Back demand is not supported. The recorded 2009 to 2021 consumption already accounted for tourism bounce back from 2008. Cal Am states that Tourism Bounce-Back refers to the expectation that once a new permanent water supply is available, and the moratorium on new connections is lifted,[61] occupancy and tourist visits to the Monterey area will return to levels prior to the 2008 "Great Recession."[62] Cal Am bases its forecasted Tourism Bounce-Back demand on an event that occurred fourteen years ago and does not provide sufficient justification for a tourism bounce back to water demand prior to 2008.[63] [64] Therefore, Cal Am's forecasted Tourism Bounce Back demand is not supported.

IV. CONCLUSION

Cal Am should have available supply for forecasted demand with WPA until 2040.

Cal Am should have available supply for forecasted demand without the WPA until the year 2029.

Cal Am has not provided a satisfactory explanation for why its demand forecasts in the current application are approximately 18% greater than its demand forecasts subsequently submitted to the Commission in its current General Rate Case (GRC) application.

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[61] See D.11-03-048, which authorizes California American Water to implement moratorium on new connections mandated in the 2009 Cease and Desist Order.

[62] A.21-11-024 Phase 2 Direct Testimony of Ian Crooks', p. 22, lines 8-11.

[63] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', p. 21, line 21,

[64] A.21-11-024, Phase 2 Direct Testimony of Ian Crooks', pp.21-23, See also, Cal Am's response to Public Advocates Office Data Request DG-05, Q.4.

ATTACHMENT 1

Cal Am's response to Public Advocates Office Data Request DG-04

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of California-American Water Company (U210W) to Obtain Approval of the Amended and Restated Water Purchase Agreement for the Pure Water Monterey Groundwater Replenishment Project, Update Supply and Demand Estimates for the Monterey Peninsula Water Supply Project, and Cost Recovery.	Application 21-11-024 (Filed November 29, 2021)

CALIFORNIA-AMERICAN WATER COMPANY'S RESPONSE TO PUBLIC ADVOCATES OFFICE'S DATA REQUEST DG 04

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Dated: August 8, 2022

California-American Water Company (U-210- W; "California American Water," "CAW" or the "Company") hereby sets forth the following objections and responses to Public Advocates Office's ("Cal Advocates") Data Request DG 04 ("Data Requests" or "RPD"), propounded on July 27, 2022, in A.21-11-024.

RESERVATION OF RIGHTS

1. California American Water's investigation into the Data Requests is ongoing. The Company reserves the right, without obligating itself to do so, to supplement or modify its responses and to present further information and produce additional documents as a result of its ongoing investigation.

2. Any information or materials provided in response to the Data Requests shall be without prejudice to California American Water's right to object to their admission into evidence or the record in this proceeding, their use as evidence or in the record, or the relevance of such information or materials. In addition, California American Water reserves its right to object to further discovery of documents, other information or materials relating to the same or similar subject matter upon any valid ground or grounds, including without limitation, the proprietary nature of the information, relevance, privilege, work product, overbreadth, burdensomeness, oppressiveness, or incompetence.

GENERAL OBJECTIONS

1. California American Water objects to the Data Requests as improper, overbroad, and unduly burdensome to the extent they purport to impose upon California American Water any obligations broader than those permitted by law.

2. California American Water objects to the Data Requests as improper, overbroad, and unduly burdensome to the extent they improperly seek the disclosure of information protected by the attorney-client privilege, the attorney work-product doctrine, or any other applicable privilege or doctrine, and/or the client confidentiality obligations mandated by Business and Professions Code Section 6068(e)(1) and Rule 3-100(A) of the California Rules of Professional Conduct. Such responses as may hereafter be given shall not include information protected by such privileges or

doctrines, and the inadvertent disclosure of such information shall not be deemed as a waiver of any such privilege or doctrine.

3. California American Water objects to the Data Requests to the extent that the requests are duplicative and overlapping, cumulative of one another, overly broad, and/or seek responses in a manner that is unduly burdensome, unreasonably expensive, oppressive, or excessively time consuming to California American Water.

4. California American Water objects to the Data Requests to the extent they seek documents that are and/or information that is neither relevant nor material to this proceeding nor reasonably calculated to lead to the discovery of admissible evidence.

5. California American Water objects to the Data Requests to the extent they seek an analysis, calculation, or compilation that has not previously been performed and that California American Water objects to performing.

6. California American Water objects to the Data Requests insofar as they request the production of documents or information that are publicly available or that are equally available to Cal Advocates because such requests subject California American Water to unreasonable and undue annoyance, oppression, burden and expense.

7. California American Water objects to the Data Requests to the extent the requests are vague, ambiguous, use terms that are subject to multiple interpretations but are not properly defined for purposes of the Data Request, or otherwise provide no basis from which California American Water can determine what information is sought.

8. The objections contained herein, and information and documents produced in response hereto, are not intended nor should they be construed to waive California American Water's right to object to the Data Requests, responses or documents produced in response hereto, or the subject matter of such Data Requests, responses or documents, as to their competency, relevancy, materiality, privilege and admissibility as evidence for any purpose, in or at any hearing of this or any other proceeding.

9. The objections contained herein are not intended nor should they be construed to waive California American Water's right to object to other discovery involving or relating to the subject matter of the Data Requests, responses or documents produced in response hereto.

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Response Provided By:	**Christopher Cook**
Title:	**Director of Operations – Coastal Division**
Address:	**California American Water** **511 Forest Lodge Road, Suite 100** **Pacific Grove, CA 93950**
CalAdv Request:	**DG-04 Q001**
Date Received:	**July 27, 2022**
Date Response Due:	**August 8, 2022**

DATA REQUEST:

1. Please provide the following two technical memos referenced in the Phase 2 Direct Testimony of Christopher Cook:

   a. HydroMetrics' Technical Memorandum dated April 5, 2013, titled 'Groundwater Modeling Results of Replenishment Repayment in the Seaside Basin', as mentioned on p. 3, lines 11-12 of the testimony.

   b. "The latest technical memo that is expected to be presented to the Seaside Basin Watermaster TAC in August 2022", as mentioned on page 4, lines 10-11 of the Testimony.

CAL-AM'S RESPONSE

a. Please refer to CAW Response Cal Adv DG 04 Q001 Attachment 1.

b. Please refer to CAW Response Cal Adv DG 04 Q001 Attachment 2. This August TAC draft technical report analysis shows in Figure 19 that approximately 3,800 AFY of additional replenishment would be required on average over 2024-2035, as compared with the previous 1,000 AFY additional replenishment in the January technical report. This August draft technical report is anticipated to be consolidated with the January technical report and presented at the Seaside Basin Watermaster Board Meeting in September.

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Response Provided By:	**Christopher Cook**
Title:	**Director of Operations – Coastal Division**
Address:	**California American Water** **511 Forest Lodge Road, Suite 100** **Pacific Grove, CA 93950**
CalAdv Request:	**DG-04 Q002**
Date Received:	**July 27, 2022**
Date Response Due:	**August 8, 2022**

DATA REQUEST:

2. Christopher Cook's Phase 2 Testimony states on p. 3 lines 22-23 that "…the 2013 modeling is being updated by Montgomery & Associates to reflect current information such as new hydrology and sources of water."

a. When will Cal Am receive the updated modelling?

b. Please provide the status of the model updates.

CAL-AM'S RESPONSE

2a. The Seaside Basin Watermaster has hired Montgomery & Associates to update the modeling analysis. Cal Am is a member of the Seaside Basin Watermaster TAC and board, where the updated information from the Watermaster consultant will be presented. The Seaside Basin Watermaster TAC has received a draft of the updated replenishment water analysis work as part of its packet for the August 10th meeting and Cal Am submitted this as a response to DG-04 Q001.b. This latest analysis work is expected to be consolidated with the January 2022 work and presented to the board as a final comprehensive replenishment water evaluation at the board's September 7th meeting.

2b. Based on recent correspondence with Seaside Basin Watermaster staff, Montgomery & Associates are on track to have modeling work reports ready for the August 10th TAC and September 7th board meetings.

519 17th Street, Suite 500
Oakland, CA 94612

TECHNICAL MEMORANDUM

To: Seaside Groundwater Basin Board of Directors

From: Georgina King and Derrik Williams

Date: April 5, 2013

Subject: Groundwater Modeling Results of Replenishment Repayment in the Seaside Basin

1.0 BACKGROUND AND MODELING OBJECTIVES

Three scenarios were evaluated by the modeling described in this Technical Memorandum: (1) Scenario 1: A 25-year groundwater overpumping replenishment program proposed by California American Water (Cal-Am); (2) Scenario 2: A set of pumping reductions to achieve protective groundwater levels over a 25-year period; and (3) Scenario 3: Cal-Am's replenishment plan coupled with additional managed aquifer recharge to achieve protective elevations in 25 years.

Under Scenario 1 Cal-Am proposes to repay its post-adjudication overpumping by reducing its Seaside Basin pumping for 25 years. During this 25-year period, Cal-Am plans to provide a portion of the water to its customers from a desalination facility in-lieu of pumping. The desalination facility will be commissioned in 2017. Cal-Am's proposal consists of reducing its pumping by 700 acre-feet per year for 25 years, resulting in a total repayment of 17,500 acre-feet of water. Cal-Am and the Seaside Basin Watermaster Board of Directors asked HydroMetrics Water Resources Inc. (WRI) to perform modeling to determine if this repayment schedule would allow groundwater elevations to reach protective levels.

Cal-Am's proposed replenishment program is intended to repay overpumping credits, but may or may not restore coastal groundwater elevations to protective levels. Under Scenario 2, the amount of pumping reduction that would be necessary to achieve protective elevations in the six coastal protective elevation monitoring wells (if Cal-Am's proposed repayment of replenishment water over 25 years did not achieve protective elevations) was determined.

Similar to the second simulation, the objective of Scenario 3 is to achieve protective groundwater elevations within 25 years. Under Scenario 3, protective elevations are achieved by injecting water in the Santa Margarita aquifer rather than reducing pumping. In this scenario, Cal-Am reduces its pumping by 700 acre-feet per year for 25 years. Additional water is injected into the existing ASR wells to restore groundwater elevations. The amount of water injected into the ASR wells is iteratively adjusted until protective elevations are achieved after 25 years of operation.

2.0 UPDATE PROTECTIVE ELEVATIONS

As a preliminary step in these modeling activities HydroMetrics WRI was asked to revisit and update the protective groundwater elevations, if necessary. Groundwater elevations that protect the Seaside Basin from seawater intrusion have been established at coastal monitoring wells SBWM-3, PCA-West deep and shallow, MSC deep and shallow, and CDM MW-4 using cross-sectional models (HydroMetrics LLC 2009). The locations of these wells are shown in Figure 1. These cross-sectional models were developed before the Seaside Groundwater Basin basinwide groundwater model was calibrated and completed. The horizontal (Kh) and vertical (Kv) hydraulic conductivity fields in the original cross-sectional models were based on estimated conductivities from previous studies. The purpose of this analysis was to evaluate whether incorporating the calibrated conductivity fields from the basinwide model into the cross-sectional models would result in lowering the previously-developed protective elevations. Hydraulic conductivity (Kv and Kh) are parameters that control the rate of flow in aquifers. If the basinwide model has higher hydraulic conductivities occurring below the depth that is being protected from seawater intrusion, the protective groundwater elevations can be lowered.

HydroMetrics WRI analyzed the calibrated conductivity fields in the basinwide model surrounding and offshore of the coastal monitoring wells. Horizontal and vertical conductivity values were identified for all active cells in each layer. Statistics of the conductivities, weighted by basinwide model cell area, were calculated for layers corresponding to hydrostratigraphic units in the cross-sectional model for each well.

2.1 Update Cross-Sectional Modeling of Well SBWM-3

Table 1 compares the original parameter ranges used in the cross-sectional models with the parameter averages calculated from the basinwide model for Sentinel Well 3 (SBWM-3).

Table 1: Well SBWM-3 Cross-sectional Model and Basinwide Model Hydraulic Conductivities

Hydrostratigraphic Unit	Basinwide Model Layers	Cross-sectional Model Kh Range (feet per day)	Average Basinwide Model Kh (feet per day)	Cross-sectional Model Kv Range (feet per day)	Average Basinwide Model Kv (feet per day)
Seabed	N/A	N/A	N/A	Conductance = 0.01 – 10 day^{-1}	N/A
Aromas	1	5 - 20	165	0.05 – 1.0	0.5
Upper & Middle Paso Robles	2-3	2 - 8	5	0.01 – 0.1	0.2
Lower Paso Robles	4	2 - 8	7	0.01 – 0.1	0.003
Purisima	5	2 - 8	19	0.02 - 0.4	0.0002

Note: Kh = horizontal conductivity and Kv = vertical conductivity.

For the SBWM-3 well, the protective elevation is established to protect the aquifer at the well site in the middle of the Purisima Formation. From the cross-sectional model sensitivity analysis (HydroMetrics LLC, 2009; Appendix C), the hydraulic conductivity of the aquifer below the protected depth has the greatest effect on the protective elevation. The basinwide model indicates that horizontal conductivity in the Purisima Formation below the protected location (Layer 5) is greater in the basinwide model than in the original cross-sectional model, suggesting that incorporating the basinwide model parameters will reduce the protective elevation. However, the overall hydraulic conductivity in the Purisima Formation below the protected location is smaller in the basinwide model than in the original cross sectional model due to the much lower vertical conductivity in the model. Therefore, using the parameters from the basinwide model will not lower the protective elevation from the already low value of 4 feet MSL

2.2 Update Cross-Sectional Modeling of PCA-West Wells

Table 2 compares the original parameter ranges used in the cross-sectional models with the averages calculated from the basinwide model for the PCA-West wells (shallow and deep).

Table 2: PCA-West Well Cross-sectional Model and Basinwide Model Hydraulic Conductivities

Hydrostratigraphic Unit	Basinwide Model Layers	Cross-sectional Model Kh Range (feet per day)	Average Basinwide Model Kh (feet per day)	Cross-sectional Model Kv Range (feet per day)	Average Basinwide Model Kv (feet per day)
Seabed	N/A	N/A	N/A	Conductance = 0.01 – 10 day^{-1}	N/A
Aromas	1	5 - 20	165	0.05 – 1.0	0.5
Upper & Middle Paso Robles	2-3	2 - 8	11	0.01 – 0.1	0.3
Lower Paso Robles	4	2 - 8	21	0.01 – 0.1	0.01
Purisima/Santa Margarita	5	5 – 20	144	0.05 – 1.0	0.00003
Monterey	N/A	0.5	N/A	0.025	N/A

Note: Kh = horizontal conductivity and Kv = vertical conductivity.

For the PCA-West deep well, a protective elevation is established to protect the aquifer at the well location at the bottom of the Santa Margarita Formation. From the cross-sectional model sensitivity analysis (HydroMetrics LLC, 2009; Appendix C), the hydraulic conductivity of the Monterey Formation which is the unit below the protected depth has the greatest effect on the protective elevation. However, because the basinwide model does include the Monterey Formation, it cannot be used to lower the protective elevation from 17 feet MSL. Therefore, no changes to the protective elevation of the deep PCA-West well can be made based on the basinwide model.

A protective elevation is also established for the shallow PCA-West well that protects the aquifer at the well location below the Paso Robles Formation. The basinwide model indicates that the horizontal conductivity in the Purisima and Santa Margarita Formations below the protected location (Layer 5) are greater in the basinwide model than in the original cross-sectional model, suggesting that incorporating the basinwide model parameters will reduce the protective elevation. However, the overall hydraulic conductivity in the Purisima and Santa Margarita Formations below the protected location is smaller in the basinwide model than in the original cross-sectional model due to the much lower vertical conductivity in the basinwide model. Therefore, using the parameters from the basinwide model will not lower the protective elevation of the shallow PCA-West well from the already low value of 2 feet MSL

2.3 UPDATE CROSS-SECTIONAL MODELING OF MSC WELLS

Table 3 compares the original parameter ranges used in the cross-sectional models with the averages calculated from the basinwide model for the MSC wells (shallow and deep).

Table 3: MSC Well Cross-sectional Model and Basinwide Model Hydraulic Conductivities

Hydrostratigraphic Unit	Basinwide Model Layers	Cross-sectional Model Kh Range (feet per day)	Average Basinwide Model Kh (feet per day)	Cross-sectional Model Kv Range (feet per day)	Average Basinwide Model Kv (feet per day)
Seabed	N/A	N/A	N/A	Conductance = 0.01 – 10 day^{-1}	N/A
Aromas	1	5 - 20	165	0.05 – 1.0	0.5
Upper & Middle Paso Robles	2-3	2 - 8	5	0.01 – 0.1	0.1
Lower Paso Robles	4	2 - 8	6	0.01 – 0.1	0.03
Santa Margarita	5	5 – 20	18	0.05 – 1.0	0.05
Monterey	N/A	0.5	N/A	0.025	N/A

Note: Kh = horizontal conductivity and Kv = vertical conductivity.

For the deep MSC well, a protective elevation is established to protect the aquifer at the well location at the bottom of the Santa Margarita Formation. From the cross-sectional model sensitivity analysis (HydroMetrics LLC, 2009; Appendix C), the conductivity of the Monterey Formation which is the unit below the protected depth has the greatest effect on the protective elevation. However, because the basinwide model does include the Monterey Formation, it cannot be used to lower the protective elevation from 17 feet MSL. Therefore, no changes to the protective elevation of the deep MSC well can be made based on the basinwide model.

A protective elevation is also established for the shallow MSC well that protects the aquifer at the well below the Paso Robles Formation. The basinwide model indicates that the horizontal conductivity in the Santa Margarita Formation below the protected location (Layer 5) is greater in the basinwide model than in the original cross-sectional model, suggesting that incorporating the basinwide model parameters will reduce the protective elevation. However, the overall hydraulic conductivity in the Santa Margarita Formation below the protected location is smaller in the basinwide model than in the original cross-sectional model due to the lower vertical conductivity in the basinwide model. Therefore, using the parameters from the basinwide model will not lower the protective elevation at the shallow MSC well from 11 feet MSL

2.4 UPDATE CROSS-SECTIONAL MODELING OF CDM MW-4 WELL

Table 4 compares the original parameter ranges used in the cross-sectional models with the averages calculated from the basinwide model for the CDM MW-4 well.

Table 4: CDM MW-4 Well Cross-sectional Model and Basinwide Model Hydraulic Conductivities

Hydrostratigraphic Unit	Basinwide Model Layers	Cross-sectional Model Kh Range (feet per day)	Average Basinwide Model Kh (feet per day)	Cross-sectional Model Kv Range (feet per day)	Average Basinwide Model Kv (feet per day)
Seabed	N/A	N/A	N/A	Conductance = 0.01 – 10 day^{-1}	N/A
Aromas	1	5 - 20	165	0.05 – 1.0	0.5
Paso Robles	2-5	5-20	22	0.05 - 1.0	0.1
Monterey	N/A	0.5	N/A	0.025	N/A

Note: Kh = horizontal conductivity and Kv = vertical conductivity.

For the CDM MW-4 well, a protective elevation is established to protect the aquifer at the well at the bottom of the Paso Robles Formation. From the cross-sectional model sensitivity analysis (HydroMetrics LLC, 2009; Appendix C), the conductivity of the Monterey Formation which is the unit below the protected depth has the greatest effect on the protective elevation. However, because the basinwide model does include the Monterey Formation, it cannot be used to lower the protective elevation from 2 feet MSL. Therefore, no changes to the protective elevation of the CDM MW-4 well can be made based on the basinwide model.

2.5 CONCLUSIONS

The calibrated parameters in the basinwide model do not indicate that protective elevations should be lowered.

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3.0 EXTEND GROUNDWATER FLOW MODEL THROUGH 2041

To model the three Scenarios HydroMetrics WRI extended the 2012 TAC baseline model used to previously model temporarily deferring the Adjudication-required ten percent pumping reductions (HydroMetrics WRI, 2012). The baseline model originally simulated the Seaside Basin through 2030. The model was extended from 2030 through 2041 for these simulations. The year 2041 was chosen using the assumption that Cal-Am's repayment would begin in 2017, and the repayment would take 25 years.

All boundary conditions for the added simulation period are held constant at their 2030 levels. These include the general head boundaries along the coast, constant head boundaries adjacent to the Salinas Basin, and all no flow boundaries.

The same hydrology (rainfall and recharge) used in previous model runs was applied to the baseline scenario and all pumping scenarios. To extend the hydrology through the predictive period, the 1987 through 2008 hydrology data were repeated for model years 2009 through 2030, and 2031 through 2041 (Figure 1). Because there are only 22 years of hydrology data between 1987 and 2008, these 22 years have been repeated in succession through 2041. By using this hydrology, even during the period January 2009 to present when actual hydrology is known, the model runs can be used to compare relative groundwater levels but not to assess absolute Basin conditions.

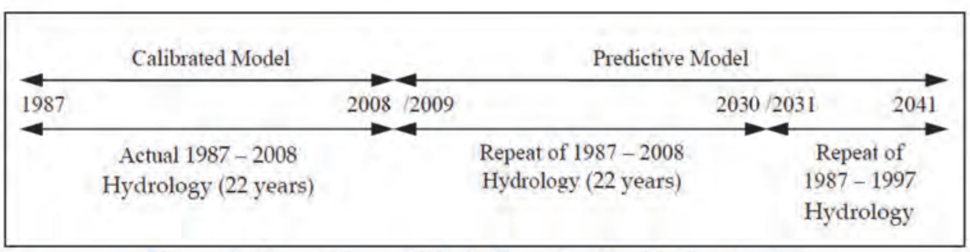


Figure 1: Repetition of Hydrology for Predictive Model

4.0 DEVELOP MODEL SCENARIOS

A subgroup of the Watermaster's Technical Advisory Committee (TAC) met by conference call on December 18, 2012 to develop modeling scenarios and discuss modeling assumptions.

Attendees on the conference call were:

Bob Jaques	Seaside Basin Watermaster
Joe Oliver	Monterey Peninsula Water Management District
John Kilpatrick	California American Water
Robert Johnson	Monterey County Water Resources Agency

The assumptions agreed upon during the call are summarized in the following sections.

4.1 BASELINE SIMULATION ASSUMPTIONS

WATER YEAR 2009 THROUGH WATER YEAR 2012 PUMPING

Actual pumping and injection data for all wells from January 2009 through December 2012 are included in the baseline.

STANDARD PRODUCER PUMPING FROM WATER YEAR 2013 ONWARDS

Standard Producer pumping follows the Decision-prescribed triennial reductions. All water injected by ASR wells is pumped from select Cal-Am wells.

GOLF COURSE PUMPING

Golf course wells pump at rates based on the hydrologic year. For example, pumping in January 2015 equals the amount pumped in January 1993, because the simulated 2015 hydrology is based on 1993 hydrology. This ensures that the demand corresponds to the hydrology. If the amount pumped by a Producer pre-adjudication exceeded the Producer's adjudicated right, pumping was capped at the Producer's adjudicated amount.

Additional golf course pumping adjustments accounted for in the baseline simulation are:

- The Bayonet and Blackhorse golf courses pump no water until September, 2016. This is based on an in-lieu replenishment program the City of Seaside has with its golf course pumping. Under this program, Marina Coast Water District provides water in-lieu of the City pumping from the Seaside Basin. The City expects to start pumping its golf course wells again starting September 2016.

- In 2007, Bayonet and Black Horse golf courses had irrigation upgrades that have reduced irrigation demand by approximately 10% from historical amounts.

- The City of Seaside expects to begin pumping an average of 360 AFY from its wells for golf course supply starting in September 2016. These projected quantities were used rather than basing demand on the hydrology year.

Alternative Producer and Private Pumping

Alternative Producers, excluding golf courses, pump at their Water Year (WY) 2011 volumes from WY 2013 onwards. All other pumpers that are not covered by the Decision, including Cal Water Service and private wells, also pump at WY 2011 volumes from WY 2013 onwards.

Pumping exceptions taken into account in the baseline are:

- Water for SNG, which is an Alternative Producer, is supplied from Cal-Am wells under an agreement with Cal-Am. When the SNG site is developed they will be supplied with water by Cal-Am, who will use SNG's water right of 149.7 acre-feet/year. Currently there is no production from the SNG well. Based on input from the property owner, Ed Ghandour, project construction is planned to start in 2013 with 25 AFY water usage. Water usage thereafter is estimated to be:
    - 2014 - 30 AFY
    - 2015 – 50 AFY
    - 2016 onwards – 70 AFY

INJECTION AND EXTRACTION OF INJECTED WATER

From WY 2013 onwards, a combined volume of 1,445 acre-feet per year was injected into four aquifer storage and recovery (ASR) wells in accordance with their permitted amounts. The same amount of 1,445 acre-feet per year is extracted back out annually by Cal-Am production wells in the Northern Coastal subarea.

4.2 SCENARIO 1: CAL-AM'S TWENTY-FIVE YEAR REPLENISHMENT REPAYMENT SIMULATION ASSUMPTIONS

The 25 year replenishment scenario includes the same pumping rates as the baseline with the exception of Cal-Am's wells. Beginning in January 2017, Cal-Am pumps only 774 AFY of its allotted natural safe yield of 1,474 AFY. The 700 AF not being pumped over a 25 year period is Cal-Am's replenishment repayment. The reduced pumping is distributed among Cal-Am wells relative to the amount each well pumps as a percentage of monthly pumping. Table 5 summarizes the production information for each scenario.

All other model assumptions are identical to those of the baseline scenario as summarized in Table 5.

4.3 SCENARIO 2: TWENTY-FIVE YEARS TO ACHIEVE PROTECTIVE ELEVATIONS SIMULATION ASSUMPTIONS

In this simulation, pumping is iteratively reduced throughout the basin to estimate the annual pumping that allows groundwater levels to reach protective elevations in the four coastal monitoring well locations after 25 years. Pumping is first reduced for all Standard Producers, in proportion to their pumping amounts. If Standard Producers production reaches zero without protective elevations being met, Alternative Producer pumping is reduced in proportion to their pumping amounts. The pumping reductions do not affect the annual recovery of injected water: Cal-Am continues to recover 1,445 acre-feet per year of water injected by the ASR wells.

The pumping assumptions for this scenario are summarized in Table 5.

4.4 Scenario 3: Reduced Cal-Am Pumping with Injection Simulation Assumptions

In this simulation, injection is iteratively added to existing ASR wells to estimate the amount of injection that allows groundwater levels to reach protective elevation in the four coastal monitoring well locations after 25 years. Beginning with the pumping rates defined in Scenario 2: Cal-Am Twenty-Five Year Replenishment, injection is iteratively added in existing ASR wells 1 through 4 until protective levels are reached after 25 years. The increased injection begins in December of 2016 and is applied at a constant rate in ASR wells 1 through 4 for the months of December through May. The injected water is divided evenly between the four injection wells.

The pumping assumptions for the three scenarios are summarized in Table 5.

Table 5: Model Simulation Summary

	Baseline	Scenario 1: Cal-Am's 25 Year Replenishment Scenario	Scenario 2: 25 Years to Achieve Protective Elevations Scenario	Scenario 3: Reduced Cal-Am Pumping with Injection Scenario
Standard Producers	Pump full adjudicated right with triennial reductions	Cal-Am pumps only 774 AFY for 25 years, starting in January 2017	Iteratively reduce production. Cal-Am continues to recover 1,445 AFY of injected water	Cal-Am pumps only 774 AFY for 25 years, starting in January 2017. Iteratively increase ASR well injection
Alternative Producers	Pump at WY 2011 rates	Pump at WY 2011 rates	Iteratively reduce to zero production	Pump at WY 2011 rates
SNG	Cal-Am pumps SNG required water	Cal-Am pumps SNG required water	Iteratively reduce to zero production	Cal-Am pumps SNG required water

5.0 MODEL RESULTS

The model assumptions discussed above were integrated into the Seaside Basin groundwater flow model, and the model was run separately for each simulation. Results of the model runs are presented in the sections below. The first section below discusses the ability of each simulation to reach protective elevations at coastal monitoring wells. The second section below discusses each simulation's impact on seawater intrusion rates.

5.1 GROUNDWATER LEVELS AT COASTAL MONITORING WELLS

The simulated groundwater elevations for each scenario were evaluated in six monitoring wells used for establishing protective elevations against seawater intrusion (HydroMetrics LLC, 2009). These monitoring wells are: MSC Deep, MSC Shallow, PCA-West Deep, PCA-West Shallow, Sentinel Well 3, and CDM MW-4 (Figure 2).

The protective elevations at each well were used as a benchmark for comparing the relative success of each scenario at achieving protective elevations. Simulated hydrographs for the baseline scenario and three model scenarios are provided in Figure 3 through Figure 5. In these figures, the hydrographs for well CDM MW-4 appear significantly different from the other hydrographs because well CDM MW-4 is very shallow and is located in a different model layer and hydrostratigraphic layer than the other wells. The spikes observed in the CDM MW-4 hydrograph are a response to recharge occurring during winter months. This behavior is not observed in the deeper wells where groundwater levels are less sensitive to seasonal and inter-annual variations in rainfall and recharge. Additionally, the groundwater elevation scale is different than the scales on the other plots.

SCENARIO 1: CAL-AM'S 25 YEAR REPLENISHMENT SCENARIO

Under Cal-Am's 25 year replenishment scenario, the model predicts some additional recovery above the baseline scenario, but not enough to bring any groundwater levels up to protective elevations (Table 6). Groundwater levels recover 1 to 1.5 feet in the shallow wells and approximately 3 feet in the deep wells by the end of this scenario (Table 7). As expected, there is almost no recovery in CDM-MW-4 because it is very shallow and Cal-Am's pumps from deeper aquifers.

SCENARIO 2: ACHIEVING PROTECTIVE ELEVATIONS SCENARIO

Significant pumping reductions were required for the model to achieve protective elevations in all six monitoring wells. This could only be attained by ceasing all pumping from both Standard and Alternative Producers, with the exception of 1,445 AFY recovered by Cal-Am from injection. Under this scenario, the MSC Deep well, PCA-W Deep well, and CDM-MW-4 well all just reach protective levels in the final year (2041) of the simulation. The MSC Shallow well and Sentinel Well 3 reach protective elevations sooner than the end of the simulation period. Table 6 summarizes the approximate dates protective elevations are met in each monitoring well. The average groundwater level differences between the scenarios and baseline at the end of the simulations are shown in Table 7.

Table 6: Summary of Protective Elevation Acheivement

Scenario	MSC Deep	MSC Shallow	PCA-West Deep	PCA-West Shallow	Sentinel-3	CDM MW-4
Baseline	Not achieved	Not achieved	Not achieved	Already achieved	Not achieved	Not achieved
Scenario 1: 25 Year Cal-Am Replenishment Scenario	Not achieved	Not achieved	Not achieved	Already achieved	Not achieved	Not achieved
Scenario 2: 25 Years to Achieve Protective Elevations Scenario	Achieved in 2041	Achieved in 2032	Achieved in 2041	Already achieved	Achieved in 2022	Achieved in 2041
Scenario 3: 25 Year Cal-Am Replenishment Scenario with Additional Water Injection	Achieved in 2030	Achieved in 2041	Achieved in 2034	Already achieved	Achieved in 2022	Achieved in 2041

Table 7: Average Groundwater Elevation Difference at the End of Simulation (Scenario- Baseline)

Scenario	MSC Deep	MSC Shallow	PCA-West Deep	PCA-West Shallow	Sentinel-3	CDM MW-4
Scenario 1: 25 Year Cal-Am Replenishment Scenario	2.9	1.6	3.0	1.2	3.0	0.05
Scenario 2: 25 Years to Achieve Protective Elevations Scenario	17.1	5.0	19.3	3.7	18.7	0.3
Scenario 3: 25 Year Cal-Am Replenishment Scenario with Additional Water Injection	18.8	3.9	22.2	2.6	21.3	0.1

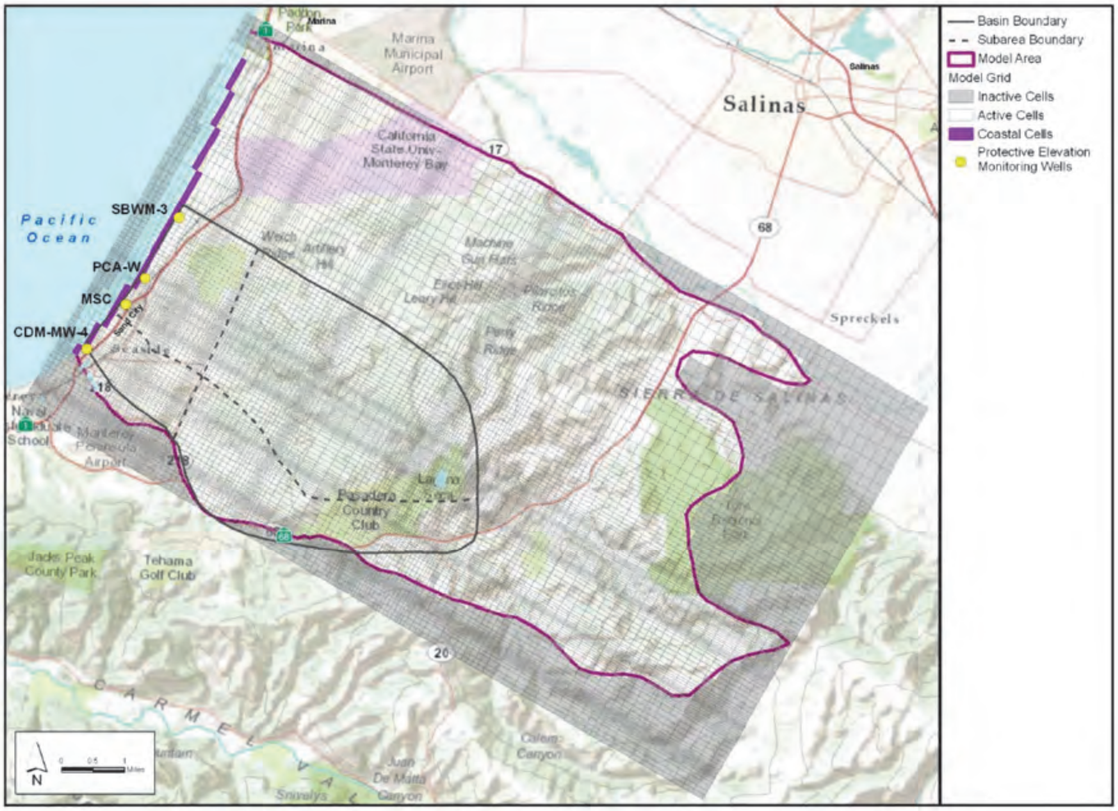
Ceasing pumping in all Standard and Alternative Producer wells has the greatest effect on the deep monitoring wells' groundwater levels, allowing them to recover substantially. This is because the production wells with the greatest production are completed in the deeper aquifers.

SCENARIO 3: REDUCED CAL-AM PUMPING WITH INJECTION SCENARIO

An additional 1,000 AFY of water injected in ASR wells 1 through 4 was found to achieve protective elevations in all six coastal monitoring wells by 2041. This amount is in addition to the 1,445 AFY currently injected in ASR wells 1 through 4, for a total injection rate of 2,445 AFY. Unlike the 1,445 AFY stored and recovered in the aquifer by Cal-Am, the additional 1,000 AFY is allowed to remain in the aquifer without being pumped out.

The timing of the groundwater level recovery under this scenario is very similar to that predicted in Scenario 2: 25 Years to Achieve Protective Elevations, with the most noticeable difference being in the greater seasonal fluctuations that occur with the greater rates of injection.

The similar groundwater level responses seen under the reduced pumping and increased injection scenarios are achieved with different amounts of water. Under Scenario 2: 25 Years to Achieve Protective Elevations, pumping was reduced by just over 2,000 AFY before protective levels were met, while Scenario 3: Reduced Cal-Am Pumping with Injection requires only 1,000 AFY of additional injection to meet protective elevations. The greater efficiency of the injection approach is likely due to its placement of water directly into the layer in which the most slowly recovering monitoring wells are located.


Basin Boundary
Subarea Boundary
Model Area
Model Grid
Inactive Cells
Active Cells
Coastal Cells
Protective Elevation Monitoring Wells
Pacific Ocean
SBWM-3
PCA-W
MSC
CDM-MW-4
Salinas
Marina Municipal Airport
California State Univ-Monterey Bay
Spreckels
SIERRA DE SALINAS
Pasadera Country Club
Monterey Peninsula Airport
Jacks Peak County Park
Tehama Golf Club
Seaside
N

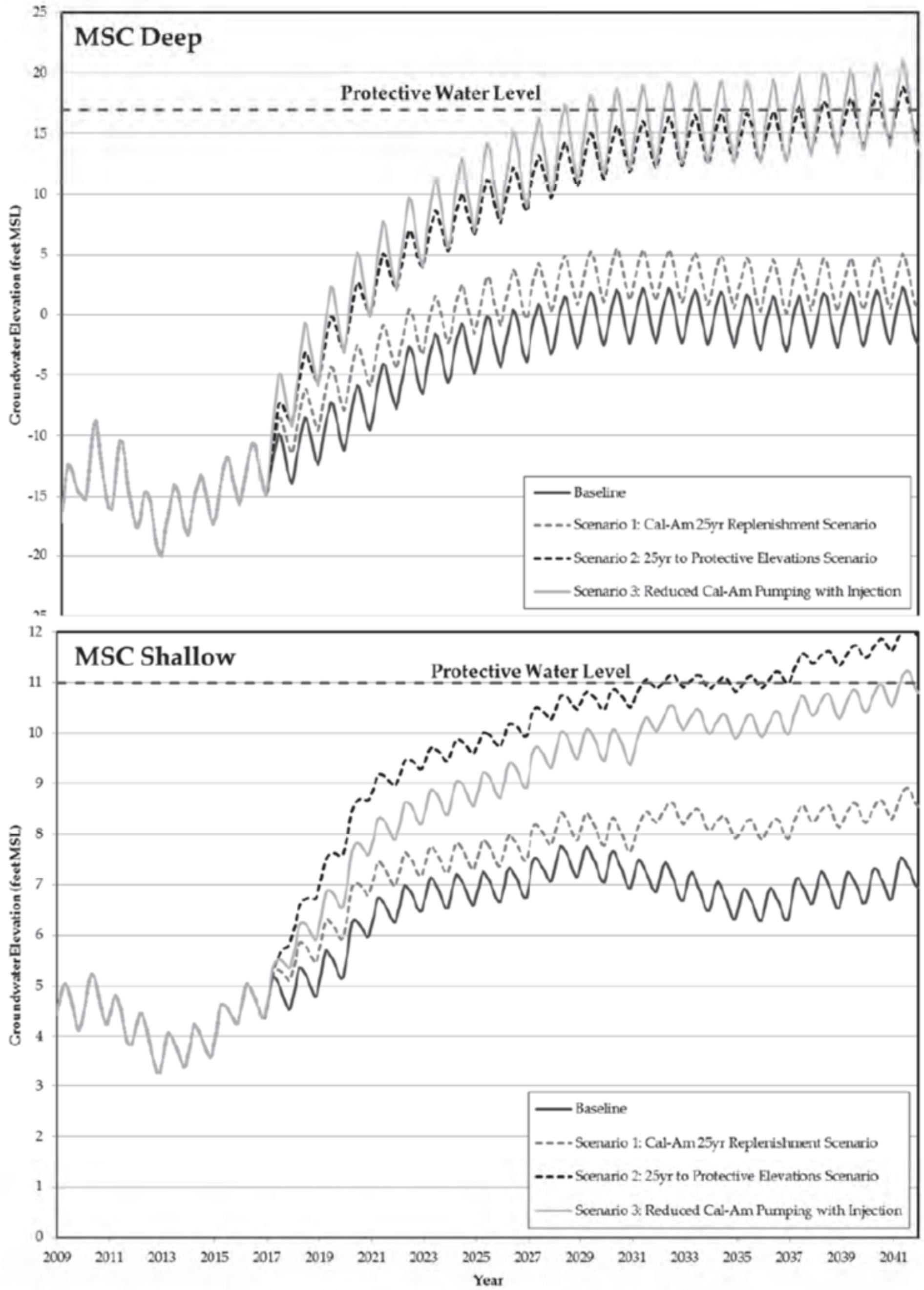


Figure 3: Predicted Groundwater Elevations and Protective Elevations for the MSC Wells

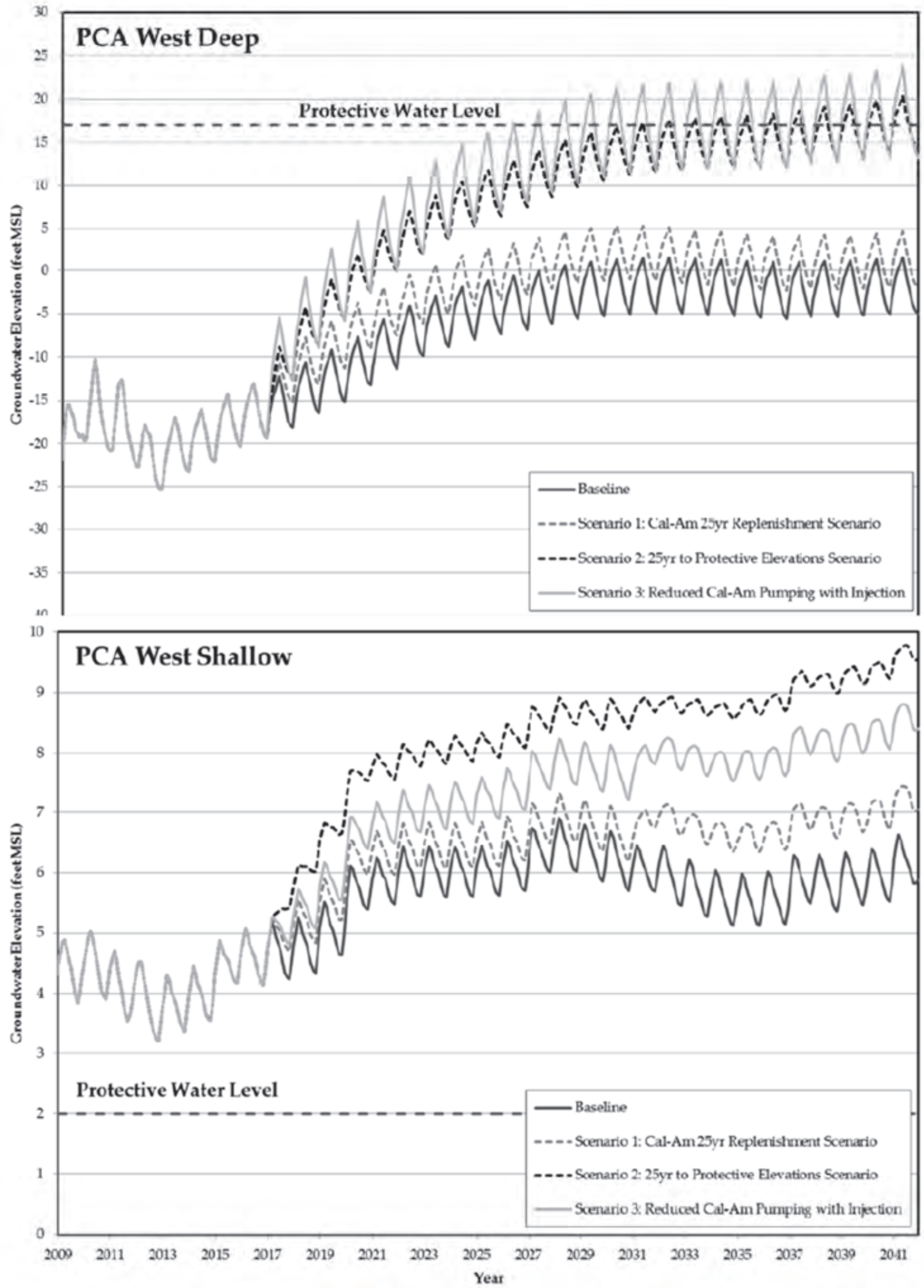


Figure 4: Predicted Groundwater Elevations and Protective Elevations for the PCA West Wells

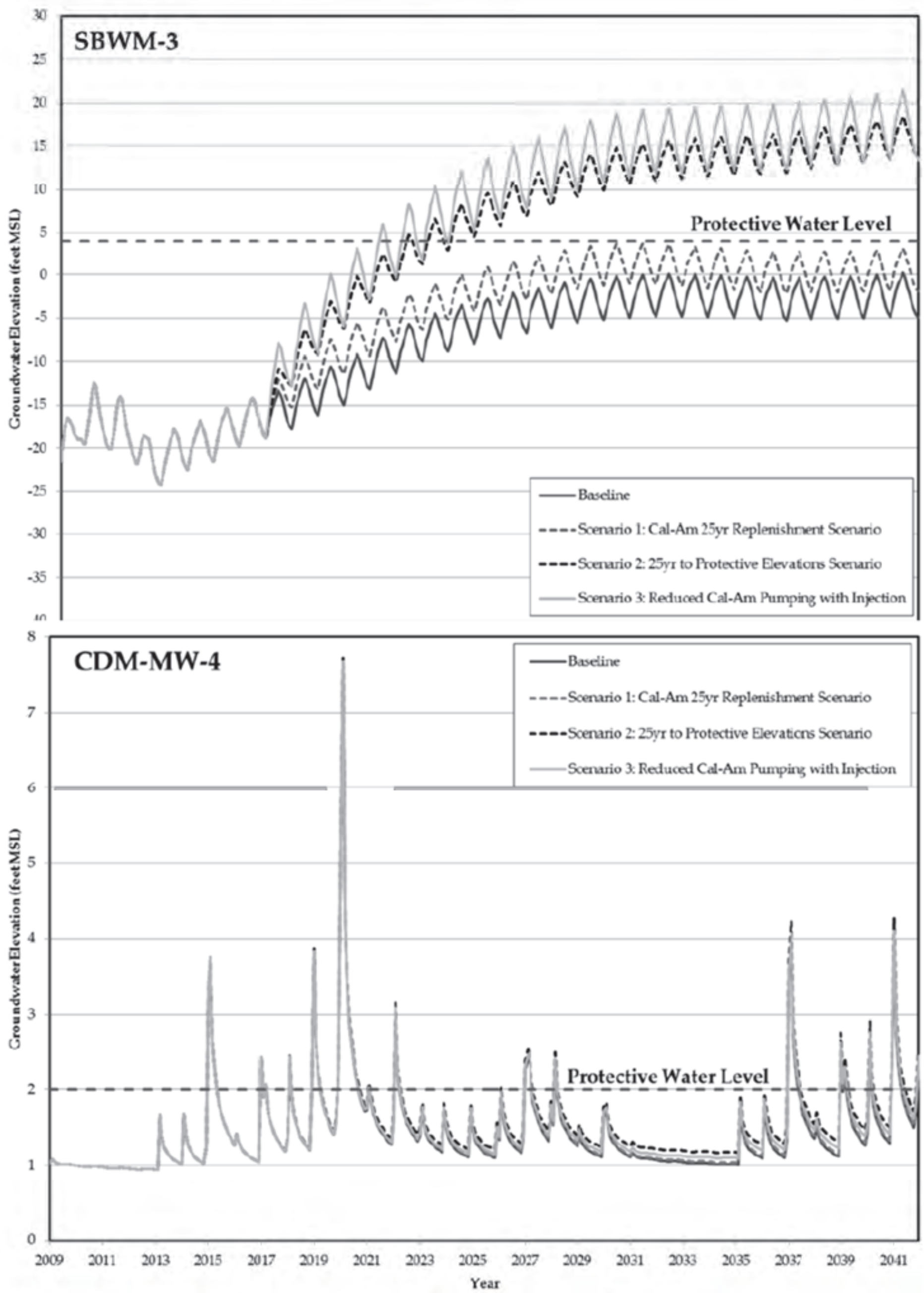


Figure 5: Predicted Groundwater Elevations and Protective Elevations for Sentinel Well 3 (SBWM-3) and CDM MW-4 Wells

The total production by Water Year for the baseline and the three scenarios is shown on Figure 6. Scenario 2 (25 years to achieve Protective Elevations) found that a reduction of just over 2,000 acre-feet per year in baseline pumping is required over a 25 year period to achieve protective groundwater elevations in all wells. The baseline and Scenario 1 (Cal Am's 25 year replenishment) vary year to year because of golf course pumping which varies due to hydrologic demand (see Section 4.1). A constant pumping rate occurs for Scenario 2 (25 year to achieve protective elevations) because the only pumping taking place is to extract 1,445 acre-feet per year of injected ASR water. Scenario 3 (Cal Am's 25 year replenishment with additional injection water) has the same pumping rates as Scenario 1, but 1,000 AFY of additional water is injected at the existing ASR wells and left in the basin.

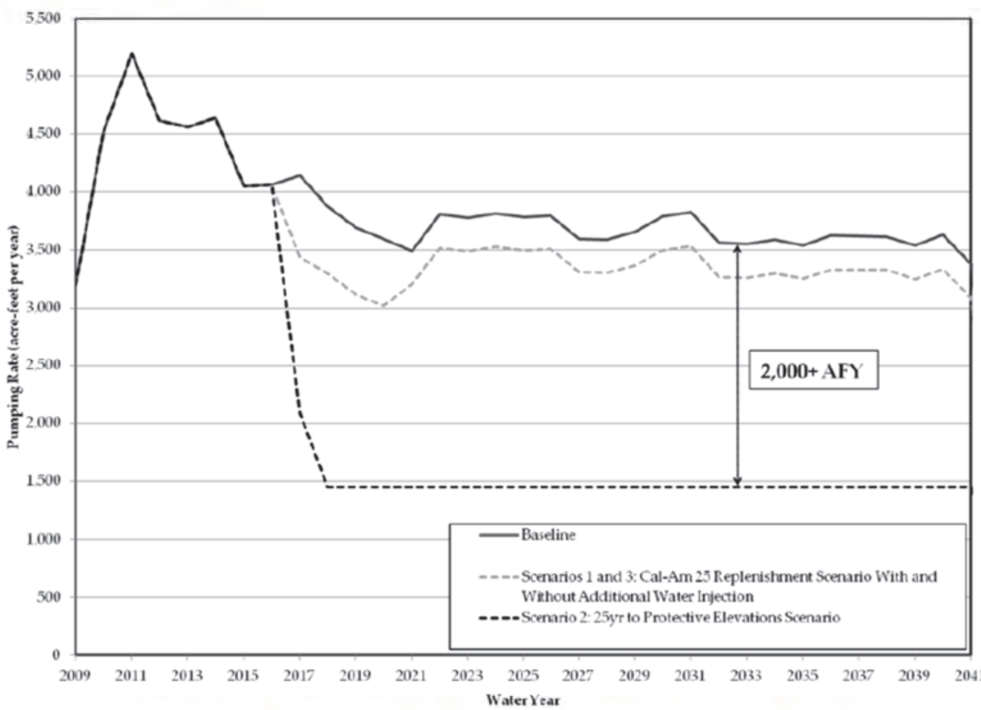


Figure 6: Modeled Production for Baseline and Scenarios

5.2 Potential Seawater Intrusion Rate

Although no seawater intrusion has occurred in the basin, potential seawater intrusion rates were determined based on groundwater velocities along the coastline. The following calculations were used to estimate average groundwater velocities from the groundwater flow model for Scenarios 1 and 2:

- Model cells that represent the coastline were identified. These cells are shown on Figure 2.
- To establish the change in coastal groundwater velocities between the first year of pumping reductions (2017) and the end of the simulation period (2041), the onshore and offshore velocities for the 12 months comprising each of the years (2017 and 2041) were averaged. This approach rather than averaging the entire simulation was taken so as to highlight the actual change in velocities. An average for the 25 year period would be too generalized and not provide an understanding of the velocities achieved by the end of the simulations. This is particularity important for the 25 year to achieve protective elevations scenario.
- The average groundwater flows were combined with an assumed effective porosity of 0.20 to obtain average groundwater velocities.
- The difference in potential seawater intrusion rates from 2017 to 2041 are shown in Table 8 (Scenario 1: Cal-Am's 25 year replenishment) and Table 9 (Scenario 2: 25 years to achieve protective elevations). These tables summarize the velocities for each model layer and for all layers combined.

For Scenario 1 (Cal-Am's 25 year replenishment), the average flow direction in each model layer changes from onshore to offshore flows, except in Layer 4 (Table 8). For Scenario 2 (25 years to achieve protective elevations), the average flow direction in each model layer changes from onshore to offshore flow (Table 9). The offshore flows in this simulation are greater than the offshore flows Scenario 1.

Although as summarized in Table 9, the average flows for Layer 4 are offshore in this scenario, there is still some onshore flow occurring along the coast. This is illustrated in Figure 7 where Layer 4's (Paso Robles Formation) coastal flows in 2017 are shown on the left panel and 2041's on the right panel. At the end of the simulation when protective elevations are achieved, onshore flow is not completely eliminated. The reason for the perceived discrepancy between the maps and the average is due to the averaging process which averages onshore and offshore velocities. Even if the number of cells with onshore flow outnumber the number of cells with offshore flow, the average flows can still be calculated as offshore if the offshore velocities are greater than the onshore velocities.

Another complication with interpreting the flow velocity results is that the groundwater flow model determines onshore and offshore flows based on different criteria than the cross-sectional models that were used to develop the protective groundwater elevations. Theoretically, there should be no onshore flows in the vicinity of the protective elevation wells for it to achieve protective elevations. But because Figure 7 shows onshore flow occurring when the groundwater levels in the cross-sectional model are protective, it proves that using the groundwater flow model to quantify flow velocity is not a suitable metric when groundwater levels are at protective elevations. Due to these reasons, velocities for Scenario 3: Cal Am's 25 year replenishment with additional injection water, were not estimated and included in this report.

Table 8: Average Groundwater Flow Rate Differences for Scenario 1: Cal-Am's 25 Year Replenishment

		Baseline* (feet/year)		Scenario 1* (feet/year)		Difference** (feet/year)	
		2017	2041	2017	2041	2017	2041
1	**Aromas and Older Dune Deposits**	-147.78	-208.90	-148.87	-228.55	-1.09	-19.65
2	**Paso Robles**	0.52	-1.09	0.48	-1.81	-0.04	-0.72
3	**Paso Robles**	4.04	0.87	3.85	-0.91	-0.19	-1.06
4	**Paso Robles**	30.63	20.21	28.91	12.80	-1.72	-7.41
5	**Santa Margarita/Purisima**	0.57	-0.48	-0.77	-0.82	-1.34	-0.34
	All Layers	**-6.22**	**-15.27**	**-7.40**	**-19.18**	**-1.18**	**-3.91**

* Negative Baseline or Scenario is offshore flow, positive Baseline or Scenario is onshore flow
** Negative difference indicates velocity of the scenario is less than the baseline

Table 9: Average Groundwater Flow Rate Differences for Scenario 2: 25 Years to Achieve Protective Elevations

		Baseline* (feet/year)		Scenario 2* (feet/year)		Difference** (feet/year)	
		2017	2041	2017	2041	2017	2041
1	Aromas and Older Dune Deposits	-147.78	-208.90	-156.71	-325.50	-8.93	-116.60
2	Paso Robles	0.52	-1.09	0.33	-4.68	-0.19	-3.59
3	Paso Robles	4.04	0.87	3.03	-8.69	-1.01	-9.56
4	Paso Robles	30.63	20.21	26.52	-3.99	-4.11	-24.20
5	Santa Margarita/Purisima	0.57	-0.48	-2.14	-3.20	-2.71	-2.72
	All Layers	**-6.22**	**-15.27**	**-9.44**	**-32.40**	**-3.22**	**-17.13**

* Negative Baseline or Scenario is offshore flow, positive Baseline or Scenario is onshore flow
** Negative difference indicates velocity of the scenario is less than baseline


2017
2041
Pacific Ocean
SBWM-3
PCA-W
MSC
Sand City
Basin Boundary
Subarea Boundary
Protective Elevation Monitoring Wells
Faults
Groundwater Flow Direction
Inflow or Neutral
Outflow

6.0 CONCLUSIONS

1. The calibrated parameters in the basinwide model do not indicate that protective elevations should be lowered. The protective elevations developed in 2009 remain reasonable targets for groundwater management.

2. Scenario 1: Cal-Am's proposed 25 year replenishment repayment, increases groundwater elevations by 1 to 1.5 feet in the shallow aquifer coastal wells and 3 feet in the deep aquifer coastal wells. These increases do not achieve protective elevations.

3. Scenario 2: Eliminating all Standard and Alternative Producer pumping for 25 years starting in January 2017 will allow protective elevations to be met at the end of the 25 year period. This will require an overall pumping reduction of just over 2,000 acre-feet per year.

4. Scenario 3: When combined with Cal-Am's 25 year repayment schedule, protective elevations can be realized by injecting an additional 1,000 acre-feet per year of water into the existing ASR wells. Recharged water is left in the basin, and not pumped by Standard or Alternative producers. This approach requires less water to implement than the pumping reduction approach of Scenario 2.

5. Potential intrusion rates for Scenarios 1 and 2 are slower than baseline intrusion rates. Scenario 2, which achieve protective elevations within 25 years, has onshore flow rates of about half the rate Scenario 1.

6. For Scenario 1, all model layer average flows changed from onshore to offshore, except Layer 4. For Scenario 2 average flows are offshore for all model layers.

7. Using the groundwater flow model to quantify flow velocities and direction is not an accurate metric when groundwater levels are at protective elevations because it simulates flow direction based on different criteria than the cross-sectional model that was used to estimate protective groundwater elevations.

7.0 REFERENCES

HydroMetrics LLC. 2009. Groundwater modeling and protective groundwater elevations. Prepared for Seaside Basin Watermaster. November 2009.

HydroMetrics WRI. 2012. Groundwater modeling results of temporary suspension of triennial pumping reductions. Technical memorandum to the Seaside Groundwater Basin Board of Directors. September 28.

MONTGOMERY & ASSOCIATES
Water Resource Consultants

DRAFT TECHNICAL MEMORANDUM

DATE:	August 5, 2022	PROJECT #: 9150.0507
TO:	Bob Jaques, Technical Program Manager, Seaside Basin Watermaster	
FROM:	Pascual Benito, Ph.D.	
PROJECT:	Seaside Basin Watermaster	
SUBJECT:	Hybrid Water Budget Analyses of Basin Replenishment Options & Alternate Assumptions	

INTRODUCTION

This technical memorandum (TM) documents:

1) Results of a water budget analysis of the January 2022 Baseline and 1,000 AFY Replenishment scenario simulations (M&A, 2022a; 2022b).

2) Development of an alternative set of baseline supply and demand assumptions based primarily on Cal-Am's Urban Water Management Plan (UWMP), with some additional assumptions provided by Cal-Am and the City of Seaside.

3) Development and results of a hybrid water-budget approach to evaluate the impact of the alternate set of future supply and demand assumptions has on the volume of replenishment water that would be needed to reach protective elevations in the coastal monitoring wells.

The hybrid water budget analysis leverages information derived from recent replenishment modeling documented in the Draft Technical Memorandum titled "Updated Modeling of Seaside Basin Replenishment Options", dated January 28, 2022 (M&A, 2022a). That study used the Seaside Watermaster groundwater model to estimate how much replenishment injection would be needed to achieve protective elevations in the Watermaster coastal protective elevation wells. Well locations are shown on Figure 1.

The water budget analysis framework provides an overview of the net inflows and outflows to the Shallow and Deep Aquifers in the Northern Coastal Subarea, which are then used to evaluate the impacts of different demand and supply assumptions on the estimated amounts of replenishment water needed to achieve the same degree of groundwater level increases in the coastal protective elevation wells already simulated in the Baseline (shown on Figure 2).

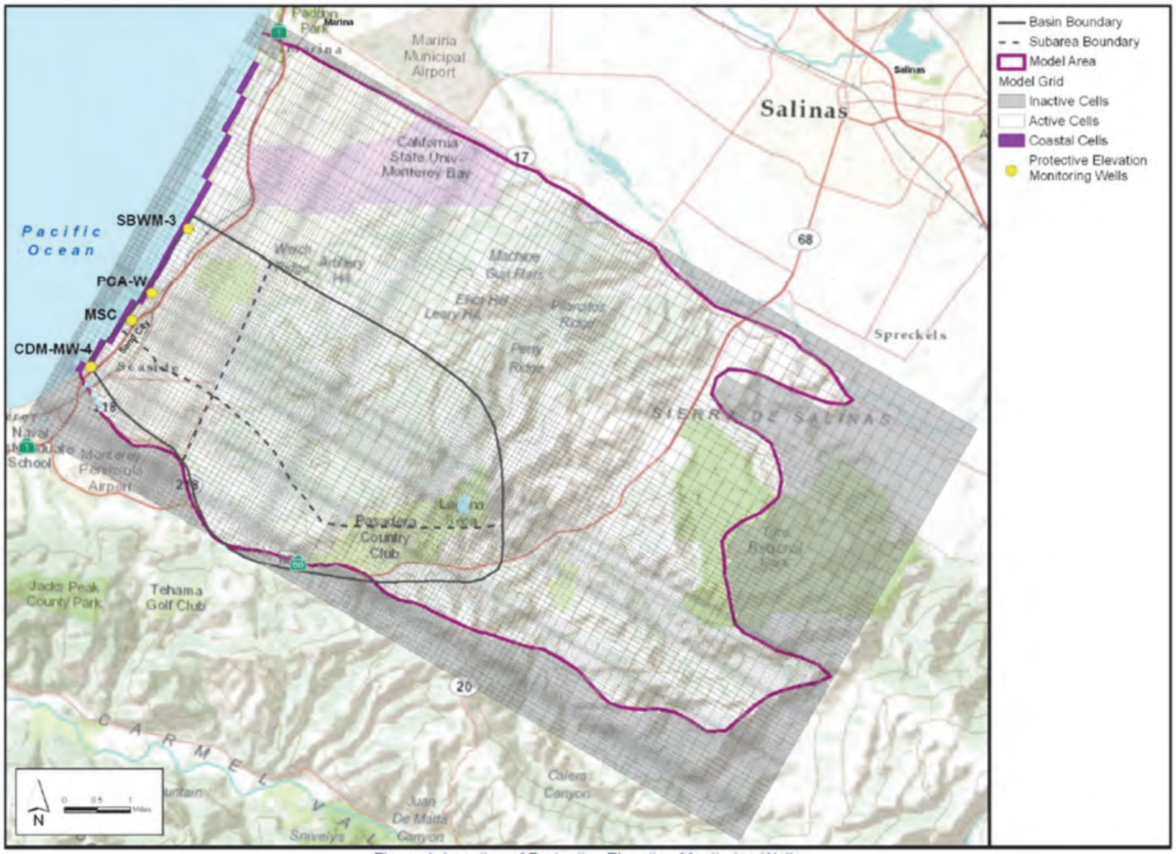


Figure 1. Location of Protective Elevation Monitoring Wells

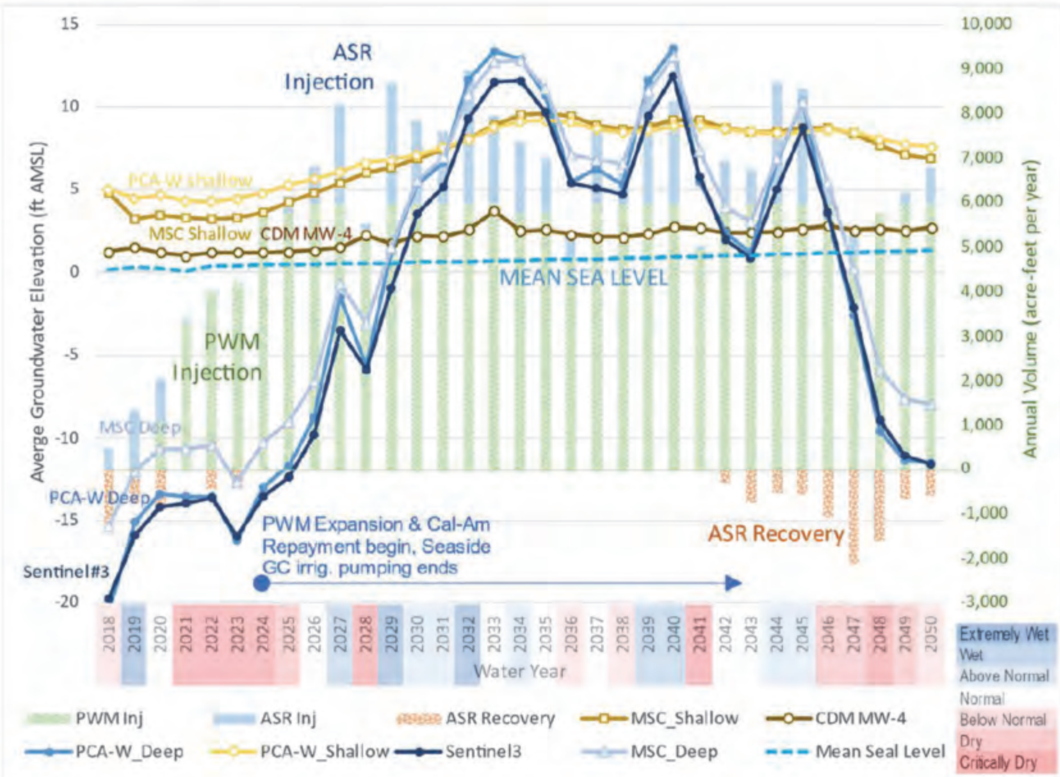


Figure 2. Annually Averaged Groundwater Elevations in Protective Elevation Wells Compared to PWM and ASR Injection and ASR Recovery (Right Axis) for the Baseline Simulation

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For context a summary of the main assumptions and setup of the Baseline model simulation are provided below.

ASSUMPTIONS FOR BASELINE SIMULATION

In this TM the term "Baseline simulation" refers to the simulation of future conditions assuming only operation of currently planned projects with no additional replenishment added. Baseline simulation represents recent conditions from water year (WY) 2018 through 2021 based on actual measured pumping, injection, and hydrology; and projected potential future conditions from WY 2022 through WY 2050 based on projected pumping, currently planned projects, and a repeated historical hydrology record. The Baseline simulation hydrology (rainfall, recharge, and streamflow) is illustrated on Figure 3.

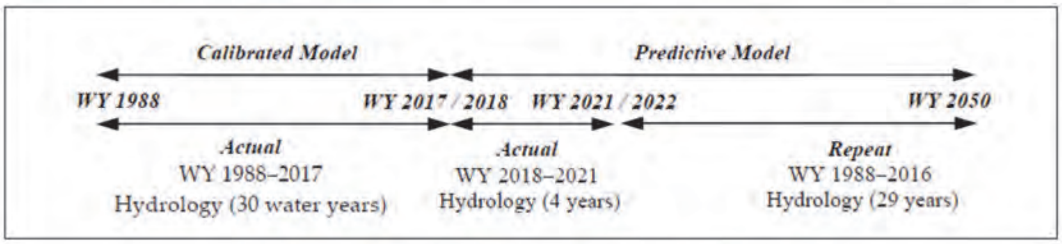

Figure 3: Repetition of Hydrology for Predictive Model

The Baseline simulation includes:

- A new extended hydrology period with 2 multi-year drought periods
- Projected mean sea level rise of up to 1.3 feet by 2050
- Seaside Aquifer Storage and Recovery (ASR) injection of Carmel River water, which is tied to the cycled hydrology and the assumption that planned upgrades to the Cal-AM Carmel Valley wellfield are completed by WY 2024
- Cal-Am's 25 year 700 AFY in-lieu replenishment begins in WY 2024
- Pure Water Monterey (PWM) Expansion project (tied to the new hydrology) begins deliveries in WY 2024 and delivers and annual average of 5,700 AFY
- Other planned projects including the City of Seaside's replacement of groundwater with recycled water for golf course irrigation in WY 2024 and the construction of the Security National Guaranty (SNG) and Campus Town developments in the City of Seaside occur
- No other sources of replenishment water are provided to the basin

- The assumption that no proposed Groundwater Sustainability Plan (GSP) projects are implemented in the neighboring coastal Monterey and 180/400 Foot Subbasins, such that groundwater levels along the northern boundary of the Model (located close to the boundary between those two subbasins) remain unchanged as currently represented in the Model boundary conditions.

Table 1 provides a listing of the simulated Carmel River Water Year types, data sources, and major project events. The color coding of the Carmel River Water Year Type classification (blues for wet and above normal water years, white for normal years, and reds for below normal and dry years), is used throughout the figures to identify water year types. A complete description of the baseline simulation assumptions and output is provided in the recent replenishment modeling and seawater intrusion travel time modeling technical memorandums (M&A, 2022a and 2022b).

Table 1. Annual Summary of Updated Baseline Simulation Water Year Types, Data Sources, and Major Project Events

Sim Year	Water Year	Carmel River WY Type	Hydrology Source WY	Pumping & Injection	Cal-Am Repayment Period	Projects Timeline
1	2018	Below Normal	Actual	Actual		
2	2019	Extremely Wet	Actual	Actual		
3	2020	Normal	Actual	Actual		**PWM Base Project Begins (3,500 AF&)**
4	2021	Critically Dry	Actual	Actual		**Cal-Am ceases pumping in Laguna Seca**
5	2022	Critically Dry	1988	Projected		**PWM ramps up to 4,100 AFY**
6	2023	Critically Dry	1989	Projected		**Seaside Golf Courses shift to PWM water**, Campus Town starts up (100 AFY)
7	2024	Critically Dry	1990	Projected	1	**PWM Expansion Begins (5,750 AFY)**, Campus Town ramp up (130 AFY)
8	2025	Dry	1991	Projected	2	SNG starts up (25 AFY), Campus Town ramps up (215 AFY)
9	2026	Normal	1992	Projected	3	SNG ramps up (30 AFY), Campus Town full capacity (301 AFY)
10	2027	Wet	1993	Projected	4	SNG ramps up (50 AFY)
11	2028	Critically Dry	1994	Projected	5	SNG full Capacity (70 AFY)
12	2029	Extremely Wet	1995	Projected	6	
13	2030	Above Normal	1996	Projected	7	
14	2031	Above Normal	1997	Projected	8	
15	2032	Extremely Wet	1998	Projected	9	
16	2033	Normal	1999	Projected	10	
17	2034	Above Normal	2000	Projected	11	
18	2035	Normal	2001	Projected	12	
19	2036	Below Normal	2002	Projected	13	
20	2037	Normal	2003	Projected	14	
21	2038	Below Normal	2004	Projected	15	
22	2039	Wet	2005	Projected	16	
23	2040	Wet	2006	Projected	17	
24	2041	Critically Dry	2007	Projected	18	
25	2042	Normal	2008	Projected	19	
26	2043	Normal	2009	Projected	20	
27	2044	Above Normal	2010	Projected	21	
28	2045	Above Normal	2011	Projected	22	
29	2046	Dry	2012	Projected	23	
30	2047	Dry	2013	Projected	24	
31	2048	Critically Dry	2014	Projected	25	**Potential Final Year of Cal-Am Repayment Period**
32	2049	Dry	2015	Projected		
33	2050	Below Normal	2016	Projected		

TASK 1. WATER BUDGET ANALYSIS OF BASELINE SIMULATION AND 1,000-AFY REPLENISHMENT SCENARIO

The water budget analysis is focused on a portion of the Seaside subbasin delineated by the Northern Coastal Subarea and a smaller triangular wedge of the adjacent Northern Inland Subarea that includes the entire footprint of the Pure Water Monterey Base and its proposed Expansion injection facilities and backflush percolation ponds. This water budget zone is shaded red on Figure 4. The map also shows the other water budget zones defining the adjacent subareas of the Seaside subbasin, the neighboring Monterey Subbasin, and the Offshore region. This water budget zone was further divided vertically based on the model layering[1] into the Shallow Aquifers (consisting of model layers 1-4) and the Deep Aquifer (consisting of model layer 5). The groundwater model results of the Baseline simulation and the 1,000-AFY Replenishment scenario were processed to calculate and track all the different inflows and outflows of water to and from each water balance zone over the entire simulation period. The monthly inflows and outflows to each zone were then aggregated over each water year for presentation. The results for each scenario are presented below.

[1] Layer 1 = Aromas Sands & Older Dune Deposits; Layer 2 = Upper Paso Robles, Layer 3 = Middle Paso Robles; Layer 4 = Lower Paso Robles; Layer 5 = Santa Margarita & Purisima

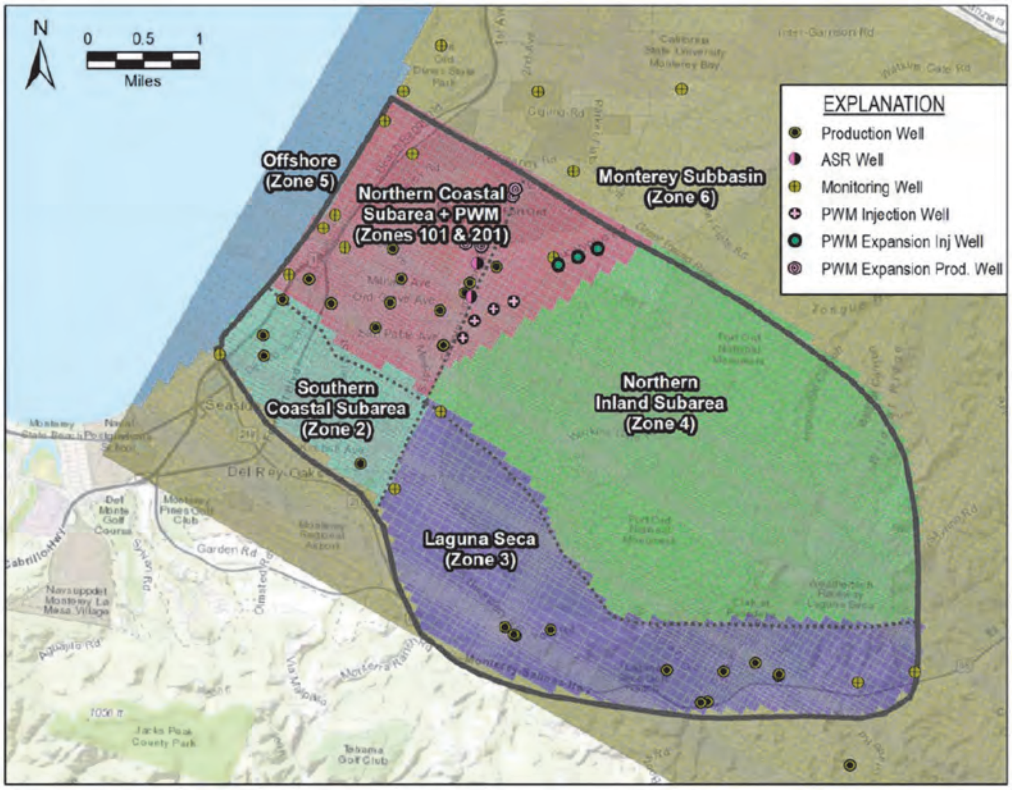

Figure 4. Map of Water Balance Zones used for Water Budget Analysis

Baseline Scenario

Shallow Aquifers Water Budget

Net Flows

Figure 5 shows the net flows to and from the Shallow Aquifer in the Northern Coastal Subarea and PWM Expansion area. The flow components include:

- Deep percolation from infiltration of rainfall, irrigation return flow, and system losses
- Vadose Zone Recharge from PWM vadose zone wells and percolation ponds
- Pumping from extraction wells
- Flow to/from the Northern Inland Subarea upgradient of the PWM project wells
- Flow to/from the Southern Coastal Subarea
- Flow to/from the Offshore regions of the Shallow Aquifer
- Flow to/from the underlying Deep Aquifer
- Flow to/from the neighboring Monterey Subbasin

For each flow component, net flow is calculated as the difference between total inflow and total outflow, such that positive values represent net inflows to the Shallow Aquifers and negative values represent net outflows. The direction of flow to/from adjacent areas or aquifers is dependent on the relative head gradient between the Shallow Aquifers and those areas or aquifers, and so can change flow directions and groundwater levels.

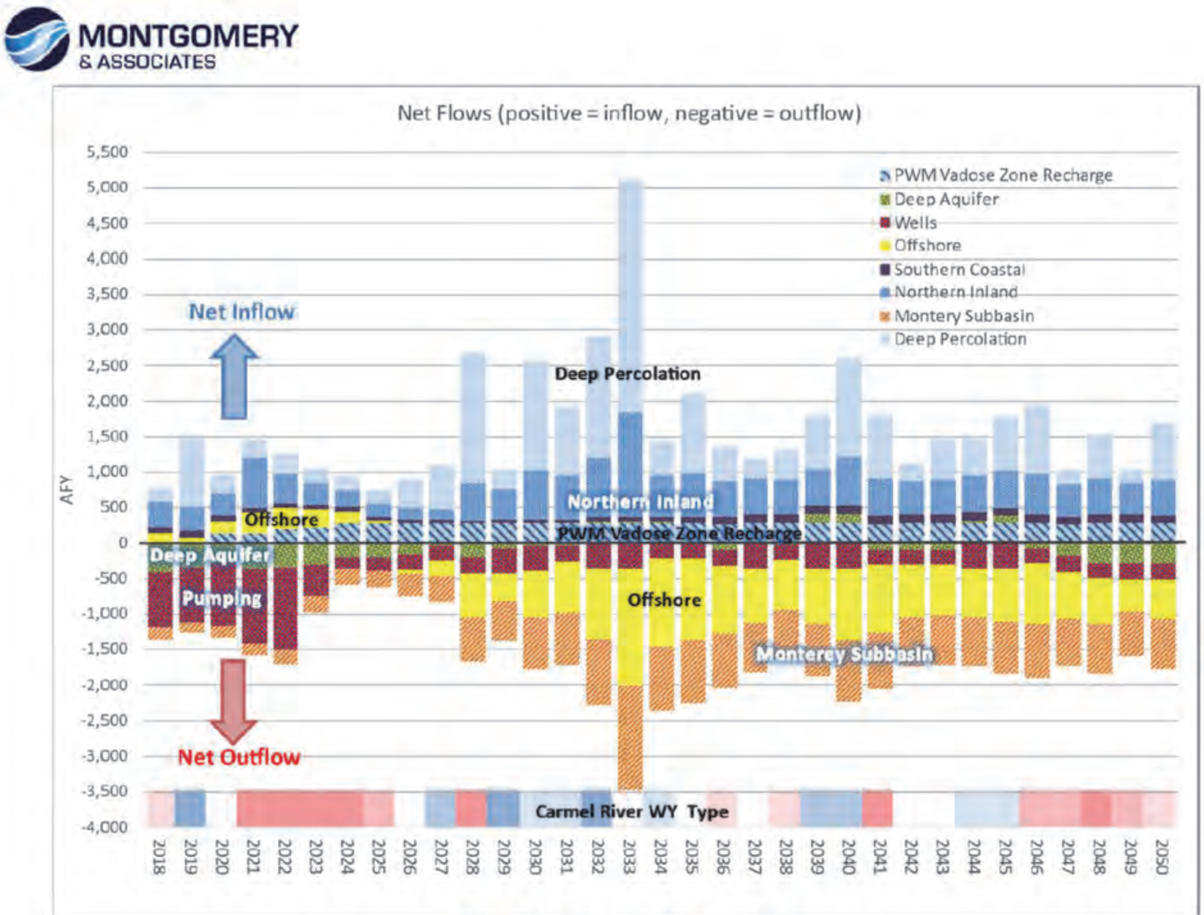

Figure 5. Net Flows to/from the Shallow Aquifers

Net Inflows

Generally, the largest inflows to the Shallow Aquifer are from rainfall dominated deep percolation and inflows from upgradient portions of the Shallow Aquifer in the Northern Inland Subarea, followed by recharge from the PWM vadose zone wells and stormwater percolation ponds, and a very small amount of inflow from the Southern Coastal Subarea. At the beginning of the simulation, when groundwater levels have not substantially risen yet and there is a multiyear period of drought conditions, there is also net inflow from the Offshore region of the aquifer. Later in the simulation, during a few periods when groundwater levels in the Deep Aquifer have risen higher than groundwater levels in Shallow Aquifer, there is also a small amount of upward inflow from the underlying Deep Aquifer.

The magnitude and temporal trend of recharge from deep percolation and inflows from Northern Coastal Subarea is strongly correlated with annual precipitation in the basin, as can be seen in the graph of total simulated annual rainfall on Figure 6. The peaks and troughs in annual rainfall correspond with peaks and troughs of deep percolation and inflow from the Northern Inland Subarea[2], with the peak recharge occurring in WY 2033 which has 38 inches of total rainfall[3], resulting in 3,281 AF of deep percolation and 1,456 AF of inflow from the Northern Coastal Subarea that year. Figure 6 also shows the cumulative rainfall departure curve (CRD), which represents the cumulative sum of rainfall over the simulation period, zeroed to the mean annual rainfall during the simulation period. The trend of the peaks and valley in the CRD curve largely follow the groundwater level trends observed in the hydrographs of the Shallow Aquifer wells.

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[2] Note that the peaks and troughs in annual rainfall for the basin do not always coincide with the Carmel River Water Year type classification color scale at the bottom of the charts which is based on streamflow in the Carmel River rather than on rainfall in the Seaside Basin.

[3] The hydrology of simulated WY 2033 is based on the historical hydrology from WY 1999.

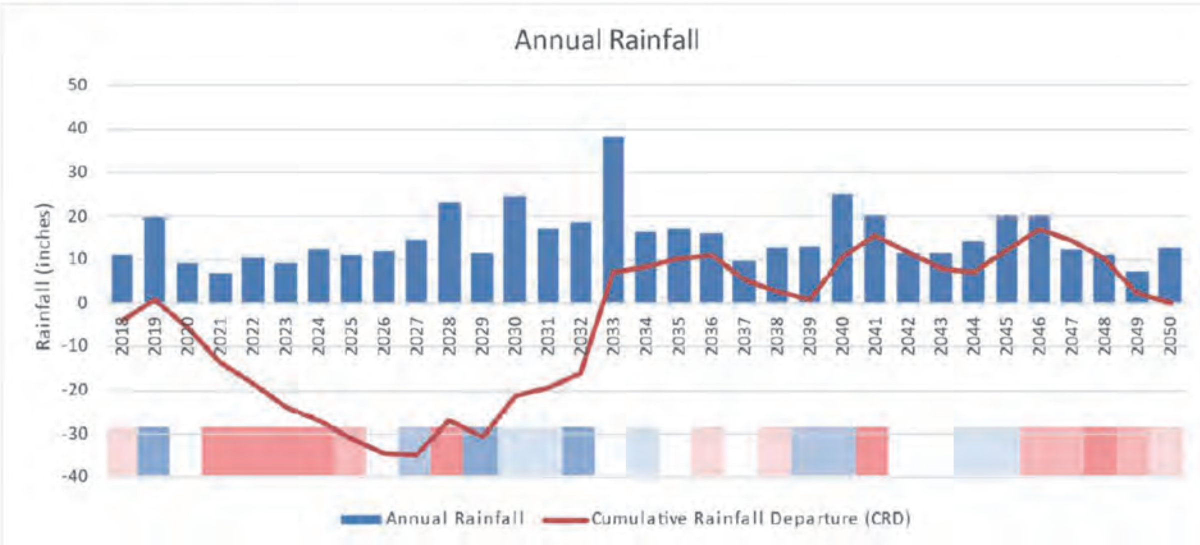


Figure 6. Simulated Annual Rainfall and Cumulative Rainfall Departure

Net Outflows

The first four years of the simulation represents current drought conditions, where pumping for municipal and irrigation use makes up the largest outflow component from the Shallow Aquifer (780-1,200 AFY), followed by leakage to the underlying Deep Aquifer (300-400 AFY), and a smaller amount of outflow to the Monterey Subbasin (~150 AFY). During this period outflows exceed inflows, with exception of WY 2019 which had high rainfall, and groundwater levels remain low. A large reduction in irrigation pumping occurs in 2023 when the City of Seaside is assumed to begin irrigation of their golf courses with recycled water. A further reduction in Shallow Aquifer pumping occurs in WY 2024 as the PWM Expansion project comes online and Cal-Am pumping shifts from smaller capacity production wells screened in the Shallow Aquifer to new higher capacity wells in the Deep Aquifer.

Change in Storage

Groundwater levels can only rise when total inflows exceed total outflows. Conversely, when outflows exceed inflows, groundwater levels will drop. In the parlance of water budgets, when inflows exceed outflows and groundwater levels increase, we refer to this as an increase in storage. When inflows are less than outflows and groundwater levels drop, we call this a reduction in storage. A positive net change in storage occurs when net inflows exceed net outflows and a negative net change in storage occurs when outflows exceed inflows. Figure 7 shows the net change of water in storage (orange columns and left-hand vertical axis) and the cumulative net change in storage (blue line, right-hand vertical axis) in the Shallow Aquifer. These changes in storage (orange columns in plot) can be conceptualized as deposits and withdrawals to/from the storage savings account. The cumulative change in storage (blue line) represents the running total, or account balance, of the net changes of groundwater in storage (relative to the beginning of the simulation). The shape of the cumulative net change in storage curve closely follows the trends of the simulated groundwater levels in the shallow monitoring wells shown on the hydrographs in Figure 2.

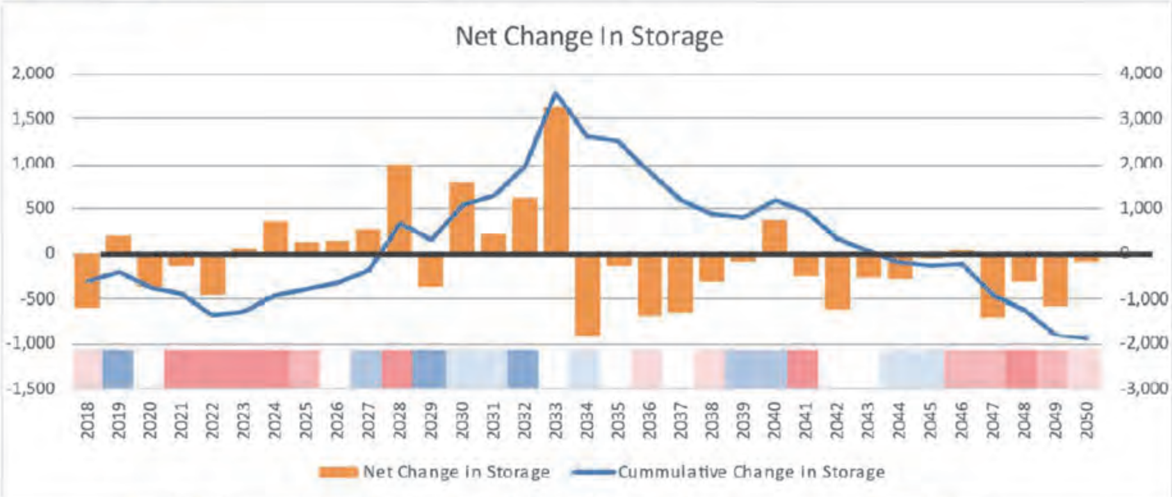


Figure 7. Net Change in Storage (Net Inflow – Net Outflows) and Cumulative Net Change in Storage in Shallow Aquifers

Deep Aquifer Water Budget

Net Flows

Figure 8 shows net flows to and from the Deep Aquifer in the Northern Coastal and PWM Expansion subarea. The flow components include:

- Net pumping (injection or extraction) from wells in the Deep Aquifer, represented as the difference between the total injection of PWM and ASR water and total extraction of native groundwater and recovery of PWM and ASR water. Net pumping is positive and represents a net inflow when total annual injections exceed the total extraction, and is negative (a net outflow) when annual extraction exceeds annual injection
- Flow to/from the Northern Inland Subarea upgradient of the PWM project area
- Flow to/from the Southern Coastal Subarea
- Flow to/from the Offshore regions of the Shallow Aquifer
- Flow to/from the overlying Shallow Aquifer
- Flow to/from the neighboring Monterey Subbasin

For each of the flow components, net flows are calculated as the difference between total inflows and total outflows, such that positive values represent net inflows to the Deep Aquifer and negative values represent net outflows.

The largest net flows to and from the Deep Aquifer are from injection and extraction at wells, respectively. There are also significant "cross-flows" to and from the overlying Shallow Aquifer, the adjacent Southern Coastal Subarea, Northern Inland Subarea, the neighboring Monterey Subbasin, and the Offshore regions of the Deep Aquifer. Positive values represent net inflows to the Northern Coastal Subarea and negative values represent net outflows. After net injection the largest net inflow is from the upgradient Northern Coastal Subarea. After net outflows from extraction, the next largest outflow of water from the Northern Coastal Subarea is from outflows to the neighboring Monterey Subbasin.

The magnitude and direction of these "cross-flows" depends on the relative hydraulic gradients between the Deep Aquifer and the adjacent areas. There is a net flow from the overlying Shallow Aquifer to Deep Aquifer during periods when the groundwater levels in the Deep Aquifer are lower than the groundwater levels in the Shallow Aquifer

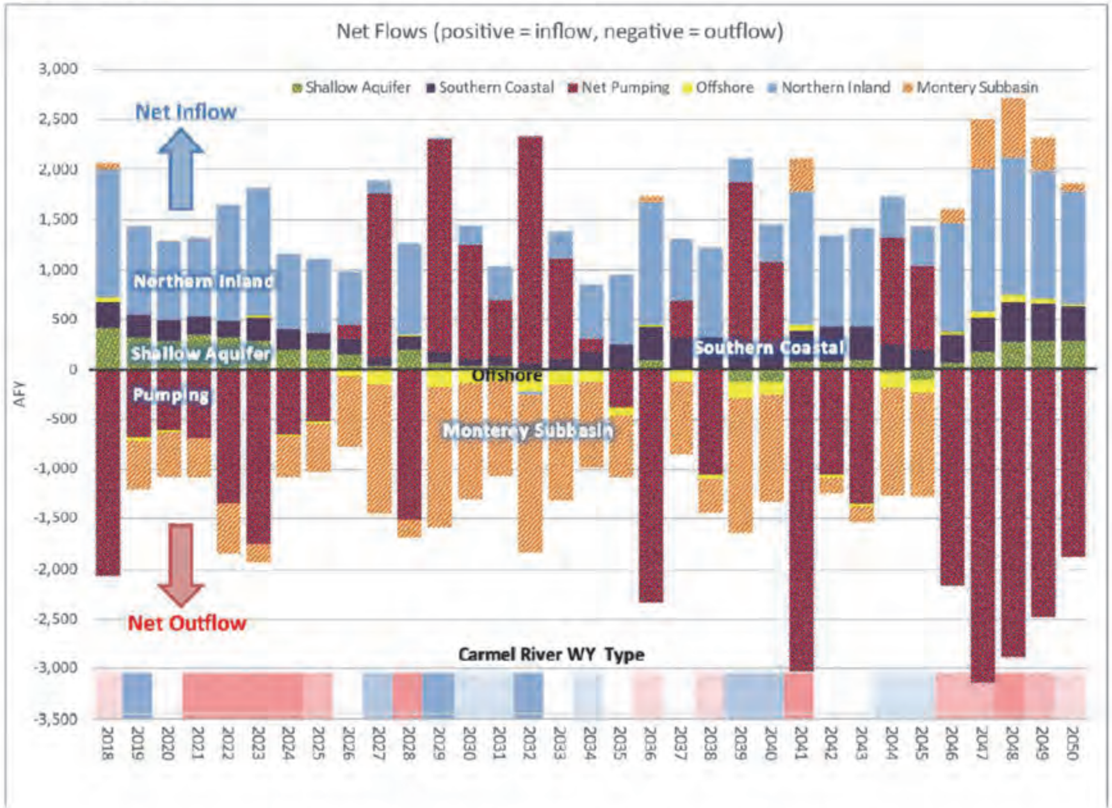


Figure 8 Net Flows to/from the Deep Aquifer (Positive = Inflow, Negative = Outflow)

The simulated head dependent downward flows from the Shallow Aquifer to the Deep Aquifer during periods when groundwater levels are lower in the Deep Aquifer are consistent with the conceptualization that downward flow of saltwater intrusion from Shallow Aquifer poses a potential pathway for saltwater intrusion. The relatively small magnitude of net flows from the Offshore region to and from the Deep Aquifer relative to larger magnitude of net inflow from the overlying Shallow Aquifer are also consistent with the modeled conceptualization that Deep Aquifer is not well connected to the ocean.

Net Pumping

Figure 9 shows only the annual net pumping (injection – extraction) in the Deep Aquifer. Positive values represent years when the total injection of PWM and ASR water to the Deep Aquifer exceeds the total extraction of native groundwater and recovered PWM and ASR water. On an annual basis the net injection and extraction form the largest net volumetric inflows and outflows to the Deep Aquifer.

For example, WY 2032 (classed as Extremely Wet) saw the highest simulated annual net injection of close to 2,300 AF. This net injection volume represented approximately 3,000 AF of ASR injection plus almost 6,000 AF of PWM Expansion injection for total injection of 9,000 AF, with a combined total of City of Seaside and Cal-Am native groundwater extraction and Cal-Am PWM recovery volume of close to 6,700 AF. However, the record high net injection does not correspond to the entire volume of net-injection going into storage to raise groundwater levels. Rather, only about 500 AF went towards the net increase in storage to raise groundwater levels, while 1,800 AF of water flows out of the subarea, with 1,600 AF to the Monterey Subbasin and 200 AF flowing offshore. This means only about 23% of the net inflow contributed to increasing groundwater levels in the Subarea. By contrast, WY 2029 was also an Extremely Wet Carmel River water year with a net injection also close to 2,300 AF, but in this case, a larger volume of 740 AF, went into storage increasing groundwater levels with only 1,600 AF flowing out, representing a higher recharge efficiency of 32%. This difference can be attributed to the fact that in WY 2029, groundwater levels are lower than in WY 2032, and so there was less of a hydraulic gradient driving outflow offshore region and towards the Monterey Subbasin.

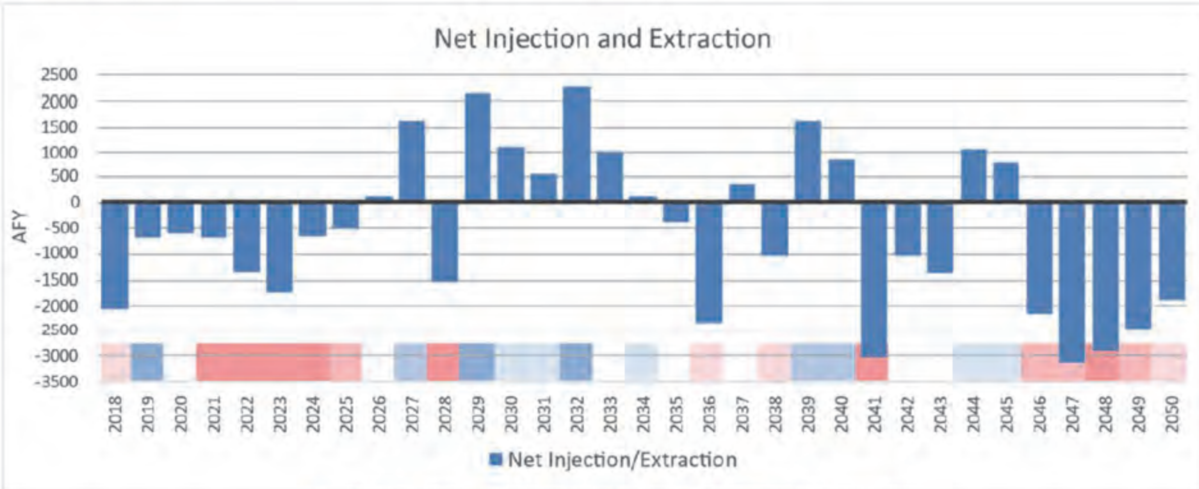


Figure 9. Annual Net Pumping (Positive = Net Injetion, Negative = Net Extraction)

This suggests that there is a spatial and temporal component to maximizing the efficiency of injection for the purpose of achieving protective elevations. As groundwater levels rise, the increased head drives flow out laterally towards areas with lower groundwater levels. In the case of offshore flows, the groundwater level is essentially pinned by sea level, and so outward flows continues as long as inland groundwater levels are greater. In the Monterey Subbasin, however, groundwater levels are not pinned. So as groundwater levels in Monterey Subbasin rise or fall, either in response to the outflows coming from the Seaside Basin or because of water management actions taken in the Monterey Subbasin, the amount of outflow lost from the Seaside Basin will increase or decrease.

Net Change in Storage

Figure 10 shows the net change of water in storage (orange columns and left-hand vertical axis) and the cumulative net change in storage (blue line, right-hand vertical axis) in the Deep Aquifer. Changes in storage (orange columns in plot) can be conceptualized as deposits and withdrawals to/from the Deep Aquifer storage savings account. The cumulative change in storage (blue line) represents the running total, or account balance, of the net changes of water in storage (relative to the beginning of the simulation). The shape of the cumulative net change in storage curve closely tracks the trends of the simulated groundwater levels in deep monitoring wells shown on the hydrographs in Figure 2, showing the same rises and falls.

If the Northern Subarea were a closed system separated from the Monterey Bay, the Monterey Subbasin, and the other Seaside subareas, the change in storage would directly reflect the changes in net injection and extraction. However, because of the connection to these other areas, the actual behavior is more complicated and dynamic, as illustrated by the changing net flows shown on Figure 8.

For example, during the simulated period from 2026 to 2033, which is generally a period of net positive injection into the basin, not all the injected water goes into storage to raise local groundwater levels. Rather as groundwater levels start to rise in response to increased injection, the higher gradient drives increased outflows to the Monterey Subbasin and the offshore regions. And inflows from the neighboring subareas drop, because of reduced gradient relative to the groundwater levels in those area. Similarly, in the simulated extended drought period from 2046 to 2050, when net extraction becomes very large, groundwater levels do not drop as low as they would otherwise have dropped if the basin were closed, because the depressed groundwater levels start to induce increased inflows from upgradient in the Northern Inland Subarea, the Southern Coastal Subarea, Offshore region, and even produce a significant net inflow from the Monterey Subbasin.

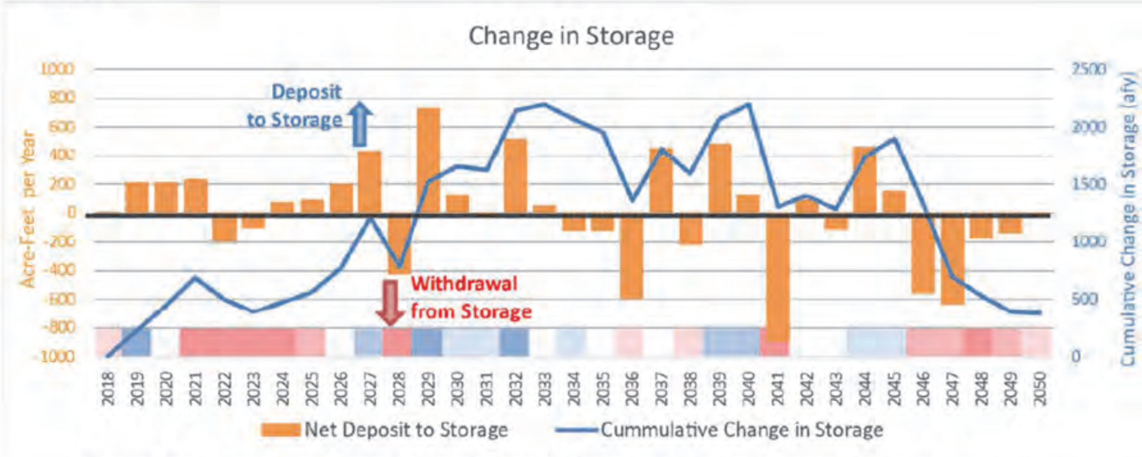


Figure 10. Net Change in Storage (Net Inflow – Net Outflows) and Cumulative Net Change in Storage in Deep Aquifer

Changes in Net Flows from 1,000-AFY Replenishment Scenario –

The same water budget analysis was conducted on the model results from Scenario 2 of the January 2022 replenishment modeling TM (M&A, 2022a), in which 1,000 AFY of replenishment water are injected into the Deep Aquifer starting in WY 2024 when the PWM Expansion Project begins. The purpose of this is to understand how additional replenishment affects crossflows with the Monterey Subbasin, Offshore regions and adjacent Subareas, and the amount of water going into storage to raise groundwater levels, relative to the Baseline simulation. The results, in terms of change in net flows compared to the Baseline scenario, are shown for the Deep Aquifer on Figure 11 and for the Shallow Aquifer on Figure 12.

In the Deep Aquifer (Figure 12), the 1,000 AFY increase in net-injection initially results in a substantial increase of water going into storage (orange columns) raising groundwater levels, but the magnitude of increase subsides as groundwater levels rise, which in turn promotes increased outflows to all the adjacent areas. As the injection mounds grow, the greatest increase in outflows occur to the Monterey Subbasin, Northern Inland Area upgradient of the PWM injection facilities, and upwards into the Shallow Aquifer. The increase in net flow to the Shallow Aquifer occurs more gradually as this requires increasing groundwater levels in the Deep Aquifer above the groundwater levels in the Shallow Aquifer. There is also a smaller but consistent increase in the outflow to the Offshore area, and to the Southern Coastal Subarea.

Figure 12 shows the changes in net flows that occur in the Shallow Aquifer as a result of adding 1,000 AFY of replenishment injection. The most significant change is the steady increase of inflow from the underlying Deep Aquifer. Increased inflow is driven by increasing groundwater levels in the Deep Aquifer relative to groundwater levels in the Shallow Aquifer. A portion of the increased inflow goes to increased net storage, which results in further increased groundwater levels in the Shallow Aquifer. Most of the inflow translates into increased outflows to the Offshore Area, and to a smaller degree by increased outflow to the Monterey Subbasin. The changes to the net flows to/from the upgradient Northern Inland Subarea appear to fluctuate with changes in rainfall.

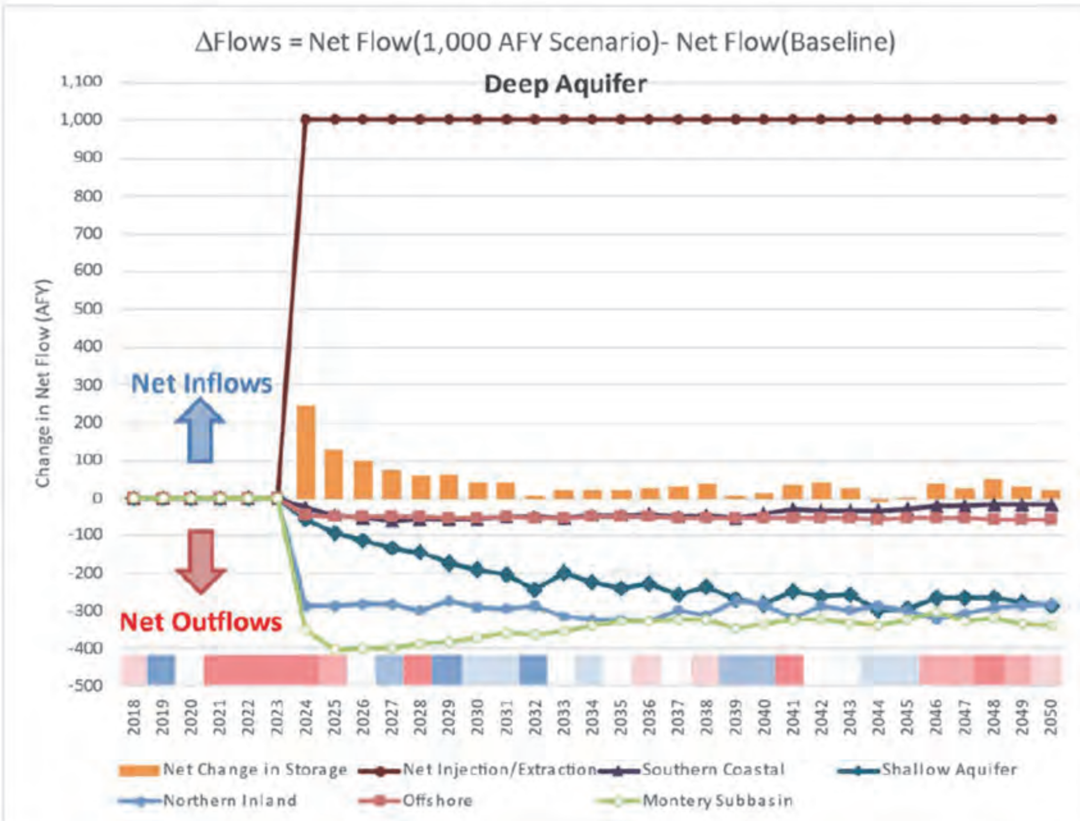


Figure 11. Deep Aquifer: Change in Net Flows between Baseline and 1,000 AFY Replenishment Scenarios

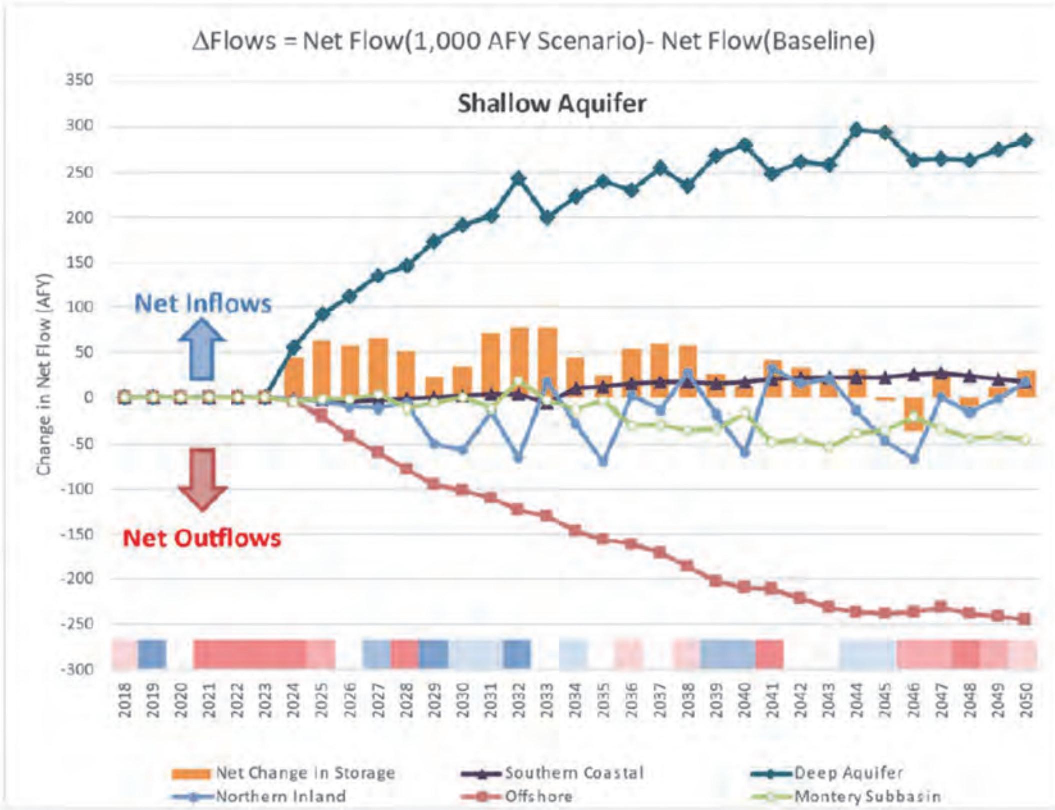


Figure 12. Shallow Aquifer: Change in Net Flows between Baseline and 1,000 AFY Replenishment Scenarios

MONTGOMERY & ASSOCIATES

TASK 2. DEVELOP ALTERNATIVE SCENARIO BASED ON CAL-AM URBAN WATER MANAGEMENT PLAN SUPPLY & DEMAND ASSUMPTIONS AND UPDATED CITY OF SEASIDE ASSUMPTIONS

Members of the Seaside Technical Advisory Committee (TAC) would like to evaluate the impact of an alternate set of future supply and demand assumptions has on the volume of replenishment water needed to increase groundwater levels at the protective elevations coastal monitoring wells. The alternate demand and supply assumptions are based primarily on Cal-Am's 2020 Urban Water Management Plan (UWMP) (WSC, 2020), and additional assumptions provided by Cal-Am and the City of Seaside. The set of assumptions is referred to as Alternative Scenario 1 in this TM.

Updated Assumptions for City of Seaside Golf Course use of Recycled Water & New Well Location

The City of Seaside requested that the following revised assumptions be used:

1. Assume City of Seaside golf courses use 491.4 AFY of recycled water.
2. Assume City pumps an in-lieu amount of 491.4 AFY from the deep aquifer from a new well located at Latitude = 36.615304°, Longitude = 121.826278° (Which is generally in the location of the Lincoln-Cunningham Park in Seaside).
3. Convert 26 AFY of golf course allocation from Alternate Producers (APA) to Standard Producers (SPA). New golf course allocation = 540 – 26 = 514 AFY.
4. The remaining unused balance of 514 – 491.4 = 22.6 AFY would be held as a reserve and/or for flushing of greens and tee boxes.

The current Baseline simulation already incorporates the assumptions that the City of Seaside golf courses switch to using recycled water in WY 2023 and stops pumping from their two Paso Robles (Shallow Aquifer) irrigation wells at that time. However, the Baseline simulation accounted only for 301.1 AFY of the 514 AFY golf course allocation to be re-allocated to supply the planned Campus Town Development project, in addition to the existing City of Seaside municipal pumping allocation currently supplied by pumping of Seaside Muni Well #4. So conservatively if the full 514 AFY of SPA allocation is pumped from the new well, this leaves 514-301.1 = 212 AFY of additional pumping that is not currently included in the Baseline simulation and will need to be accounted for in the hybrid water budget analysis.

MONTGOMERY & ASSOCIATES

Assumptions Requested by Cal-Am

Cal-Am requested that the following assumptions be used:

1. 15 AF per day will be used as the average daily amount of ASR diversion, not the 20 acre-feet per day that was used in the January 2022 modeling. [*In keeping the current cycled Carmel River hydrology record this assumption results in a 25 percent reduction in the projected annual ASR diversion volumes but does not alter the temporal pattern of when ASR injection occurs during the simulation.*]
2. Cal Am's *Urban Water Management Plan* (UWMP) demand figures rather than MPWMD's demand figures will be used for Cal Am's projected water demands.
3. The MPWSP Desalination Plant will begin operation in 2030 in accordance with the UWMP. *[The UWMP assumes the Desal plant will produce 6,252 AFY for the Monterey Peninsula]*.
4. Cal Am's in-lieu repayment of 700 AFY will not begin until its desalination plant begins operation in 2030, in accordance with the UWMP. *[For comparison, the original baseline assumes the repayment period starts in 2024, concurrent with the PWM Expansion project.]*
5. The Pure Water Monterey Expansion Project will begin operation in 2024, as previously simulated in the January 2022 replenishment modeling.
6. To provide a factor of safety, the amount of water that the Pure Water Monterey Expansion Project will deliver will be reduced from 5,700 acre-feet to the *"Minimum Allotment"* of 4,600 acre-feet per year as set forth in the "*Amended and Restated Water Purchase Agreement"* executed between Cal Am, MPWMD, and M1W in late 2021.
7. Cal-Am will make-up any shortfall between supply and demand by over pumping its Seaside Basin allocation of 1,474 AFY. *[If the Desal Plant is built in 2030, even though PWM Expansion is assumed to have reduced deliveries per Cal Am assumption 6 above, there will be no supply shortfall after 2030 because the UWMP indicates that the expected capacity of the Desal plant is sufficient to make up for the reduced PWM Expansion deliveries.]*

These Alternative Scenario 1 assumptions were incorporated into the monthly supply-demand spreadsheet model developed by MPWMD and that is used to assign and distribute simulated monthly Cal-Am pumping and ASR injection in the groundwater model. This supply-demand model incorporates the cycled Carmel River historical hydrology used for the determination of the monthly ASR diversions. Projected ASR injection and Seaside pumping data was then aggregated on a water year basis for comparison and integration with the water budget analysis from the existing Baseline replenishment model run.

Reduced ASR and PWM Injection

Applying the lower 15 AF per day ASR diversion capacity assumption while keeping the existing cycled historical Carmel River hydrology record results in a 25% reduction in the projected annual ASR injection volumes but does not alter the temporal pattern of when ASR injection occurs during the simulation period. Table 2 provides a comparison of the average annual ASR diversion volumes for the original Baseline diversion rate and the reduced Alternate Scenario 1 diversion rate, grouped by Carmel River Water year type when applying the minimum instream flow requirements to determine when ASR diversions can occur in the cycled hydrology record.

Table 2. Average ASR Dibversions by Carmel River Water Year Type for Baseline and Alternative Scenario 1 Diversion Rate Assumptions

Carmel River Water Year Type	Average Number Diversion Days per Year	Average ASR Diversions w/20 AFD Capacity (AFY)	Average ASR Diversions w/15 AFD Capacity (AFY)
Extremely Wet	142	2,840	2,130
Wet	125	2,500	1,875
Above Normal	105	2,100	1,575
Normal	64	1,280	960
Below Normal	33	660	495
Dry	19	380	285
Critically Dry	3	60	45

Figure 14 shows the projected annual ASR injection and PWM injection volumes for the Baseline simulation and the new Alternative Scenario 1. Regardless of water year type, the Alternative Scenario 1 assumptions deliver only 75% of the ASR injection volume of the Baseline volume, and the PWM injection is only 4,600 AF/7,5700 AF = 81% of the Baseline PWM injection volume. Note that in the Alternative Scnenario1 the PWM injection volume still has a dependence on drought conditions in the CSIP Delivery area and so while the average annual delivery is 4,600 AFY, wet years deliver higher volumes and in drought years lower volumes, consistent with how the PWM deliveries are simulated in the Baseline simulation.

Cal-Am Demand and Supply Assumptions

The 2020 Cal-Am UWMP provides historical total annual demand for the Monterey Main system from WY 2006 to WY 2020 and provides five-year projections for 2025 through 2045. To establish a full set of projected annual demand for the entire simulation period, the annual UWMP annual demand values were linearly interpolated from 2020 through 2045, and then extrapolated from 2045 through 2050 using the same slope as between 2035 and 2040. The historical and projected annual total system demands are shown on Figure 13. The Baseline simulation uses historical reported production and ASR + PWM injection data for WY 2018 through 2021, so the use of projected demand is only used in the model for WY 2022 forward.

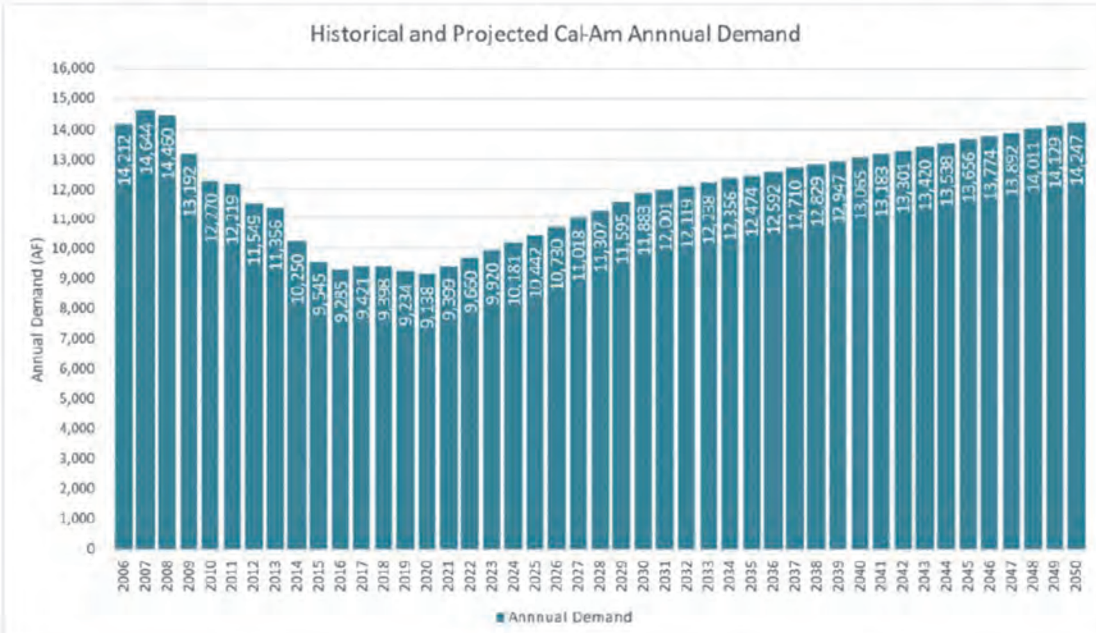


Figure 13. Historical (WY 2006-2020) and Projected (WY 2020-2050) Cal-Am Total System Demand Based on 2020 UWMP Assumption

In the Supply-Demand model, the total annual system demand is distributed to monthly demands by use of historical monthly usage factors. For each month the Supply-Demand model then allocates available water sources to meet the demand. The Baseline model sources water from Carmel Valley Pumping water rights, Sand City Desal, Table 13 Diversions of Carmel River Water, and pumping of native groundwater and injected PWM and ASR water from the Seaside basin. For Alternative Scenario 1 this was extended so that water can also be sourced from the new MPWSP Desalination Plant from WY 2030 onward to meet any excess demand that cannot be supplied by the other sources. Figure 15 shows a side-by-side comparison of the projected total system demand for the Baseline and Alternative Scenario 1, also showing what portion of the demand each year is supplied from each source. In Alternative Scenario 1. From 2030 onward the Desalination Plant plays an increasingly larger role in supplying the increasing annual demand.

Figure 16 shows the projected annual Seaside pumping for the Baseline and Alternative Scenario 1, broken out by water source: native groundwater, PWM recovery, and ASR recovery. For the Baseline scenario, the 25-year Cal-Am in-lieu repayment period is clearly visible in the drop in native groundwater extraction from 2024 through 2048. In the Alternative Scenario 1, the repayment period does not start until 2030 and Cal-Am continues to pump their full 1,474 AFY native groundwater allocation up till that year. Because of the combination of the assumed higher system demand, and assumptions on reduced volume of ASR and PWM injection during this early simulated drought period, there is a supply shortfall from 2023-2029 until the MPWSP Desal Plant comes online. The supply shortfall is met by pumping beyond Cal-Am's 1,474 AFY native groundwater allocation. The simulated multiyear period of normal and wet years starting in 2029 allows for the injection of a considerable amount of ASR which is recovered immediately to supply the increasing system demand and the reduction of native groundwater pumping because of the in-lieu repayment period that starts in 2030. Compared to the Baseline scenario, there is much greater reliance on recovery of ASR water, even in non-drought years, such that there is very little unrecovered ASR. Interestingly, after 2030 when the MPWSP Desal Plant comes online, despite the increased system demand, the average total pumping from the Seaside basin is lower than in the Baseline, because an increasing portion of the higher demand is supplied directly by Desal. This is especially evident during the simulated drought period towards the end of simulation, where a large portion of demand is met by Desal instead of pumping because there is not a built-up bank of ASR water from which to recover water.

Figure 17 shows the annual net injection of PWM and ASR water for both scenarios, defined as the difference between the total annual ASR and PWM injection and the amount of recovered ASR and PWM water in that same year. The figure illustrates how the combination of assumed lower ASR diversion rate, reduced PWM Expansion delivery volume, and increased system demand results in no ASR water being banked in the basin after the end of the simulated multiyear wet period in 2034.

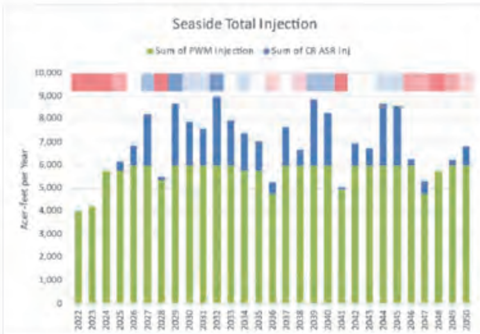
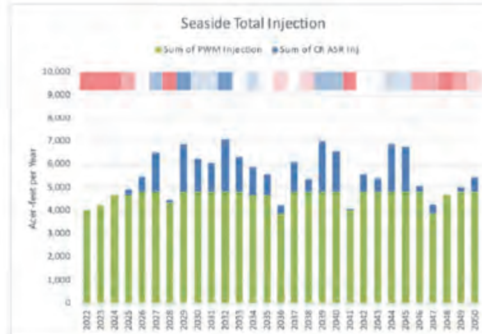
Baseline	Alternative Scenario 1
	

Figure 14. Projected Total Annual Injection of PWM and Carmel River ASR Water for Baseline and Alternative Scenario 1

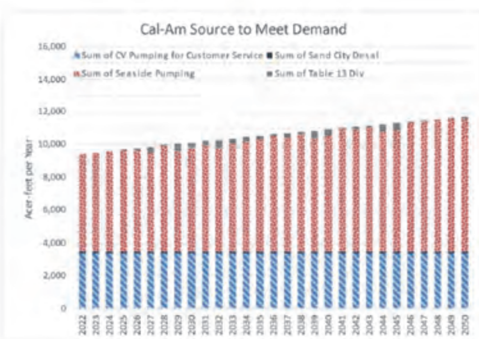
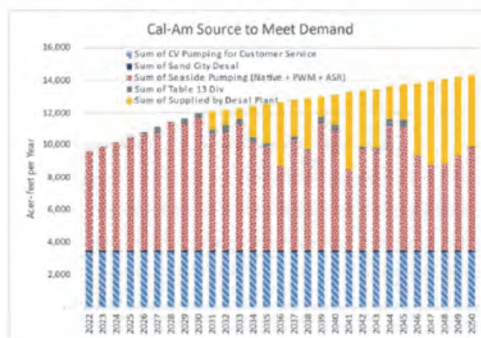
Baseline	Alternative Scenario 1
	

Figure 15. Projected Cal-Am Total Annual System Demand and Water Supply Source for Baseline and Alternative Scenario 1

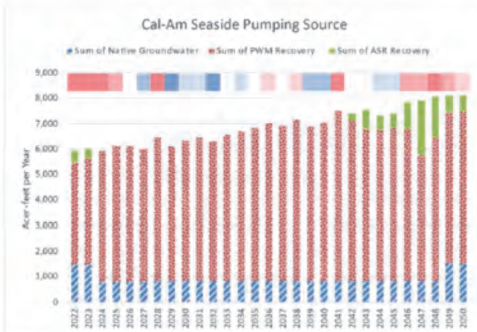
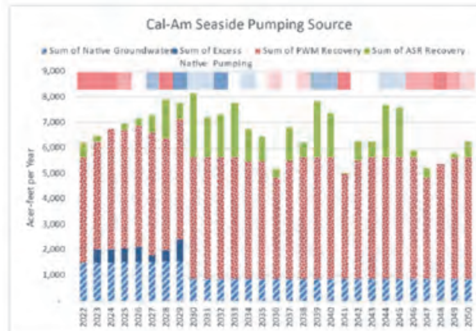
Baseline	Alternative Scenario 1
	

Figure 16. Projected Cal-Am Seaside Pumping by Water Source for Baseline and Alternative Scenario 1

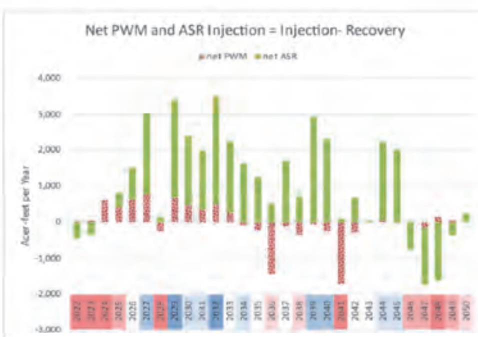
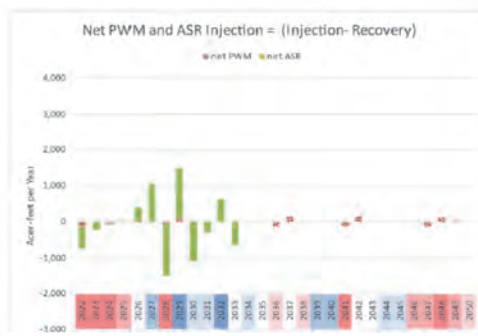
Baseline	Alternative Scenario 1
	

Figure 17. Projected Net PWM and ASR Injection for Baseline and Alternative Scenario 1

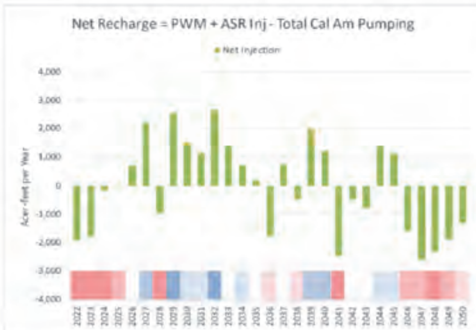
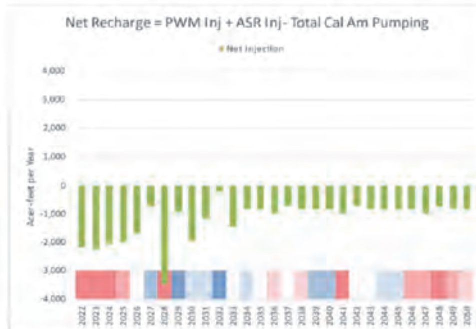
Baseline	Alternative Scenario 1
	

Figure 18 Projected Net Recharge for Baseline and Alternative Scenario 1

TASK 3. HYBRID WATER BUDGET ANALYSIS TO SHOW EFFECTS OF DIFFERENT DEMAND/SUPPLY ASSUMPTIONS ON VOLUME OF REPLENISHMENT NEEDED

Running additional alternative baseline simulations with different supply/demand assumptions in the Alternate Scenario 1 and then determining what volumes of replenishment are needed to meet protective elevations for each alternative scenario is not the only way to evaluate the impacts of differences between the Cal-Am and MPWMD demand/supply assumptions on the estimate of the volume of replenishment water needed.

An alternative to running multiple additional demand/supply scenarios is to use a hybrid water-budget-based approach leveraging information available from the already run Baseline simulation and combine it with Alternative Scenario 1 demand and supply assumptions to estimate the replenishment volume needed to achieve protective elevations. This approach is spreadsheet-based and serves as a framework to develop order of magnitude estimates for the range of needed annual replenishment volumes under the different demand & supply assumptions. The same approach could also be used to incorporate the impacts of potential reductions in future ASR water availability due to climate change. This is achieved without having to setup, re-run, and analyze multiple additional model scenarios

The approach takes advantage of available model scenarios indicating how much net-recharge is needed in the vicinity of the PWM and ASR well fields to raise groundwater levels at coastal monitoring wells to varying degrees. For this purpose, we can define the net recharge as follows:

$$\textit{Net Recharge} = \textit{PWM Injection} + \textit{ASR Injection} + \textit{Replenishment} \\ - \textit{Total Cal-Am \& Seaside Production}$$

For the Baseline simulation and Alternative Scenario 1, the Replenishment term is equal to zero. Additional replenishment scenarios can be included by adding in the replenishment amount. This definition of Net Recharge is also generally equivalent to the Net Pumping term presented earlier in the water budget analysis section.

Based on the findings from the January 2022 modeling, it is apparent that that the rapid initial rise in simulated groundwater levels in the original baseline simulation (see Figure 2) is due primarily to a sequence of wetter years in the simulated cycled hydrology that allows for a prolonged period of significant injection and storage of ASR water. We can conceptualize that if future climate conditions cannot provide this amount of ASR injection shown each year in the January 2022 modeling, or if there is increased system demand that requires that water to be recovered rather than banked, then that "missing" amount of injected water will have to be supplied by an external replenishment source to achieve the same groundwater level increase that has already been simulated in the Baseline.

MONTGOMERY & ASSOCIATES

The differences between the Cal-Am and MPWMD demand/supply assumptions does not change how much net recharge is needed to raise groundwater levels. Rather, they only change the distribution between the three components of Net-Recharge. For example, if there is higher assumed demand, then there will be more pumping, and thus more replenishment water needed to offset the higher pumping while still achieving the same groundwater level rise. Similarly, a lower demand assumption would result in less pumping and would require less replenishment water. So as the demand assumptions are changed, varying amounts of replenishment water will be needed.

As discussed during the April TAC meeting, this analysis assumes that protective elevations are met to the same degree and within the same time frames as in the January 2022 replenishment modeling. If the TAC wishes to explore alternative time frames for reaching protective elevations, then additional groundwater modeling will be required.

One of the factors that allows for this the hybrid analysis approach is the fact that the injection and recovery and extraction wells are generally all located within close proximity to each other within the same aquifer in a well-defined region along the boundary between the Northern Coastal Subarea and the Northern Inland Subarea. Additionally, injection wells are all located upgradient of the recovery and extraction wells. This spatial proximity and configuration allow for use of an annual effective injection rate concept at the subarea scale when considering the evolution of groundwater levels downgradient of the extraction wells. If the extraction wells were located very far from the injection wells, in a different aquifer than the injection well, or all in different portions of the basin, or if the recovery wells were upgradient of the injection wells, then it would be less appropriate to use an effective net injection rate approach for this analysis. This approach is still a simplification with limitations and should be considered as providing a general order-of-magnitude type evaluation rather than as a complete substitute for actual modeling of alternate scenarios.

Figure 18 shows the calculated annual Net Recharge (as defined above) for the Baseline Simulation and Alternative Scenario 1. For the Baseline Simulation, the Net Recharge plot is very similar to the plot of Net Pumping in the Deep Aquifer shown on Figure 9. For Alternative Scenario 1, assumptions on increased demand and reduced supply of PWM and ASR water result in significantly reduced Net Recharge, with Net Recharge being negative for all water years, even during the earlier wet period.

The amount of additional replenishment water needed to be added each year in the Alternative Scenario 1 to have the same Net Recharge as the Baseline Simulation is calculated by the difference in Net Recharge for each scenario:

Additional Replenishment = Net Recharge(Baseline) – Net Recharge(Alternative Scenario 1)

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& ASSOCIATES

Figure 19 shows a graph of additional replenishment needed each year, incorporating the additional 212 AFY of City of Seaside pumping re-allocation from former golf course pumping not previously included in the Baseline. Substantial volumes of additional replenishment water would need to be injected into the Deep Aquifer (between 1,000 and 3,500 AFY) to achieve the same increases in Deep Aquifer groundwater levels as that occur in the first 20 years of the Baseline Simulation.

Surprisingly, in the later part of the simulation, less additional recharge would be needed, and there would even be years with surplus Net Recharge relative to the Baseline Simulation. This appears to result from water from the MPWSP Desal plant supplying the higher demands during the simulated prolonged drought period at the end of the simulation, whereas in the Baseline simulation that water must come from the withdrawal of banked ASR and/or PWM. The surplus would not offset the much larger volumes that would need be added to offset the net deficit from the first part of the simulation period, but it does show how the additional supply of MPWSP Desal water could be used in the future to reduce having to withdraw all the banked water during prolonged drought periods.

Figure 19. Additional Annual Replenishment Needed for Alternative Scenario 1 to Match Baseline Net Recharge

CONCLUSIONS

Water Budget Analysis

An important finding from the water budget analysis of the Baseline Scenario on an aquifer-by-aquifer basis is that Shallow Aquifer recharge from percolation of rainfall and irrigation return flows during periods of higher-than-normal rainfall plays a large role in driving the large steady increases in groundwater levels simulated in the Shallow Aquifer in the first 15 years of the simulation period. The temporal pattern and magnitudes of inflow from deep percolation in the Shallow Aquifer is highly correlated with the temporal pattern of total annual rainfall in the basin. Recharge from percolation in the Shallow Aquifer thus plays a role analogous to that of ASR injection in the Deep Aquifer because the simulated Carmel River hydrology record drives the rapid increase in water levels in the Deep Aquifer during this period.

Net injection of ASR and PWM water to the Deep Aquifer itself does not appear to be a significant driver for simulated increases in groundwater levels in the Shallow Aquifer. Rather the increase appears to be driven by the following.

- The reduction by more than half of pumping from wells screened in the Paso Robles aquifer (Shallow Aquifer), due to the City of Seaside's switch to recycled water for golf course irrigation in WY 2023 and Cal-Am's switch to new higher capacity. Deep Aquifer production wells as part of the PWM Expansion project, in combination with:
    - a multi-year period of normal or higher than normal annual rainfall, and
    - the ongoing recharge of PWM water through the shallow vadose zone wells and backflush percolation ponds.

A net annual volume of between 600 to 1,500 AFY flows out from the Shallow Aquifers to the Monterey Subbasin once water levels in the Shallow Aquifers begin to rise, driven by the increasing relative gradients between the groundwater levels in the Northern Coastal Subarea and the lower groundwater levels in the Monterey Subbasin. A similar magnitude of net outflow occurs to the offshore portions of the Shallow Aquifer.

The water budget analysis of the Deep Aquifer shows a similar magnitude of net outflows to the Monterey Subbasin (600-1,700 AFY) as groundwater levels rise, and surprisingly, even a small amount of net out flow to the overlying Shallow Aquifer as Deep Aquifer during peak periods when Deep Aquifer groundwater levels rise above the levels in the Shallow Aquifer.

The implications of the strong dependence on rainfall for raising the shallow aquifer levels is that it may be advisable to consider and evaluate options for direct recharge of the Shallow Aquifer, rather than relying only on replenishment to the Deep Aquifer via injection wells in the Santa Margarita Formation, in addition to considering other reductions to pumping in the Shallow Aquifer, such as constructing replacement wells only in the Deep Aquifer, and switching other irrigation operations to use recycled water (e.g., Mission Memorial).

The results of the water budget analysis also suggest that there is a spatial and temporal component to maximizing the efficiency of injection for the purpose of achieving protective elevations. As groundwater levels rise, the increased head drives flow out laterally towards areas with lower groundwater levels. In the case of offshore flows, the groundwater level is essentially pinned by sea level, and so outward flows continues as long as inland groundwater levels are greater. In the Monterey Subbasin, however, groundwater levels are not pinned. So as groundwater levels in Monterey Subbasin rise or fall, either in response to the outflows coming from the Seaside Basin or because of water management actions taken in the Monterey Subbasin, the amount of outflow lost from the Seaside Basin will increase or decrease.

Hybrid Water Budget Analysis of Alternative Scenario 1

The hybrid water budget analysis suggests that the large and rapid increases in Deep Aquifer groundwater levels simulated under the Baseline Simulation assumptions would not occur under the supply and demand assumptions of Alternative Scenario 1 without very large quantities of additional replenishment water (~1,000 to 3,500 AFY) injected to the basin in the early period of the simulation.

It is unclear exactly what would happen to groundwater levels in the Shallow Aquifer given the new understanding that the initial rapid increases in Shallow Aquifer groundwater levels observed in the Baseline Simulation are largely driven by percolation of rainfall during wet years, rather than exclusively because of injection to the Deep Aquifer. On the one hand, simulated recharge from rainfall would stay the same, which could result in similar Shallow Aquifer groundwater level increases, but on the other hand, there would likely be net leakage downward to the Deep Aquifer because deep groundwater levels would stay below the Shallow Aquifer levels, potentially offsetting inflows from percolation. This would require additional analysis and or modeling to confirm. The results, however, do emphasize the large role that the assumptions on future climate conditions have on predicting how quickly groundwater levels can be raised, and how much additional replenishment water would be needed. While the hybrid water budget approach could be expanded to consider other climate scenarios, the complex interplay and alternating cross-flows seen through the water budget analysis suggests that there are limits to the type of alternate scenarios that could be evaluated in this way and that this approach is more well suited to evaluating changes in net supply and demand, rather than on climate conditions.

REFERENCES

Montgomery & Associates, Inc., 2022a. Technical Memorandum, Updated Modeling of Seaside Basin Replenishment Options, January.

Montgomery & Associates, Inc., 2022b. Technical Memorandum, Assessment of Potential Sea Water Intrusion Travel Rates, February.

Water Systems Consulting, Inc. (WSC), 2021. California American Water Central Division – Monterey County District, 2020 Urban Water Management Plan, June.

ATTACHMENT 2

Cal Am's response to Public Advocates Office Data Request DG-05

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of California-American Water Company (U210W) to Obtain Approval of the Amended and Restated Water Purchase Agreement for the Pure Water Monterey Groundwater Replenishment Project, Update Supply and Demand Estimates for the Monterey Peninsula Water Supply Project, and Cost Recovery.	Application 21-11-024 (Filed November 29, 2021)

CALIFORNIA-AMERICAN WATER COMPANY'S RESPONSE TO PUBLIC ADVOCATES OFFICE'S DATA REQUEST DG 05

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Dated: August 9, 2022

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Response Provided By:	**Ian C. Crooks**
Title:	**Senior Director of Engineering & Business Development**
Address:	**California American Water** **655 West Broadway, Suite 1410** **San Diego, CA 92101**
CalAdv Request:	**DG-05 Q001**
Date Received:	**July 29, 2022**
Date Response Due:	**August 9, 2022**

DATA REQUEST:

1. Please reference the following data to respond to the questions below regarding Monterey Main System Forecasted Demand:

Ian Crooks' Testimony, Table 5 Excerpt, p. 24:

TABLE 5

Updated Demand Estimates

	BASELINE (2017-2021)[1]	2025	2030	2035	2040	2045	2050[2]
Demographics							
Service Area Population	91,717	93,577	95,437	97,297	99,157	101,017	102,877
Annual Population Growth Rate		0.41%	0.40%	0.39%	0.38%	0.38%	0.37%
Service Area Employment	64,307	67,020	69,732	72,445	75,157	77,870	80,583
Residential Demand							
Residential Demand Indoor/Outdoor	47	48	52.8	52.8	52.8	52.8	52.8
Residential Demand (AF)	4,857	5,031	5,644	5,754	5,864	5,974	6,084
Non-Residential Demand							
Non-Residential Demand (AF)[3]	4,686	4,834	5,019	5,204	5,389	5,574	5,759
Fire Service Demand (AF)[3]	Included as non-revenue water in the non-residential demand category						

1. The average residential and non-residential demand was updated from the UWMP to include data from 2017-2021.
2. Service area population and employment are projected to continue through 2050 as projected through 2045.
3. Residential demand includes both indoor and outdoor water use. Residential water use is expected to increase by 10% when a new water source is available, assumed by 2030.
4. Non-residential demand was updated to inlcude production from all wells, and all non-revenue water including fire service and losses.
5. Tourism and Legal Lots of Record.
6. RHNA 6,213 estimated units multiplied by 0.12AF per unit = 745 AFY, this assumes all RHNA units are multi-family units.

Excerpt from Cal Am A.22-07-001 GRC workpapers, "ALL_CH03_REV_RO_Sales-Customers", tab "Projected Sales WS-04", Cells C31-39, F31-39, G31-39, and AY31-AY39. Note: Column titled "Conversion to (AF)" is calculated and not included in GRC workpapers.

Service Area	REV Class	Revenue Description	2025 Projected Sales/Consumption (CCF)	Conversion to (AF)
Monterey County Main	SRES	Residential	1,847,576	4,241
Monterey County Main	MRES	Multiresidential	459,895	1,056
Monterey County Main	COMM	Commercial	1,112,155	2,553
Monterey County Main	INDR	Industrial	6,125	14
Monterey County Main	OPUA	Public Authority	191,148	439
Monterey County Main	SLFR	Sales for Resale	3,640	8
Monterey County Main	CSTR	Construction	6,788	16
Monterey County Main	RFPS	Residential Fire Protection Service	-	-
Monterey County Main	PFPS	Private Fire Protection Service	-	-
		Total	**3,627,327**	**8,327**

a. Explain the discrepancy between the 2025 total Residential and Multi-residential demand included in Table 5 (5,031 AF) and Cal Am's GRC workpapers, 5,297 AF (4,241 Residential +1,056 Multi-residential).
b. Explain the discrepancy between the 2025 Non-residential demand included in Table 5 (4,834 AF) and Cal Am's GRC workpapers 3,030 AF (2,553+14+439+8+16).
c. Provide the formula used for calculation of 2025 Non-residential demand of 4,834 in Table 5, above, and the source document for each value.

CAL-AM'S RESPONSE

Cal Am incorporates each of its general objections as if stated fully here. Cal Am further objects to the extent this request is vague, ambiguous, argumentative, or unclear, particularly as to terms such as "discrepancy."

The purpose of the demand forecasting in Table 5 of my testimony and the sales forecasting for the GRC differ for several reasons. For the GRC, short-term estimates of actual sales/usage at customers' meters are used for rate design, and not total system production. As California American Water's sales forecasting witness, David Mitchell of consulting firm M.Cubed states, "This report is intended for sales forecasting and ratesetting purposes only. It is not intended for operational planning purposes."[1] For my testimony in this proceeding, demand forecasting is used for long-term water supply planning based on total water production, not sales and rate making in the short-term. As such, the important determination is how much supply is needed for the long-term. For more specifics on methodologies and assumptions related to GRC forecasting, please refer to the Direct Testimony of David Mitchell, Attachment 2 in Application No. 22-07-001.

For my testimony in this proceeding, residential demand was estimated using population and actual and projected water use per person. Existing population was estimated in California American Water's 2020 Urban Water Management Plan ("UWMP") using the population tool developed by the Department of Water Resources. The UWMP then applied a linear growth rate to population determined by the Association for Monterey Bay Area Governments ("AMBAG") population projections. The UWMP applied this growth to a baseline demand that was the 5-year average of 2016-2020 residential demand. For my testimony in this proceeding, the baseline was updated to the average residential use 5-year average from 2017-2021. My testimony also takes into account the recently released Regional Housing Needs Assessment, and AMBAG's assigned allocation of housing needs to each jurisdiction within the county, which allocation was released after the 2020 UWMP was filed.

For the GRC, non-residential sales were determined in the same manner as residential sales. Note that the non-residential sales category does not contain the non-revenue water component that is included in demand projections in Table 5 of my testimony. For my testimony regarding non-residential demand, the demand was estimated using a similar method used in the UWMP, and again, is based on total system production estimates and not sales. The UWMP used employment growth projections from AMBAG to determine a linear growth rate for non-residential demand. Non-residential demand also includes non-revenue water, such as system leaks, flushing, main breaks, and fire service.

The calculation was as follows:
2017-2021 Average Non-residential Demand = 4,686 AF (billing data and production data from company records)

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[1] Direct Testimony of David Mitchell, CPUC A.22-07-001, Attachment 1, page 2.

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Average Employment Annual Growth Rate = 0.78% (UWMP, AMBAG)
2025 Projected Non-residential Demand = 4,686 *(1+0.0078)^4 = 4,834 AF

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Response Provided By:	**Ian C. Crooks**
Title:	**Senior Director of Engineering & Business Development**
Address:	**California American Water** **655 West Broadway, Suite 1410** **San Diego, CA 92101**
CalAdv Request:	**DG-05 Q002**
Date Received:	**July 29, 2022**
Date Response Due:	**August 9, 2022**

DATA REQUEST:

2. Sand City Desalination: Cal Am states (Crooks' Phase 2 testimony, p.40, lines 8-11):

"Under MPWMD Ordinance 132, Sand City has a right to 206 AFY from the Sand City Water Supply Project for use on certain properties located within the City's jurisdiction that are also within California American Water's service area"

a. Are those properties, referenced in the quote above, which are in Sand City and served by Sand City, excluded from Cal Am's forecasted 2025-2050 demand calculation?

CAL-AM'S RESPONSE

Under Ordinance 132, the Sand City entitlement may be used for either new or expanded water uses on Sand City sites, but such sites must purchase a portion of the Sand City entitlement from Sand City for such consideration and upon such conditions as Sand City in its discretion may determine.

California American Water's forecasted 2025-2050 demand calculation is based on overall projected population growth rates and service area employment, and increased future demand due to Pebble Beach entitlements, tourism rebound, legal lots of record, and RHNA demands. Any increased demand in the future that may result from Sand City sites choosing to acquire a portion of the Sand City entitlement for either new water uses or to increase water use at existing sites is not included in the projected demand estimates; nor is the amount of the Sand City entitlement available to Sand City under

MPWMD Ordinance 132 to serve those Sand City sites included in future California American Water supplies.

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Response Provided By:	**Ian C. Crooks**
Title:	**Senior Director of Engineering & Business Development**
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CalAdv Request:	**DG-05 Q003**
Date Received:	**July 29, 2022**
Date Response Due:	**August 9, 2022**

DATA REQUEST:

3. Please respond to the following questions regarding Regional Housing Needs Assessment demand:

Cal Am states (Crooks' Phase 2 testimony, p.20, lines 12-14):
"...demand from future population growth and development of dwelling units as a result of RHNA are additive to the 1,180 AFY of demand associated with Legal Lots of Record."

a. What portion of dwelling units of RHNA will be built on Legal Lots of Record?
b. If the answer to Q.2.a. is "none", explain.
c. On what Legal Lots of Record or other zoning types will the RHNA dwelling units be built?
d. Why did Cal Am decide that all demand resulting from of the development of RHNA dwelling units would be additive to the demand associated with Legal Lots of Record?

Cal Am states (Crooks' Phase 2 testimony, p.15, lines 14-17):

"Balance of County" in table refers to portions of unincorporated Monterey County that are situated within California American Water's Monterey Peninsula Main System, including Carmel Highlands, Carmel Valley, Pebble Beach, and the Del Monte Forest"

e. Since Pebble Beach is included in RHNA, what percentage of Pebble Beach Entitlements demand is RHNA housing?
f. Explain why Cal Am includes a separate line item in Table 5 of Ian Crooks' testimony (p.24) for Pebble Beach Entitlements.

CAL-AM'S RESPONSE

California American Water incorporates its general objections as if each is asserted here. California American Water further objects to the extent this request calls for speculation. Where appropriate California American endeavors to provide estimates, forecasts, projections, or other information. Subject to these objections, California American Water responds:

California American Water assumes that none of the 6,213 housing units estimated in California American Water's Monterey Main System and identified in the testimony would be built on Legal Lots of Record.

California American Water assumes that no RHNA dwelling units will be built on Legal Lots of Record because the potential overlap between RHNA dwelling units and Legal Lots of Record is expected to be minimal when compared to the overall demand for Legal Lots of Record, and it is uncertain there will be any overlap at all.
For purposes of the demand projections, California American Water assumes the RHNA dwelling units will all be multi-family units. However, the zoning types for the RHNA dwelling units will depend on the jurisdiction in which the units are built. Each city and the unincorporated county have their own zoning regime and development plans, as such, each RHNA housing development may have a different zoning type based on where it is located. However, for demand forecasting, California American Water conservatively estimated all RHNA units will be multi-family dwelling units and used a demand of 0.12 AFY/unit to calculate a total RHNA demand attributed to RHNA demand of 745 AFY.

California American Water assumed that RHNA demand would be additive to the demand associated with Legal Lots of Record because California American Water assumes that all RHNA housing units will be multi-family units and there is only a potential overlap of between 35 AF and 137 AF over the twenty-five-year demand forecast period included in the testimony, see Table 5 demand for Legal Lots of Record Residential (Multi).

Additionally, Legal Lots of Record demand is built-out over a twenty-five-year period (2025 to 2050), whereas the RHNA allocation must be met by 2031. California American Water determined that it is reasonable to include an estimate of only 745 AFY for the RHNA demand through 2050, disregarding any RHNA housing demands that might be imposed beyond 2031. This is a conservative assumption for future demand for housing based on RHNA allocations within California American Water's Monterey Main service area, because additional RHNA demand will continue beyond 2031 and California American Water is not speculating what RHNA housing demands might be imposed beyond 2031.

None of the Pebble Beach Entitlements demand was assumed to be RHNA housing. Even though Pebble Beach is included in RHNA, the demand for Pebble Beach Entitlements is treated differently than the demand for the remainder of the county, including the RHNA housing demand, because the Pebble Beach Entitlements are specific water entitlements that MPWMD granted to the Pebble Beach Company to serve *existing* Del Monte Forest properties when they are developed in the future.[2] The Pebble Beach Entitlements constitute an existing commitment by MPWMD and obligation to serve by California American Water when the Del Monte Forest properties are developed. Because the Pebble Beach Company currently owns the entitlements and can sell them to existing Del Monte Forest property owners, and because the RHNA demand is allocated to new, affordable housing, the two demands appear separate.

The only way the two demands would be expected to overlap would be if an existing Del Monte Forest property owner builds new, affordable housing and uses Pebble Beach Entitlement water to supply the housing. However, the majority of California American Water's service area in the unincorporated County is outside of Pebble Beach. It is reasonable for California American Water to assume the vast majority of units included in the "Balance of the County" would be in areas in the unincorporated County other than Pebble Beach.

California American Water includes a separate line item in Table 5 of Ian Crooks' testimony for Pebble Beach Entitlements because, as stated above, the Pebble Beach Entitlements represent an existing obligation by Cal Am to serve existing Del Monte Forest properties once they are developed. This demand is not captured by any of the other line items in Table 5, so it must have its own line item to properly project total future demand for California American Water's service area. The CPUC approved this approach in D.18-09-017 and California American Water has consistently used this approach in the past when projecting future demand, including in its 2020 Final UWMP.[3]

[2] MPWSP FEIR/EIS, p. 2-12.

[3] D.18-09-17, p. 50; MPWSP FEIR/EIS, p. 2-12; California American Water Final 2020 UWMP (June 2021), pp. 4-6.

California-American Water Company

APPLICATION NO. A.21-11-024
DATA REQUEST RESPONSE

Response Provided By:	**Ian C. Crooks**
Title:	**Senior Director of Engineering & Business Development**
Address:	**California American Water** **655 West Broadway, Suite 1410** **San Diego, CA 92101**
CalAdv Request:	**DG-05 Q004**
Date Received:	**July 29, 2022**
Date Response Due:	**August 9, 2022**

DATA REQUEST:

4. Please respond to the following questions regarding Tourism Bounce-Back:

   a. Provide 2012-2021 average annual demand due to tourism within the Monterey Main System area. Note: tourism is described in Ian Crooks' Phase 2 testimony, p. 21, lines 18-19.
   b. Provide the 2012-2021 average annual hospitality industry "occupancy and visitation rates"[4] for the Monterey Main System. Note: occupancy and visitation rates are described in Ian Crooks', Phase 2 testimony, p.21, lines 20- 21.
   c. Explain how the tourism annual demand for the Monterey Main System is calculated.

CAL-AM'S RESPONSE

The demand identified for tourism bounce-back is based on the determination made by the California Public Utilities Commission ("CPUC") in Decision D.18-09-017 and the Monterey Peninsula Water Supply Project FEIR EIS. The CPUC reviewed evidence provided by multiple parties, including analysis by the Coalition of Peninsula Businesses, and found that a tourism industry recovery projection of 500 afy is a reasonable figure to represent additional demand, and is reasonable under the California Waterworks standards.

[4] A.21-11-024 Phase 2 Cal Am Application Testimony of Ian Crooks', p. 21, lines 20-21.

ATTACHMENT 3

QUALIFICATIONS OF WITNESS

STATEMENT OF QUALIFICATIONS – DAPHNE GOLDBERG

Q1. Please state your name, business address, and position with the California Public Utilities Commission ("Commission").

A1. My name is Daphne Goldberg, and my business address is 505 Van Ness Avenue, San Francisco, California 94102. I am a Utilities Engineer in the Water Branch of the Public Advocates Office.

Q2. Please summarize your education background and professional experience.

A2. I received a Bachelor of Science Degree in Civil Engineering from Santa Clara University, a Master of Business Administration Degree from San Francisco State University, and a Master's in Civil/Environmental Engineering from University of California, Davis. I received my Engineer-in-Training Certification in the State of California, Certificate #141820.

My professional experience in my role as a Utilities Engineer includes work on several General Rate Cases, water system acquisitions, and the review of Advice Letters. Prior to joining the Public Advocates Office, my professional experience includes work as a Staff Engineer at URS Corporation in the Civil Engineering Group where I assisted the civil engineers and planners in infrastructure design projects, development of project schedules and budgets and preparation of new project proposals; and a position as a Design Trainee at the San Francisco Public Utilities Commission where I worked on the Water System Improvement Program in the Project Management Bureau on performance reporting documents related to water resources planning, scheduling, risk management and operations.

Q3. What is your responsibility in this proceeding?

A3. I am responsible for the preparation of the Report and Recommendations on Cal Am's A.21-11-024.

Q4. Does this conclude your prepared direct testimony?

A4. Yes, it does.