

Presented by Georgina King, Montgomery & Associates Santa Margarita Groundwater Agency June 25, 2020



These are Best Management Practices that has DWR has provided to help guide Sustainable Management Criteria development







This statement was edited by staff based on input received both verbally during the May Board meeting and by email after the meeting.

This is supposed to be a very general statement – more details are provided in the description of what undesirable results would look like, e.g., "Groundwater levels lower than historical low levels that decline at rate greater than X feet over Y consecutive years".

Draft Statement of Significant & Unreasonable Chronic Lowering of Groundwater Levels

Significant & unreasonable chronic lowering of groundwater levels occurs if lowered levels materially impair groundwater supply or cause undue financial burden for a significant number of the Basin's beneficial users or uses.

Note: this statement may change once more is known about interconnected surface water and groundwater dependent ecosystems

This statement was drafted by staff based on input received both verbally during the April Board meeting and by email after the meeting.

This is supposed to be a very general statement – more details are provided in the description of what undesirable results would look like, e.g., "Groundwater levels lower than historical low levels that decline at rate greater than X feet over Y consecutive years". Took out "decline below measured historical low levels" because this is supposed to be a general statement





Graphic showing the relationship between minimum threshold (MT), measurable objective (MO) and interim milestones.



For determining sustainability in a basin, minimum thresholds on their own are not the measure used. SGMA has mandated that we define Undesirable Results for each sustainability indicator that rely on minimum thresholds. Minimum Threshold and Undesirable Results are related to each other.



Refresher slide of what Undesirable Results are



These are considerations discussed at previous Board meetings or provided in emails after the April and May Board meetings. These have been used to guide development of the chronic lowering of groundwater level sustainability criteria



We need to consider undesirable results to help in selecting minimum thresholds as they work together.



If you select a MT below historical levels it may be easier to remain above it in the future so potentially you could say no wells have exceed their respective MTs. If more flexibility is needed to avoid undesirable results, a certain percentage of representative monitoring points could alternatively be allowed to exceed the MT in a year.



If the higher MT is selected, you will need to build more flexibility into your undesirable results by allowing for a certain amount of exceedances. These can be based on time and rate.



We are looking for a standardized method of determining what the minimum threshold should be for representative monitoring points. We have looked at three options so far. 2x standard deviation should account for 95% of the water levels, or all but 2.5% of the water levels at the low end of the range, making it a good statistical indicator of outlying values below the average. 1 x standard deviation of the minimum level provides for water levels to fall below the historical minimum level by a depth equal to the deviation from average that 68% of levels experience

The standard deviation is like a ruler for judging whether a particular data point is really wacky (or not)



How measurable objectives are set for each representative monitoring point depends on what changes in groundwater levels are desired. Where the goal is to maintain levels where they are now, an average level is used. If some level of recovery is desired, then an achievable level will be derived from the groundwater model which has the ability to predict groundwater levels while considering climate change, and projects & management actions.



The groundwater level measurable objectives for different areas of Santa Margarita aquifer are to increase levels in the Pasatiempo area where dewatering has occurred; and to maintain groundwater levels in the rest of the Basin where permanent declines have not occurred.

	 INCREASE levels in the Scotts Valley area 	P
Approach for Setting Measurable Objectives	 ⇒ PMAs in the Scotts Valley area will likely not target this "aquifer" since it is not a reliable aquifer. Modeling will determine if increasing levels in the Santa Margarita and 	
Monterey	increases its levels	20 300 5 550 20 100 1102 1104 1105 1105 1100 1102 1104 1105 1105 200 2002 2004 2010 2012 2014 2014 2016 2015
Formation	⇒ Use groundwater model to determine increased groundwater levels	Water Var Classification Wei Bernal Dy Collecting Dy
	► MAINTAIN levels elsewhere	18

Although there are no wells in which to monitoring groundwater levels in the Monterey Formation, the only well with a long-term record of levels is SVWD #9 that is in the general area where the Santa Margarita aquifer is dewatered. Its groundwater levels will increase coincidentally with increased levels in the Santa Margarita and Lompico aquifers. The model will need to be used to determine how much of an increase might take place and therefore what the measurable objective could be.



In the Scotts Valley area where there has been 150 feet of decline, the Board has indicated that some level of groundwater level recovery is desired. How much of an increase can take place is dependent on cost effective projects and management actions. The model will be used to determine the measurable objectives. There are no other long-term data for groundwater levels in other parts of the Basin and therefore it is assumed that users are okay with the status quo and the objective will be to maintain levels.



The Butano aquifer is not well understood in the area where it is most pumped by SVWD because its extraction wells are screened across both the Lompico and Butano aquifers. The groundwater level data available are therefore a composite of the two aquifers. Until the Butano aquifer is understood more fully with the aid a deep dedicated monitoring well screened only in the Butano aquifer near the municipal Butano extraction wells, the measurable objective will seek to maintain groundwater levels.



There is no correct answer in developing SMCs and we are not expected to get it right at our first attempt



Hydrographs will include lines showing measurable objective and 3 minimum threshold options



SLVWD Quail MW-B is selected as a representative monitoring point (RMP) as it represents the groundwater levels of the nearby extraction wells (SLVWD Quail Hollow #4A and #5A). The other hydrographs have been normalized to SLVWD Quail MW-B so they can be compared easier with the RMP. The three different options for minimum thresholds are shown on the hydrograph together with the measurable objective (average groundwater levels over the period of record for the RMP).



SLVWD Pasatiempo MW-1 (orange and blue color represent different trend period on the hydrograph) is selected as a representative monitoring point (RMP) as it represents groundwater levels of the nearby wells. The three different options for minimum thresholds are shown on the hydrograph. The measurable objective is not shown as this needs to be determined using the groundwater model.



SLVWD Canham is selected as a representative monitoring point (RMP) as it one of the few monitoring well sin the Butano aquifer and is the closest to the production wells SVWD #3B and Orchard Well pumping in the Lompico/Butano aquifers. The Stonewood Well hydrograph is normalized to Canham Well's hydrograph so they can be compared easier. The three different options for minimum thresholds are shown on the hydrograph together with the measurable objective (average groundwater levels over the period of higher levels). The 25 ft increase in levels at the start of the monitoring data don't seem correct so those are excluded from the average.



To recap, these are the three minimum threshold options we have presented. It would be preferable to use one option to determine minimum thresholds for all representative monitoring points. However, it may be necessary to use a different option for some wells because the data requires a different approach. Potential undesirable results that accommodate flexibility are provided as examples for each MT option. We'd like feedback from Board members on what their preference would be.



