

Edits (P. 3)

8.1 Definitions

□ **Minimum thresholds** refer to numeric values for each sustainability indicator used to define undesirable results.

Minimum thresholds are indicators of where an unreasonable condition might occur. For example, current groundwater elevations might be a minimum threshold if lower groundwater elevations would result in significant and unreasonable costs.

8.2 Sustainability Goal

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The projects and management actions are designed to achieve sustainability within 20 years by one or more of the following means:

- Tiered groundwater pumping fees to promote conservation and fund water supply projects. The tiered fees could be established to promote pumping within the sustainable yield. Pumping that exceeds the sustainable yield would be subject to the higher tiered fees that would fund projects the GSAs find to be cost effective solutions to sustainable management.
- Diligent adherence to Best Management Practices and increased awareness to achieve decreased groundwater use will be pursued.
- Pumping rates could be ramped down until the cumulative pumping rate is at or below the sustainable yield of the Subbasin. This would ensure that the future pumping is within the sustainable yield, which would prevent further lowering of groundwater levels.
- Expanded use of recycled water to offset groundwater pumping in the Subbasin will be pursued. This would contribute to reducing groundwater pumping below its current levels and prevent further lowering of groundwater levels.
- Long-term and short-term contracts for excess surface water from the Nacimiento Reservoir to offset groundwater pumping in the Subbasin would contribute to reducing groundwater pumping below its current levels and prevent further lowering of groundwater levels.
- Long-term and short-term contracts for State Water Project water from the Coastal Branch Aqueduct to offset groundwater pumping in the Subbasin would contribute to reducing groundwater pumping from its current levels and prevent further lowering of groundwater levels.
- Storm water infiltration projects would increase basin recharge.
- Increased reservoir storage behind the Salinas Dam could provide additional water for either direct or in-lieu recharge.

- Enhanced best management practices for crop irrigation could minimize water loss from irrigation systems and agricultural reservoirs.

8.4 Chronic Lowering of Groundwater Levels Sustainable Management Criteria (p. 6)

8.4.1 Locally Defined Significant and Unreasonable Conditions

Locally defined significant and unreasonable conditions were determined based on hydrogeologic data and understanding, GSA input, the Sustainable Management Criteria survey, public meetings, and discussions with GSA staff. Significant and unreasonable groundwater levels in the Subbasin are those that:

- Cause significant financial burden to those who rely on the groundwater resource
 - Increased pumping costs due to greater lift
 - Shallow domestic wells going dry
 - Cost for deeper installation or construction of new wells
- Require reductions in groundwater extraction creating directly proportional reductions in the area economy
- Significantly interfere with other sustainability indicators

8.4.2 Minimum Thresholds (P. 7)

Section §354.28(c)(1) of the SGMA regulations states that “*The minimum threshold for chronic lowering of groundwater levels shall be the groundwater elevation indicating a depletion of supply at a given location that may lead to undesirable results.*”

8.4.2.1 Information and Methodology Used to Establish Minimum Thresholds and Measurable Objectives

The information used for establishing the chronic lowering of groundwater levels minimum thresholds include:

- Information about public definitions of significant and unreasonable conditions and desired groundwater elevations, gathered from the SMC survey and public outreach meetings.
- Feedback about significant and unreasonable conditions gathered during public meetings.
- Historical groundwater elevation data from wells monitored by the County of San Luis Obispo
- Depths and locations of existing wells
- Maps of current and historical groundwater elevation data

Initial minimum thresholds and measurable objectives were established using the process described below.

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Based on hydrogeologic data and understanding of the Basin, the survey and public outreach results, historical groundwater elevations from monitoring wells that represented desired conditions were identified. These desired conditions were used to establish the initial measurable objectives and reasonable minimum thresholds in the Subbasin.

Paso Robles Formation Aquifer. Initial minimum thresholds were set using 2017 groundwater elevations. The thresholds were also based on current and historic groundwater elevations from monitoring wells along with depth of existing wells and of the aquifer in each area of the Basin represented by each specific monitoring well. 2017 standing groundwater levels have been selected as measurable objectives and minimum thresholds are set below those levels and sufficiently above the bottom of adjacent wells to protect groundwater extraction. Groundwater trends are analyzed and relative rates of decline of autumn standing groundwater levels over the last five years are projected to 2025 as an initial elevation for the minimum threshold. This allows at least a five year period for the Agency to begin GSP implementation. The numeric groundwater level selected at each monitoring site to represent the minimum threshold beyond which undesirable results may occur are adjusted to reflect the specific conditions at each monitoring site and the adjacent portion of the Basin the monitoring site is selected to reflect. Protecting a sustainable groundwater supply for existing wells was a guiding consideration. Minimum thresholds were selected to allow

8.4.2.7 Effects on Beneficial Users and Land Uses (p. 16 + 17)

The groundwater elevation minimum thresholds may have several effects on beneficial users and land uses in the Subbasin.

Agricultural land uses and users. The groundwater elevation minimum thresholds limit lowering of groundwater levels in the Subbasin. In the absence of other effective measures this has the effect of potentially limiting the amount of groundwater pumping in the Subbasin. Limiting the amount of groundwater pumping will limit the amount and type of crops that can be grown in the Subbasin, which could result in a proportional reduction in the economic viability of some properties. The groundwater elevation minimum thresholds could therefore limit expansion of the Subbasin's agricultural economy. This could have various effects on beneficial users and land uses:

8.4 Chronic Lowering of Groundwater Levels Sustainable Management Criteria

8.4.4 Undesirable Results (P 24)

8.4.4.1 Criteria for Defining Undesirable Results

The chronic lowering of groundwater elevation undesirable result is a quantitative combinations of groundwater elevation minimum threshold exceedances. For the Paso Robles Subbasin, the groundwater elevation undesirable result is:

Over the course of two years, no more than two exceedances for the groundwater elevation minimum thresholds within a 5-mile radius or within a defined management area of the Basin for any single aquifer. If a single monitoring well is in exceedance for two consecutive years also represents an undesirable result for the area of the Basin represented by the monitoring well. Geographically

isolated exceedances will require investigation to determine if local or Basin wide actions are required in response.

Undesirable results provide flexibility in defining sustainability. Increasing the number of allowed minimum threshold exceedances provides more flexibility, but may lead to significant and unreasonable conditions for a number of beneficial users. Reducing the number of allowed minimum threshold exceedances ensures strict adherence to minimum thresholds, but reduces flexibility due to unanticipated hydrogeologic conditions. The undesirable result was set to balance the interests of beneficial users with the practical aspects of groundwater management under uncertainty. As the monitoring system grows, the number of exceedances allowed may be adjusted. One additional exceedance will be allowed for approximately every seven new monitoring wells. This was considered a reasonable number of exceedances given the hydrogeologic uncertainty of the basin. Close monitoring of groundwater data over the following years will allow actual numbers to be refined based on observable data. Management of the Basin will adapt to specific conditions and to a growing understanding of basin conditions and processes to adopt appropriate responses.

8.5 Reduction in Groundwater Storage Sustainable Management Criteria

(p. 26) 8.5.1 Locally Defined Significant and Unreasonable Conditions

Locally defined significant and unreasonable conditions were assessed based on the Sustainable Management Criteria survey, public meetings, available data, and discussions with GSA staff. Significant and unreasonable changes in groundwater storage in the Subbasin are those that:

- Lead to long-term reduction in groundwater storage
- Interfere with other sustainability indicators

Responses to the Sustainable Management Criteria survey and public input suggest that most areas of the basin would like to see more groundwater in storage to help with droughts, and some areas of the basin would like to see significantly more groundwater in storage. Public input on which concessions would be acceptable to increase the amount of groundwater in storage revealed two highly ranked concessions:

1. New pumping be offset with new recharge or reduced pumping
2. Pumping be reduced in dry years

However, the concession that agricultural pumping be reduced in all years ranked relatively low. This suggests that, while stakeholders would prefer more groundwater in storage, they also would not prefer to reduce existing agricultural pumping during average years. Stakeholders also prefer that groundwater storage be increased by retaining wet year flows for local recharge and/or importing water.

8.5.2 Minimum Thresholds (p. 26)

Section §354.28(c)(2) of the SGMA regulations states that *“The minimum threshold for reduction of groundwater storage shall be a total volume of groundwater that can be withdrawn from the basin*

without causing conditions that may lead to undesirable results. Minimum thresholds for reduction of groundwater storage shall be supported by the sustainable yield of the basin, calculated based on historical trends, water year type, and projected water use in the basin.”

The reduction of groundwater in storage minimum threshold is established for the Subbasin as a whole, not for individual aquifers. Therefore, one minimum threshold for groundwater in storage is established for the entire Subbasin, but any reduction in storage that would cause an undesirable result in only a limited portion of the basin shall be addressed in that area or areas where declining well levels indicate actions or projects will be effective..

In accordance with the SGMA regulation cited above, the minimum threshold metric is a volume of pumping per year, or an annual pumping rate. Conceptually, the total volume of groundwater that can be pumped annually from the Subbasin without leading to undesirable results is equal to the estimated sustainable yield of the Subbasin. As discussed in Chapter 6, absent the addition of supplemental water, the future estimated long-term sustainable yield of the Subbasin under reasonable climate change assumptions is 61,100 AFY. This estimated sustainable yield will change in the future as additional data become available.

This GSP adopts changes in groundwater elevation as a proxy for the change in groundwater storage metric. As allowed in § 354.36(b)(1) of the SGMA regulations, groundwater elevation data at the RMSs will be reported annually as a proxy to track changes in the amount of groundwater in storage.

The minimum threshold for change in groundwater storage is *the minimum threshold for chronic lowering of groundwater levels minimum threshold*. Based on well-established hydrogeologic principles, stable groundwater elevations held above this minimum threshold represent no change in groundwater storage . Therefore, the minimum threshold using groundwater elevations as a proxy is that the long term groundwater elevation averaged across all the wells in the groundwater level monitoring network will remain above the minimum threshold for chronic lowering of groundwater levels minimum threshold.

Exceedances of this minimum threshold, if limited to specific areas of the Basin, shall be addressed by projects or management actions taken where they will effect those areas of exceedance. Multiple exceedances appearing across the Basin will require proportional Basin wide responses.

8.5.2.4 Effect on Beneficial Uses and Users (P. 28)

The reduction in groundwater storage minimum threshold of maintaining stable average groundwater elevations along with its proxy, will potentially require a reduction in the amount of groundwater pumping in the Subbasin. Reducing pumping may impact the beneficial uses and users of groundwater in the Subbasin.

edits for 8.8.2.1 subsidence – reasonable and justifiable (P. 42)

8.8.2 Minimum Thresholds for Land Subsidence Management Criteria

Section 354.28(c)(5) of the SGMA regulations states that “*The minimum threshold for land subsidence shall be the rate and extent of subsidence that substantially interferes with surface land uses and may lead to undesirable results.*”

8.8.2.1 Information Used and Methodology for Establishing Subsidence Minimum Thresholds

The information used for establishing the land subsidence minimum thresholds included:

- Historical land surface elevation data from continuous GSP locations in the Subbasin
- Feedback about significant and unreasonable conditions gathered from GSA staff members and stakeholders

Land surface elevation is measured by the University NAVSTAR Consortium (UNAVCO) at five continuous global positioning system (GPS) sites in and around the Subbasin (Figure 7-5). Minimum thresholds for subsidence are set at these five locations. The basis for the subsidence minimum threshold is to protect against long term subsidence that would create significant undesirable results. The five GPS sites in the monitoring network have displayed multi-year land surface fluctuations that do not display a long-term decline in land elevation that indicate subsidence is occurring in the Subbasin. Since 2001 four of the five stations show ground surface elevations are trending upwards. The historical land surface fluctuations at these five sites demonstrate that a decline in land surface observed in one year may be compensated for by a similar rise in land surface the following year.

Discussions with GSA staff and the public indicated that, people were generally in agreement with the goal of no significant subsidence that would harm infrastructure.

Rate of Subsidence. Any rate of subsidence, if maintained over a long period of time, could lead to significant and unreasonable conditions. A rate of subsidence that would represent significant loss of groundwater storage or produce significant harm to infrastructure over the following twenty years would be unreasonable. An unacceptable rate of subsidence is one that exceeds half inch (0.041 foot) per year over any five year period. Annual land surface fluctuations are acceptable, they occur naturally and do not indicate long-term subsidence.

As shown on Figure 7-6, most of the continuous GPS surface elevation monitors show more years with an annual rise in land surface elevation than not. This rise is likely part of a longer-term trend, and does not appear to be related to seasonal elastic subsidence. The maximum measured rate of rise for each of the five continuous GPS sites is tabulated in Table 8-10.

Extent of Subsidence. An amount of subsidence sufficient to damage infrastructure in any portion of the Subbasin would be significant and unreasonable. Therefore, the same minimum threshold is set for all five of the existing continuous GPS sites.

The State has suggested that there will likely be assistance available in the future for periodic USGS Lidar surveys that give very exacting surface elevation maps that when compared over time could be used to track changes across the whole Basin Surface.

Land Surface Elevation Monitoring Data

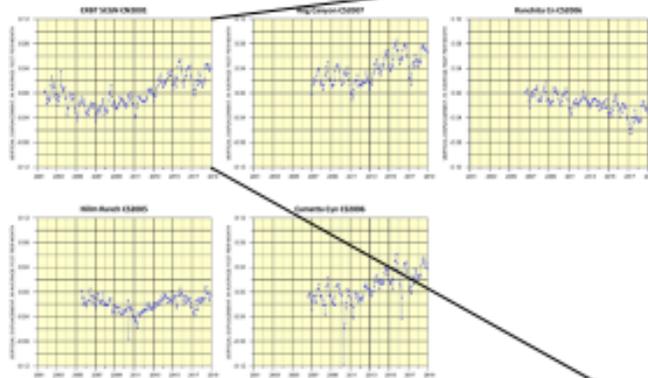


Figure 7-6. Monthly Averages of Vertical Displacement at UNAVCO Continuous GPS Stations

