D-R-A-F-T
MINUTES

Seaside Groundwater Basin Watermaster
Technical Advisory Committee Meeting
January 12, 2022
(Meeting Held Using Zoom Conferencing)

Attendees: TAC Members

City of Seaside – Scott Ottmar
California American Water – Tim O'Halloran
City of Monterey – Cody Hennings
Laguna Seca Property Owners – Wes Leith
MPWMD – Jon Lear
MCWRA – Tamara Voss
City of Del Rey Oaks – No Representative
City of Sand City – Leon Gomez
Coastal Subarea Landowners – No Representative

Watermaster
Technical Program Manager – Robert Jaques
Administrative Officer – Laura Paxton

Consultants
Montgomery & Associates – Pascual Benito, Abby Ostovar
EKI – Tina Wang, Vera Nelson

Others
SVBGSA – Emily Gardner
MCWDGSA – Patrick Breen
MoCo Supervisor Mary Adams Office – Sarah Hardgrave
Nolan Fargo

The meeting was convened at 1:31 p.m.

1. Public Comments
There were no public comments.

2. Administrative Matters:

A. Approve Minutes from the November 17, 2021 and December 15, 2021 Meetings
On a motion by Ms. Voss, seconded by Mr. Leith, the minutes were unanimously approved as presented.

B. Sustainable Groundwater Management Act (SGMA) Update
Mr. Jaques summarized the agenda packet materials for this item and there was no other discussion.

C. Make Findings Required Under AB 361 Regarding Holding Meetings Via Teleconference
After a brief introduction by Mr. Jaques, a motion was made by Mr. Lear, seconded by Mr. Gomez, to adopt the findings contained in the agenda packet. The motion passed with all members voting in favor except for Mr. Leith who voted no.

3. Status Report on Flow Direction and Flow Velocity Modeling
Mr. Jaques summarized the agenda packet materials for this item.

Mr. Benito gave a brief update explaining that the updated baseline model from the replenishment water modeling work will be used in the flow direction/flow velocity modeling work.

4. Presentation and Discussion of Replenishment Water Modeling

Mr. Jaques introduced this agenda item and Mr. Benito provided a PowerPoint presentation to describe the work. Attached are copies of the PowerPoint slides that he used in his presentation.

Mr. O'Halloran noted that Cal Am had used a different sea level rise projection of 3.5 feet in the design of the Monterey Peninsula Water Supply Project. Mr. Benito reported that that sea level rise was intended for use in the design of critical infrastructure. He said he investigated this, and found that the projected mean sea level rise does not reach that high a level within the modeling timeframe for the replenishment modeling work.

Mr. Leith asked a question regarding the amounts of diversion from the Carmel River. Mr. Benito responded that the 2013 model used 1,400 acre-feet per year, but the average amount is lower in the updated hydrologic modeling.

Mr. O'Halloran commented that climate change impacts the amounts of water that can be diverted from the Carmel River. Mr. Benito said he concurred, and Mr. Lear added to Mr. Benito's response.

Mr. Benito said that the Pure Water Monterey Project is seeking permit approval to increase the amount of water that can be injected under that project to 4,100 acre-feet per year.

Mr. Leith raised a question about the extraction of native versus Pure Water Monterey injected water. Mr. Benito responded that even though the basin is "credited" with the amounts of water injected by the Pure Water Monterey Project, the water that is actually extracted is not necessarily all Pure Water Monterey injected water, some of it is native groundwater.

Mr. Benito went on to say that he had created a fourth scenario, in addition to the three scenarios described in the Technical Memorandum, to examine the effect of doing some replenishment to the Paso Robles aquifer, and shifting some of the pumping to the Santa Margarita aquifer from the Paso Robles aquifer. Mr. Jaques commented that this scenario is not described in the text, and Mr. Benito responded that he would add a discussion of it to the text in the final version of the Technical Memorandum. He noted that in the three other scenarios all of the replenishment water is injected into the Santa Margarita aquifer.

Mr. Benito also pointed out that the protective water elevations increase slightly due to sea level rise, which is taken into account in the modeling work.

Mr. Benito went on to say that periodic drought conditions have a big impact on the availability of replenishment water to achieve and maintain protective water levels. Drought conditions reduce the amount of replenishment water that is available in any given year.

Mr. Ottmar asked what the historical water quality is at well MSC-shallow. Mr. Lear said that the well is not currently showing any signs of sea water intrusion. He went on to say that the well has never had groundwater levels at protective water levels, and he felt that how protective water levels are determined should be reevaluated for the shallow wells.

In response to a question from Mr. Ottmar, Mr. Benito explained that as groundwater levels within the Basin rise due to replenishment, more water flows out of the Seaside Groundwater Basin to the Monterey Subbasin in the Marina-Ord area, and also to the ocean.

In performing the modeling, it was assumed that Cal Am would extract ASR water as its last source of supply, after exhausting available water from the Pure Water Monterey Project and native groundwater. Consequently, the ASR water tends to have the long-term effect of raising water levels in the Basin because much of the injected ASR water is left in the Basin.

Mr. Jaques asked whether the Watermaster should be concerned about groundwater levels at well MSC-shallow, since there do not appear to be any production wells in that part of the Basin. Mr. Lear reiterated his earlier comment that it would be a good topic for discussion at a future TAC meeting to revisit the method of determining protective water levels, and also to inform some of the newer TAC members about what protective water levels are and how they are determined.

Mr. Lear asked if the Pure Water Monterey's CSIP drought reserve was not included in the simulation, what would be the effect. Mr. Benito said it probably wouldn't have a significant impact, but it would result in slightly lower groundwater levels than those resulting from the modeling, which includes the drought reserve.

In response to a question, Mr. Lear explained that Table 13 water is a river-flowrate-dependent water right that Cal Am can use in its Carmel River well fields. It is in addition to the 3,376 acre-feet per year water right which Cal Am has to divert water from the Carmel Valley basin.

A motion was made by Mr. O'Halloran, seconded by Ms. Voss, to approve the Technical Memorandum with edits to reflect today's discussion and input, and to forward it to the Board for its consideration. The motion passed unanimously.

5. Discuss Performing Additional Replenishment Water Modeling Using Different Assumptions
Mr. Jaques summarized the agenda packet materials for this item.

Mr. Ottmar reviewed the two items on page 57 of the agenda packet that he had commented on.

1. He said he felt that the updated model adequately addresses Seaside's concerns about Item 1 on page 57. Mr. O'Halloran questioned whether the timing was realistic with regard to using recycled water at the Seaside golf courses to stop groundwater pumping there. Mr. Ottmar said he felt it was realistic to expect that the golf courses will begin using recycled water in 2023.
2. Mr. Ottmar reported that a new well will need to be installed to supplement Municipal Well No. 4 in order to supply future developments. The City will be looking for the best location to construct a new well.

   Mr. Ottmar went on to say that the City will probably use the full amount of its golf course allocation of 540 acre-feet per year to help supply the new developments. Mr. Ottmar and Mr. Breen reported that the amount of recycled water planned for the Seaside golf courses under the Regional Urban Water Augmentation Project (RUWAP) is 453 acre-feet per year, not the full 540 acre-feet per year allocation contained in the Adjudication Decision. This would leave about 90 acre-feet per year of Seaside groundwater allocation not accounted for. Mr. Benito said the model currently assumes that this 90 acre-feet is not used. There was brief discussion about whether it is worth performing another model run reflecting using the full 150 acre-feet per year difference between the Campus Town's 301 acre foot per year of projected demand, and the 453 acre-feet per year of recycled water planned to be provided by the RUWAP project. Mr. Jaques said he would talk with Mr. Benito to get an idea of what costs would be associated with performing another model run with that taken into account.

Mr. O'Halloran reviewed the seven items on page 57 of the agenda packet that he had commented on.

1. Mr. O'Halloran recommended using 13 acre-feet per day for the ASR diversions, not the 20 acre-feet per day that was used in the modeling. He felt that 13 acre-feet per day was a more realistic estimate.

2. He felt that the Pure Water Monterey Expansion Project should not be expected to reliably deliver 5,700 acre-feet per year, and that a lower volume than that should be used to provide a factor of safety. Mr. Lear said the latest Water Purchase Agreement contains water supply guarantees from M1W, and that those guarantee quantities could be used to establish "floors" since M1W would be committed to meeting those guarantees.
3. Mr. O'Halloran commented that Cal Am was under no legal requirement to start the 700 acre-foot per year reduction at a specific time. There was discussion of this topic but no clear direction.
4. Mr. O'Halloran said that no revisions to the modeling work needed to be performed to address Item 4.
5. Mr. Benito reported that the model currently has some producers pumping less than their full Decision allocations, and that it uses an average of actual pumping in the most recent five years. Mr. O'Halloran felt it was okay to use the model's assumption of actual pumping in the most recent five years.
6. Mr. O'Halloran recommended using Cal Am's Urban Water Management Plan demand figures rather than MPWMD's demand figures. This would increase projected demands over what the model has currently in it. Mr. Benito noted that in many other basins, their Groundwater Sustainability Plans use Urban Water Management Plans as their demand assumptions.

   Mr. Lear commented that the Pure Water Monterey Expansion's SEIR used the MPWMD demand projections. Mr. O'Halloran commented that Cal Am's Urban Water Management Plan demands were used in the approved CEQA document for the Monterey Peninsula Water Supply Project.
7. Mr. O'Halloran felt that Mr. Benito had adequately explained the sea level rise approach that had been used in the modeling, and that no changes were needed to address this Item.

Mr. Ottmar asked if model runs should be made of various "what if" scenarios to get an idea of the range of replenishment needs for those differing assumed conditions.

Ms. Voss questioned whether revising the assumptions to be more conservative and coming up with greater replenishment water needs would provide helpful information for the Watermaster Board.

Mr. Lear commented that another scenario could be one that evaluates the effect on the Seaside Basin if the Groundwater Sustainability Plan's projects and management actions in the Monterey Subbasin are implemented. Mr. Benito said a new model scenario could be run using the groundwater levels projected in those GSPs to see the effect on the Seaside Subbasin. The model currently assumes that no GSP implementation projects are implemented.

There was consensus to accept Mr. Jaques' proposal that he discuss with Mr. Benito, Mr. O'Halloran, and Mr. Ottmar these various issues and to come back to the TAC with more refined descriptions of potential additional scenario(s) to be modeled, and what the cost to run the additional scenario(s) would be.

6. Discuss and Provide Direction on Concerns About the Final Draft Groundwater Sustainability Plan for the Monterey Subbasin

Mr. Jaques summarized the agenda packet materials for this item. He reported that his concerns were principally in the following four areas:

1. Modeling differences between the Watermaster's Seaside Basin groundwater model and the one being used for preparation of the Monterey Subbasin GSP.
2. Concerns about the impacts on the Laguna Seca Subarea from pumping within the Corral de Tierra Subarea.
3. Unrealistic expectations for GSP projects and management actions to bring groundwater levels back up in the Monterey Subbasin.
4. Over-subscribing the amount of recycled water that will be available for projects to reduce pumping of groundwater.

Mr. Lear said that his main point of concern is water flowing out of the Laguna Seca Subarea into the Corral De Tierra Subbasin and the falling groundwater levels in the eastern part of the Laguna Seca Subarea.

Ms. Voss said she agreed with these concerns, and that the Laguna Seca Subarea is of special concern. She concurred that a better explanation is needed in the GSP about the reality of getting Monterey Subbasin groundwater levels up within the 20-year GSP implementation timeframe.

Mr. Hennings said he concurred with the concerns about inter-basin groundwater flows.

Mr. O'Halloran said he concurred with Mr. Jaques' and the others' comments about these concerns. In particular, the likelihood of projects being implemented as rapidly as the GSP projects.

Mr. Ottmar said it was important to ensure that the models coordinate together and was also concerned about over-subscribing recycled water.

Mr. Leith encouraged working collaboratively as much as possible so all are on "the same page".

Mr. Lear noted that the GSP's are to be updated during the implementation timeframe.

Ms. Wang commented that Patrick Breen had to leave for another meeting, and that she would present his comments. The MCWDGSA will investigate other water sources in addition to recycled water. They will measure groundwater levels and report on them as the GSP implementation progresses, and will update the groundwater levels as time goes on. They will continue working with the Watermaster and will be adding monitoring wells for detection of sea water intrusion. Also, they will work to refine the cross-boundary flow projections.

Ms. Nelson said that during the implementation period, the interim milestones will be evaluated by the Department of Water Resources (DWR) to see if the Groundwater Sustainability Agencies are fulfilling their GSP milestones.

Ms. Ostovar said that she has tried to address the Watermaster's comments in the GSP and will continue working with the Watermaster on the issues of concern.

Mr. Jaques recommended waiting to see the language in the Final GSP that is submitted to DWR, and to then resume discussion of this topic to see if any action should be recommended to the Watermaster Board. There was consensus to take this approach and to not take any further action at this time.

7. Schedule

Mr. Jaques noted that the only change in the schedule in this update was the timing of the presentations on the flow velocity/flow direction modeling work. There was no other discussion.

8. Other Business

There was no other business.

The meeting adjourned at 4:35 PM.

SEASIDE GROUNDWATER BASIN

2021 UPDATED REPLENISHMENT MODELING

MONTGOMERY & ASSOCIATES

Presented to the Seaside Basin TAC January 12, 2022

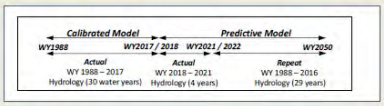
PROJECT PURPOSES

- Develop updated "do-nothing" baseline predictive simulation that incorporates:
  - an extended hydrology period (1987-2017),
  - sea level rise,
  - all new and proposed projects, including PWM Expansion & Cal-Am 700 AFY repayment, and
- Assess how much replenishment it will take to achieve protective groundwater elevations within 20 years

MONTGOMERY & ASSOCIATES 2

UPDATED BASELINE SIMULATION

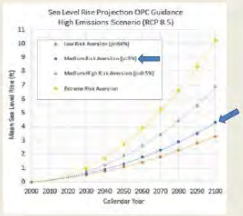
- Simulates period from WY2018-2050
- WY2018-2021: measured pumping, injection & hydrology
- WY2022-2050: projected pumping, injection, & cycled hydrology



MONTGOMERY & ASSOCIATES 3

INCORPORATING SEA LEVEL RISE

- Mean Sea Level Rise (MSLR) of 1.3 ft by 2050
- Sea level rise incorporated by adjusting MSL used for ocean boundary in model
- Protective elevations adjusted for MSLR by increasing elevations by the projected MSLR amount over time



MONTGOMERY & ASSOCIATES

PROJECTED PUMPING

- Standard & Alternative Producers
  - WY2018-2021 – Actual Values
  - WY2022-2050 5-year average of WY2017-2021 pumping
- Cal-Am stops pumping in Laguna Seca subarea in WY2021 (though continues pumping in Hidden Hills Unit just outside basin at 5-year average of reported rates)
- Cal-Am's projected demand & pumping based on updated version of MPWMD supply-demand forecast model
- Golf course irrigation pumping matches historical pumping aligned with repeated historical hydrology
- All projected SPA & APA pumping within safe yield allocations, except for Seaside Municipal
- Pumping in adjacent subbasins remains at average of recent reported or estimated levels, with no assumption that any projects in their respective GSP's are implemented

EXISTING & PLANNED PROJECTS

- Carmel River ASR and Cal-Am Table 13 diversions operate same as currently but based on cycled historical Carmel River hydrology
- Pure Water Monterey (PWM) base injection averages 3,500 AFY beginning in WY2020 with PWM Expansion project increasing to an annual average of 5,750 AFY assumed to start in WY2024.
- Cal-Am's 700 AFY reduction in pumping of native groundwater as part of its 25-year groundwater over-pumping repayment starts in WY2024

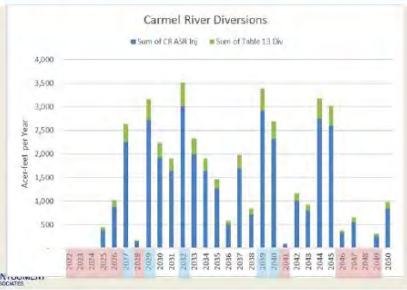
MONTGOMERY & ASSOCIATES

EXISTING & PLANNED PROJECTS

- SNG development completed WY2025 and supplied up to a max of 70 AFY water from Cal-Am wells
- In WY2023 City of Seaside replaces its golf course irrigation with PWM recycled water and uses its 540 AFY golf course irrigation allocation to supply the Campus Town development with up to max of 301 AFY

MONTGOMERY & ASSOCIATES

PROJECTED CARMEL RIVER DIVERSIONS



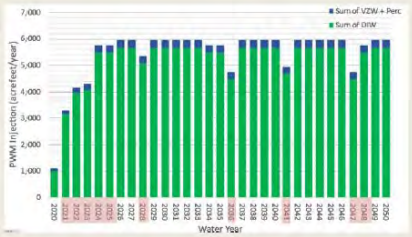
MONTGOMERY & ASSOCIATES

PWM RECHARGE ASSUMPTIONS

- WY2020-2023 Base Project ramps up from 3,500 AFY to 4,100 AFY
  - 95% to Santa Margarita, 5% to Paso Robles
- PWM Expansion Project Begins in WY2024
  - Annual average of 5,750 AFY Injection
  - 98.5% to Santa Margarita, 1.5% to Paso Robles
  - 1,000 AF Drought Reserve
    - 200 AFY additional injection during up to 5 consecutive non-drought years
    - Reduced injection during drought years to supply CSIP with recycled water for irrigation in Salinas Valley
    - Cal-Am recovers "banked" water during drought years

MONTGOMERY & ASSOCIATES

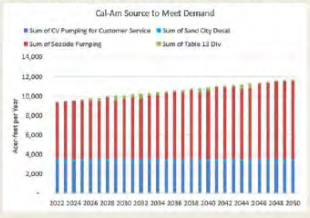
PWM RECHARGE ASSUMPTIONS



MONTGOMERY & ASSOCIATES

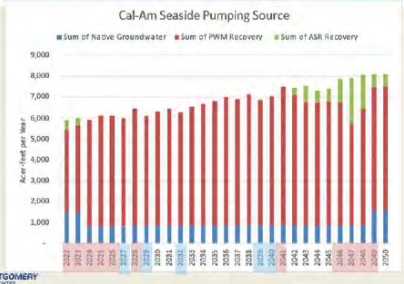
CAL-AM SUPPLY & DEMAND PROJECTION

- Estimated using MPWMD PWM Expansion SEIR supply-demand forecast model, updated for new hydrology period
- Total demand increases from 9,300 AFY to 11,700 AFY from WY2022 to 2050
- Supply Sources:
  - Carmel Valley (CV)
  - Sand City Desal
  - CR Table 13 Div
  - Seaside Pumping
    - Native GW
    - PWM
    - ASR



MONTGOMERY & ASSOCIATES

CAL-AM PROJECTED SEASIDE PUMPING



MONTGOMERY & ASSOCIATES

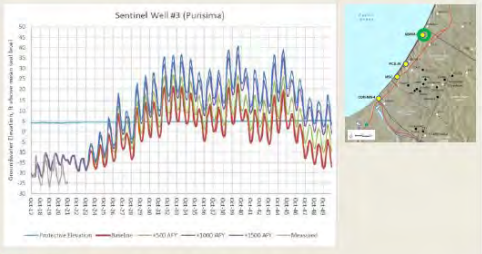
REPLENISHMENT SCENARIOS

- Scenario 0: Updated Baseline – aka "Do-Nothing"
- Scenario 1: 500 AFY of replenishment starting WY2024
- Scenario 2: 1,000 AFY of replenishment starting WY2024
- Scenario 3: 1,500 AFY of replenishment starting WY2024

- Replenishment water injected into the Santa Margarita formation via the PWM DIW wells
- Does not affect projected PWM/ASR recovery by Cal-Am

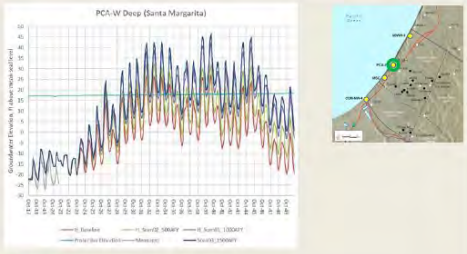
MONTGOMERY & ASSOCIATES

PROTECTIVE ELEVATION HYDROGRAPHS



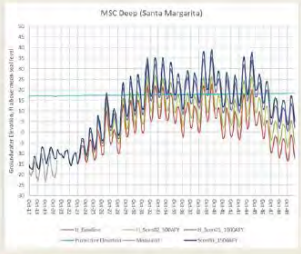
MONTGOMERY & ASSOCIATES

PROTECTIVE ELEVATION HYDROGRAPHS



MONTGOMERY & ASSOCIATES

PROTECTIVE ELEVATION HYDROGRAPHS

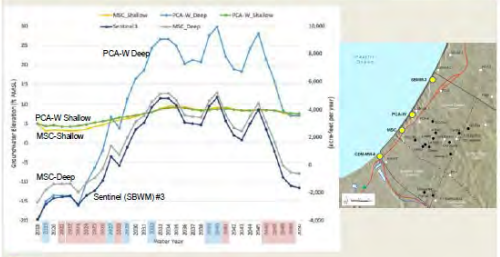


MONTGOMERY & ASSOCIATES

PROTECTIVE ELEVATION HYDROGRAPHS

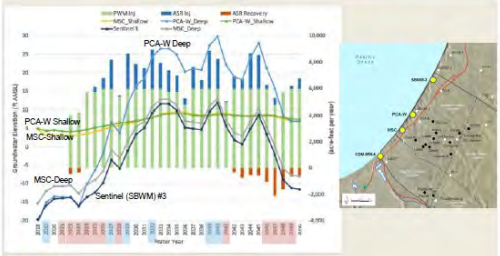
MONTGOMERY & ASSOCIATES

EASIER TO COMPARE ANNUALLY AVERAGED WATER LEVEL TREND



MONTGOMERY & ASSOCIATES

EASIER TO COMPARE ANNUALLY AVERAGED WATER LEVEL TREND



MONTGOMERY & ASSOCIATES

DEEP WELL RESULTS (ANNUALLY AVERAGED WATER LEVEL)

Scenario	1st Year Protective Elevation Reached	# Years to Reach Protective Elevation	# Years ≥ Protective Elevation	% Years Reached	max DH (ft)	$DH_{scenario}$ - $DH_{baseline}$	DH (ft) per 500 AFY increase
Sentinel #3 (Deep)							
Baseline	2031	7	13	52%	28	-	-
1) 500 AFY	2030	6	18	72%	33	5	5
2) 1,000 AFY	2029	5	22	88%	42	14	9
3) 1,500 AFY	2027	3	22	88%	46	18	4
4) 1,500 AFY + Q Redist.	2027	3	21	84%	44	16	-2
PCA-W (Deep)							
Baseline	not reached	not reached	0	0%	30	-	
1) 500 AFY	2033	9	3	12%	35.3	6	6
2) 1,000 AFY	2031	7	14	56%	44.4	15	9.1
3) 1,500 AFY	2030	6	18	72%	48	18	4
4) 1,500 AFY + Q Redist.	2031	7	16	64%	46	16	-2
MSC (Deep)							
Baseline	not reached	not reached	0	0%	25	-	
1) 500 AFY	2033	9	2	8%	30	5	5
2) 1,000 AFY	2032	8	13	52%	38	13	8
3) 1,500 AFY	2030	6	17	68%	41	16	3
4) 1,500 AFY + Q Redist.	2031	7	16	64%	40	14	-2

MONTGOMERY & ASSOCIATES

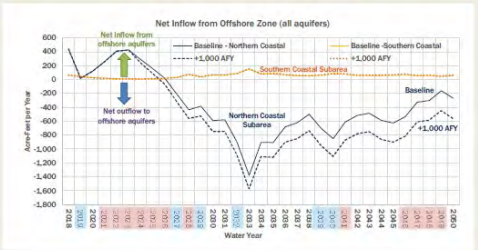
5

SHALLOW WELL RESULTS (ANNUALLY AVERAGED WATER LEVEL)

Scenario	1st Year Protective Elevation Reached	# Years to Reach Protective Elevation	# Years ≥ Protective Elevation	% Years Reached	max DH (ft)	$DH_{scenario}$ - $DH_{baseline}$	DH (ft) per 500 AFY increase
RCA-W (Shallow)							
Baseline	already reached	0	25	100%	4.8	-	-
1) 500 AFY	already reached	0	25	100%	5.2	0.4	0.4
2) 1,000 AFY	already reached	0	25	100%	5.8	1.0	0.5
3) 1,500 AFY	already reached	0	25	100%	6.0	1.2	0.2
4) 1,500 AFY + Q Redist.	already reached	0	25	100%	6.3	1.5	0.3
MSC (Shallow)							
Baseline	not reached	not reached	0	0%	6.3	-	-
1) 500 AFY	not reached	not reached	0	0%	7.1	0.8	0.8
2) 1,000 AFY	2035	11	1	4%	8.0	1.7	0.9
3) 1,500 AFY	2034	10	5	20%	8.5	2.2	0.5
4) 1,500 AFY + Q Redist.	2033	9	10	40%	8.7	2.4	0.2
CDM MW-4 (Shallow)							
Baseline	already reached	0	25	100%	2.4	-	
1) 500 AFY	already reached	0	25	100%	2.4	0.0	0.0
2) 1,000 AFY	already reached	0	25	100%	2.4	0.0	0.0
3) 1,500 AFY	already reached	0	25	100%	2.4	0.0	0.0
4) 1,500 AFY + Q Redist.	already reached	0	25	100%	2.5	0.1	0.1

MONTGOMERY & ASSOCIATES

CHANGE IN NET FLOWS TO/FROM OFFSHORE AQUIFERS



MONTGOMERY & ASSOCIATES

CONCLUSIONS

- Under 1,000 AFY replenishment scenario:
  - protective elevations reached, at least initially, in all protective elevation wells within 11 years
  - average annual groundwater levels remain above protective elevations for over 50% of period in all wells except at MSC Shallow, at which the protective elevation is reached only once, in WY 2035
- Increasing replenishment to 1,500 AFY results in only slight improvement at MSC Shallow, and only marginal increases in protective elevation metrics at the other protective elevation wells

MONTGOMERY & ASSOCIATES

CONCLUSIONS

- There may be limited benefit in trying to further raise the groundwater levels at MSC Shallow by increasing injection in the deeper Santa Margarita formation
- Other alternatives could be evaluated such as:
  - redistributing pumping from Paso Robles to Santa Margarita
  - increasing use of recycled water for irrigation purposes, such as at Mission Memorial Park
  - additional recharge directly to the Paso Robles aquifer

MONTGOMERY & ASSOCIATES

CONCLUSIONS

- The original 2013 replenishment modeling assumed a constant average ASR injection and recovery rate rather having it fluctuate with hydrologic cycles
- The updated simulations that couple ASR and PWM operations to the hydrology illustrate the significant impact that drought, or even below normal periods can have on availability of recharge water and on the timing of reaching and maintaining protective elevations
- Simulated groundwater levels rose quickly in response to replenishment during periods of Normal and Above Normal water years following the prolonged drought at the start of the simulated replenishment period, suggesting that levels would rebound again after the drought at the end of the simulation period

MONTGOMERY & ASSOCIATES

FUTURE CONSIDERATIONS

- Is it sufficient to stay above the protective elevations for most of the time?
  - The 2009 modeling that established the protective elevations was based on a steady state assumption and does not consider for how long a period groundwater levels can drop or stay below protective elevations intermittently without greatly increasing the risk of sea water intrusion
- How would climate change and the potential increased frequency and duration of drought events impact the ability to reach protective elevations?

MONTGOMERY & ASSOCIATES

QUESTIONS?

MONTGOMERY & ASSOCIATES