180/400 GSP Update – Comments and Actions

180/400-Foot Aquifer Subbasin Implementation Committee

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Prepared by

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Water Budget Comments

Comment Topic	Comment/Question	Action/Response
Change in storage in SVIHM and SVOM	**Why is the historical change in storage adjusted?**	Historical groundwater elevation data indicate that the change in storage that makes the water budget equal zero (14,800 AF/yr.) is likely overestimated by the model. Therefore, the change in storage estimate was adjusted based on observed historical data.
	Why is the historical change in storage also applied to the projected water budget?	The adjusted historical change in storage estimate was applied to the projected water budget because the SVOM model is developed based on historical data and therefore likely underestimates change in storage. The adjusted historical decline in storage is used with the adjusted pumping estimates to provide a likely more reasonable estimate for projected sustainable yield. More analysis needs to be done with regards to future recharge.

Current Conditions and Water Budget Comments

Comment Topic	Comment/Question (paraphrased)	Action/Response
Water Budget	The modeled results are 'meaningless' since certain values are adjusted based on observed data and the water budget does not balance to zero.	• SGMA requires inclusion of water budgets that include certain elements; however, sustainability is measured according to the sustainability indicators. • To base the sustainable yield on best available data, the sustainable yield draws on observed data. While the USGS developed the SVIHM based on multiple types of historical data. In bringing together multiple types of data, some values differ from the observed values to develop the best overall 'fit' to observed data. • To develop the sustainable yield, we compared the results from the model the USGS is developing to observed data and determined that best estimate of certain components is observed data instead of model data. • The chapter tries to be transparent with the water budget chapter and sustainable yield estimation by showing the model results, comparing with observed data, and explaining why and how certain components are adjusted to develop the best estimate.

Current Conditions and Water Budget Comments

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Historical Budget	• - "Adjusted" pumping data are internally inconsistent between the modeled and adjusted values; Table 6-2 notes modeled pumping is based on reported data. • - Seawater intrusion is inconsistent with the level adopted by the GSP (Table 6-8 has the modeled value, but Ch 5 calculates a higher value). • - Storage loss is "internally inconsistent": water budget does not balance, and chapter needs to better clarify the 'significant variability and uncertainty' in Section 6.3.2, which is the basis for why the modeled storage loss is not used.	• - Table 6-2 will be clarified to note that ag pumping is based on land use and urban pumping is based on reported values. It is not "internally inconsistent" to note that there are two different estimations based on differing methods. The GSP tries to be transparent by relaying how different methods produce different estimates, and after looking critically at each, explain why one was selected. The GSP attempts to understand why they differ and which is more accurate. The SVIHM is being developed by USGS, so SVBGSA cannot answer why simulations result in certain values, it can only assess how accurate those values are. • - Table 6-8 should also contain the observed seawater intrusion rate that is considered more accurate and will be updated. • - While a water budget conceptually should balance to zero, more accurate values for certain components were selected rather than adjusting numbers so that it could equal zero. More text will be added to clarify why the simulated historical groundwater level and seawater intrusion change are not considered best available data. The groundwater level decline in the model simulations is greater than observed, which leads the model to overestimate change in storge in the non-seawater intruded area. The rate of simulated seawater intrusion is less than observed, which leads the model to underestimate change in storage due to seawater intrusion. The seawater intrusion model under development will provide more accurate estimates of these. Further explanation will be added to the chapter.
Future Budget	• - "Adjusted" values are internally inconsistent because they don't align with Chapter 5 historically observed seawater intrusion observed rates (Table 6-13). • - Need to clarify why the future water budget's estimate of storage is "more reasonable" than the simulated version.	• - Table 6-13 should have the adjusted value for seawater intrusion. That change will be made, along with adding a note in the table regarding where each value came from. • - Further explanation will be added as to why the historical groundwater level and seawater intrusion change are "more reasonable" (see above) and used for the future water budget.

Current Conditions and Water Budget Comments

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Sustainable Yield	Chapter fails to provide enough explanation for rejecting model results (e.g. why some values are based on observed historical values rather than modeled values).	The chapter does note that observed historical values are considered more accurate than some of the modeled values. Further explanation will be added to the chapter to explain the rationale for each value.
Overdraft	Chapter fails to clearly identify overdraft.	Thanks for pointing out where the use of the word 'overdraft' is confusing. The chapter will be revised to more explicitly point out which numbers are the overdraft numbers. Change in groundwater storage is the change in storage due to seawater intrusion and change in storage due to groundwater levels outside of the seawater-intruded area. The numbers are in the chapter, but the chapter will be revised for clarity.
Intersubbasin Flows	Resolve discrepancy between Monterey GSP and GSP Update.	The preliminary SVIHM is poorly calibrated in the Monterey subbasin, which is in part why it is not used for the Monterey GSP. The Monterey GSP is based on a different model that is considered better calibrated to observed water levels than the preliminary SVIHM. Estimates from the SVIHM can be improved and consistency with the Monterey GSP reevaluated, once the model is released and recalibrated to address these types of discrepancies.

Water Budget Comments

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Comments on other groundwater budget components	**Why is the deep percolation of precipitation and applied irrigation component of the groundwater budget about 33% more than the historical average during the dry-normal water year 2016?**	The historical average of this water budget component should not be expected to correlate perfectly with climate designation for any given water year. Deep percolation of irrigation water is not solely dependent on climate conditions; it is also dependent on crop water demand, water application rates, and land use, also influence deep percolation of excess applied irrigation water that do not vary solely based on climate.
	Why is tile runoff so low?	This number (9,000 AF) represents the groundwater portion of tile drain runoff that belongs to the "discharge to drains" component. It represents the net. This component does not represent surface water runoff to the drains; instead, it is the amount of groundwater that seeps into the drains from the underlying aquifer. The surface water budget includes a component representing runoff to streams (overland flow), which includes surface water runoff to drains and is estimated at about 21,400 AF/yr. during the historical period.

Questions