ES EXECUTIVE SUMMARY

This Groundwater Sustainability Plan (GSP) fulfills the requirements of the Sustainable Groundwater Management Act (SGMA) for the Paso Robles Subbasin of the Salinas Valley Basin. The GSP describes the Paso Robles Subbasin, develops quantifiable management objectives that consider the interests of the Subbasin's beneficial groundwater uses and users, and identifies management actions and conceptual projects that will allow the Subbasin to achieve sustainability by 2040. This GSP covers the entire Paso Robles Subbasin. The Paso Robles Subbasin GSP has been jointly developed by four Groundwater Sustainability Agencies (GSAs):

- City of Paso Robles GSA
- Paso Basin - County of San Luis Obispo GSA
- San Miguel Community Services District (CSD) GSA
- Shandon - San Juan GSA

ES-1 Plan Area

The Paso Robles Subbasin lies completely within San Luis Obispo County. The Subbasin is bounded by two groundwater basins and two subbasins, as shown on Figure ES-1. The Subbasin includes the incorporated City of Paso Robles. The Subbasin additionally includes the unincorporated census-designated places of Shandon, San Miguel, Creston, Cholame, and Whitley Gardens.

The Subbasin is drained by the Salinas River. Primary tributaries to the Salinas River include the Estrella River, Huer Huero Creek, and San Juan Creek. Highway 101 is the most significant north-south highway in the Subbasin, with Highways 41 and 46 running east-west across the Subbasin.

The Subbasin currently has two water source types: groundwater and imported surface water. Until 2015, all water demands in the Subbasin were met with groundwater. Water demands in the Basin are organized into the six water use sectors identified in the SGMA Regulations. Agriculture is the largest water use sector as measured by water use. Native vegetation is the largest water use sector as measured by land area.

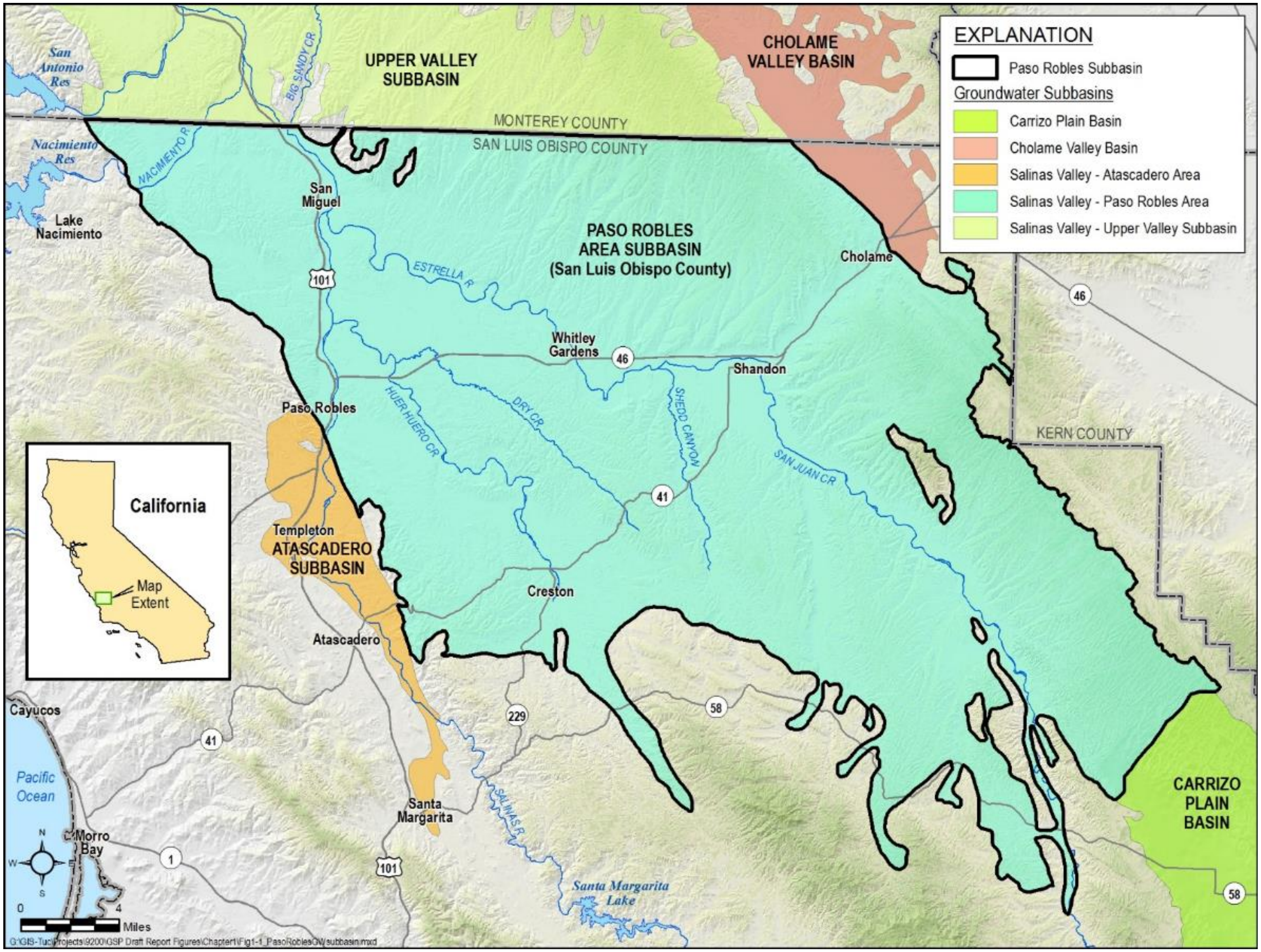

Figure ES-1: Paso Robles Subbasin Location

ES-2 Stakeholder Outreach

A stakeholder outreach and engagement strategy was developed to consider the concerns and ideas of a broad cross-section of stakeholders in the Subbasin. The stakeholder outreach strategy is detailed in Chapter 11 – Notice and Communication and Appendix F – Communications and Engagement (C&E) Plan.

Outreach and communication throughout GSP development included regular presentations at Cooperative Committee meetings, meetings with community groups, meetings with individual stakeholders, and community meetings. Comments from stakeholders were collected with a computerized system, and each GSA reviewed and considered the comments from their stakeholders. To date, over 190 comments have been received and reviewed by the GSAs.

ES-3 Subbasin Geology and Hydrogeology

Two mapped geologic formations constitute the primary water bearing formations in the Subbasin: the Quaternary Alluvium bordering streams and rivers, and the Plio-Pleistocene Paso Robles Formation. The Alluvium is typically no more than 100 feet thick and comprises coarse sand and gravel with some fine-grained deposits. The Alluvium is generally coarser than the Paso Robles Formation, with higher permeability. Well production capacities often exceed 1,000 gallons per minute (gpm) from the Alluvium. The Paso Robles Formation constitutes most of the Subbasin, with depths up to 3,000 feet thick in some places. This formation comprises relatively thin, often discontinuous sand and gravel layers interbedded with thicker layers of silt and clay. The formation is typically unconsolidated and generally poorly sorted. The sand and gravel beds in the Paso Robles Formation have lower permeability compared to the overlying Alluvium. These two geologic formations constitute the two principal aquifers in the Subbasin. Underlying and surrounding the Subbasin are various geologic formations including Tertiary-age or older consolidated sedimentary beds, Cretaceous-age metamorphic rocks, and granitic rock.

ES-4 Existing Groundwater Conditions

Groundwater elevations in some portions of the Subbasin have been declining for many years, while groundwater elevations in other areas of the Subbasin have remained relatively stable.

ES-4.1 Groundwater Flow Conditions

Groundwater elevations in the Alluvial Aquifer range from an elevation of approximately 1,400 feet above mean sea level (NAVD88) in the southeastern portion of the Subbasin to an elevation of approximately 600 feet above mean sea level near San Miguel. Groundwater flow generally follows the alignment of the creeks and rivers. The average horizontal hydraulic gradient in the Alluvial Aquifer is about 0.004 ft/ft from the southeastern portion of the Subbasin to San Miguel.

Groundwater elevations in the Paso Robles Formation Aquifer range from about 1,300 feet above mean sea level in the southeast portion of the Subbasin to about 550 feet above mean sea level near the City of Paso Robles and the town of San Miguel. Groundwater flow direction is generally to the northwest and west over most of the Subbasin, except in the area north of Paso Robles where groundwater flow is to the northeast. Groundwater flow in the western portion of the Paso Robles Formation Aquifer converges towards pumping depressions. Groundwater gradients range from approximately 0.003 ft/ft in the southeast portion of the Subbasin to approximately 0.01 ft/ft in the areas both southeast of Paso Robles and northwest of Whitley Gardens.

ES-4.2 Groundwater Storage

Groundwater model results for a simulation period 1981 through 2011 indicate that approximately 369,000 AF were lost from storage in the Paso Robles Formation Aquifer.

ES-4.3 Subsidence

Three years of recent Interferometric Synthetic Aperture Radar (InSAR) data provided by the California Department of Water Resources (DWR) suggests that there was only a minor amount of historical subsidence in small areas of the Subbasin over this period. Pumping induced subsidence is not a major concern for the Subbasin. Under this GSP, the GSAs will monitor subsidence annually using DWR’s InSAR data.

ES-4.4 Interconnected Surface Water and Groundwater

There are no available data that establish whether or not the groundwater and surface water are connected through a continuous saturated zone in any aquifer. The potential for interconnected surface water and groundwater in the Subbasin will be assessed during GSP implementation.

ES-4.5 Groundwater Quality

Groundwater quality in the Subbasin is generally suitable for both municipal and agricultural uses. The most common drinking water quality standard exceedance in the Subbasin is Total Dissolved Solids (TDS). The second most common drinking water quality standard exceedance in the Subbasin is nitrate. No mapped groundwater contamination plumes from point sources exist in the Subbasin. Some historical groundwater samples from the Subbasin suggest slight to moderate restriction on irrigation use due to sodium or chloride toxicity.

ES-5 Water Budgets

Water budgets for the Paso Robles Subbasin were estimated using an integrated set of three models including a watershed model, a soil balance model, and a groundwater model. Water budgets were developed for historical, current, and future conditions. The future conditions modeled included climate change based on the approach developed by DWR. Both surface water and groundwater budgets were developed for all three time periods.

Historical and current groundwater budgets indicate a persistent groundwater storage decline in the Subbasin in the Paso Robles Formation Aquifer. Similarly, the future groundwater budget suggests continued groundwater storage decline if current water use practices continue. Historical, current, and projected sustainable yields were estimated based on the difference between current pumping practices and calculated groundwater storage deficits. While these calculated sustainable yields are a reasonable estimate of the long-term pumping that can be maintained without producing undesirable results, the definitive sustainable yield can only be determined once data show undesirable results have not occurred. Table ES-1 presents the general components of the three groundwater budgets, along with estimates of the historical, current, and projected sustainable yield. The sustainable yield for the current water budget period represents drought conditions, and therefore is not indicative of a long-term sustainable yield.

Table ES-1: Historical, Current, and Future Groundwater Budget Components

Groundwater Inflow Component	Historical	Current	Future
Streamflow Percolation	26,900	2,700	28,800
Agricultural Irrigation Return Flow	17,800	13,100	14,500
Deep Percolation of Direct Precipitation	12,000	1,400	12,600
Subsurface Inflow into Subbasin	10,100	4,900	8,300
Wastewater Pond Percolation	3,400	4,700	3,500
Urban Irrigation Return Flow	1,200	2,100	1,800
Total	71,400	28,900	69,500
Groundwater Outflow Component	**Historical**	**Current**	**Future**
Total Groundwater Pumping	72,400	85,800	74,800
Discharge to Streams and Rivers from Alluvial Aquifer	7,300	4,300	4,600
Groundwater Flow Out of Subbasin	2,600	2,500	2,100
Riparian Evapotranspiration	1,700	1,700	1,700
Total	84,000	94,300	83,200
Sustainable Yield Estimate	**Historical**	**Current**	**Future**
	59,800	20,400	61,100

ES-6 Monitoring Networks

Achieving sustainability will be demonstrated in the data collected from monitoring networks over the GSP implementation horizon. Monitoring networks are developed for four of the five applicable sustainability indicators in the Subbasin. Seawater intrusion is not applicable in the Paso Robles this Subbasin. While conceptually applicable, a monitoring network for the depletion of interconnected surface waters was not developed for the GSP, but will be developed in the future if new data indicate an interconnection exists.

All monitoring networks presented in the GSP are based on existing monitoring sites. The monitoring networks are limited to locations with data that are publicly available and not collected under confidentiality agreements. It will be necessary after GSP adoption to expand the existing monitoring networks sites to fully demonstrate sustainability, refine the hydrogeologic conceptual model, and improve the GSP model. The monitoring networks are designed to accomplish the following:

- Demonstrate progress toward achieving measurable objectives described in the GSP
- Identify impacts to the beneficial uses and users of groundwater
- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds
- Quantify annual changes in water budget components

There are currently 23 wells in the groundwater elevation monitoring network, 22 wells in the Paso Robles Formation Aquifer and one new well owned by the City of Paso Robles in the Alluvial Aquifer. An additional nine potential future monitoring wells that have publicly available data were also identified, but the aquifer in which they are screened is unknown. These nine wells will be added to the monitoring network after the well completion information has been verified and they have been assigned to the appropriate aquifer. The locations of the groundwater elevation monitoring wells are shown on Figure ES-2.

This GSP adopts groundwater elevations as a proxy for estimating change in groundwater storage. The groundwater elevation monitoring wells shown on Figure ES-2, will also be used to monitor change in groundwater storage.

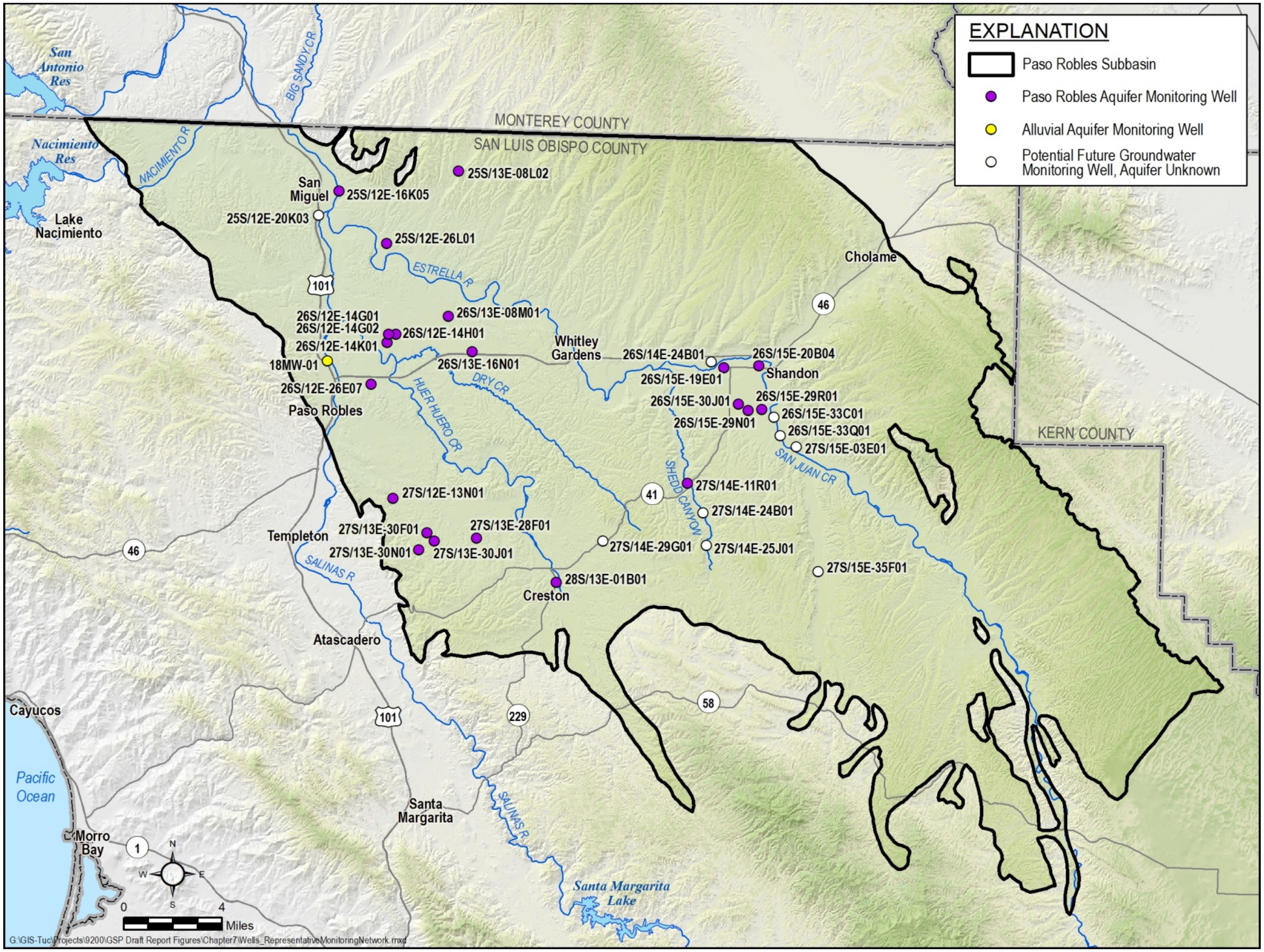

Figure ES-2: Groundwater Elevation Monitoring Well Locations

Degradation of groundwater quality is measured using existing wells. In particular, this GSP leverages groundwater quality data reported to the State Division of Drinking Water and groundwater quality data gathered as part of the State's Irrigated Lands Regulatory Program (ILRP). These two data sources provide a geographically extensive and complete network of wells to monitor groundwater quality in the Subbasin.

Land subsidence is monitored in the Subbasin with InSAR data provided by DWR. These data cover the years 2015 to 2018, and are adequate to identify areas of recent subsidence. One or more GSAs may opt to contract with USGS or others with expertise in subsidence to gather any additional datasets and evaluate the cause(s) of any identified subsidence. The GSAs will continue to annually assess subsidence using the DWR provided InSAR data.

ES-7 Sustainable Management Criteria

Sustainable Management Criteria are the metrics by which sustainability is measured. Sustainable management criteria, including significant and unreasonable conditions, minimum thresholds, measurable objectives, and undesirable results, are established for four of the five applicable sustainability indicators in the Subbasin. Seawater intrusion is not applicable to this Subbasin. Because data are insufficient to determine if surface water and groundwater are interconnected, sustainable management criteria were not established for the depletion of interconnected surface water sustainability indicator.

Sustainable management criteria were developed with considerable public input and review, including:

- Holding a series of public outreach meetings.
- Surveying the public and gathering input on minimum thresholds and measurable objectives.
- Analyzing survey results to assess preferences and trends relevant to Sustainable Management Criteria.
- Combining survey results, outreach efforts, and hydrogeologic data to set initial conceptual minimum thresholds and measurable objectives.
- Conducting public meetings to present initial Sustainable Management Criteria and solicit additional public input.
- Reviewing public input on preliminary Sustainable Management Criteria with the GSAs.
- Modifying criteria based on public input and GSA recommendations.

The groundwater elevation measurable objective for each representative monitoring site in the monitoring network was set to the well's average 2017 groundwater elevation. The groundwater elevation minimum thresholds for each monitoring well was set to an elevation 30 feet below the measurable objective. Analysis of historical groundwater elevation data suggested that 30 feet allows for reasonable operational flexibility that accounts for seasonal and anticipated climatic variations on groundwater elevation.

Both the minimum threshold and measurable objectives for change in storage are set -to no long-term change in storage in the Subbasin. After the subbasin achieves sustainability, there will be no ongoing loss of groundwater in storage.match the standing groundwater level elevations that protect against chronic lowering of groundwater levels as a proxy. Standing groundwater levels are the most reliable and most easily measurable metric to protect groundwater in storage.

This GSP sets minimum thresholds for the degradation of groundwater quality as a number of supply wells. Some supply wells already exceed groundwater quality standards. This GSP is not designed to remediate these existing exceedances. Therefore, the minimum thresholds and measurable objectives allow all existing exceedances, plus exceedances in an additional 10% of the monitoring wells. This allows for some flexibility in managing groundwater quality, while not allowing substantial degradation of groundwater quality.

Both the minimum threshold and measurable objectives for subsidence are set to no long-term decline in ground surface elevation in the Subbasin.

ES-8 Projects and Actions to Attain Sustainability

The primary approach to attaining sustainability will begin with Best Management Practices, voluntary fallowing of irrigated crops and developing projects that will reduce or eliminate any shortfall. Achieving sustainability in areas of the Subbasin where groundwater levels continue to decline will rely on management actions that reduce groundwater pumping. Both basin-wide and area specific management actions will be undertaken. Basin-wide management actions include monitoring and outreach, promoting best management practices for water use, promoting stormwater capture and recharge, and promoting voluntary fallowing of irrigated land following.

Area specific management actions involve mandatory limitations on pumping in certain areas. The GSAs will establish a regulatory program to identify and enforce required pumping limitation as necessary to arrest persistent groundwater elevation declines in specific areas. The amount of mandatory pumping limitations is uncertain and will depend on the effectiveness and timeliness of voluntary actions by pumpers to limit pumping and implementing projects as well as the extent of the specific areas identified for mandatory limitations.

Developing and adopting the regulations for mandatory pumping limitations will require substantial negotiations between the GSAs, public hearings, and environmental review (CEQA). Regulations A regulatory program adopted by individual GSAs related to pumping limitations would need to be substantially identical to assure a consistent methodology for identifying those areas across the Subbasin. After GSP adoption, developing the ~~pumping limitation regulations~~regulatory program will require the following steps:

1. Establishing a methodology for determining baseline pumping in specific areas considering:
    a. Groundwater elevation trends in areas of decline and estimated yield in that area
    b. Land uses and corresponding irrigation requirements
2. Establishing a methodology to determine whose use must be limited and by how much considering, though not limited to, water rights and evaluation of anticipated benefits from projects bringing in supplemental water or other relevant actions individual pumpers take.
3. A timeline for limitations on pumping ("ramp down") in specific areas as required to avoid undesirable results
4. Approving a formal ~~regulation~~ regulatory program to enact the program

Projects that supplement the Subbasin's water supply may be implemented by willing entities to offset pumping and lessen the degree to which the management actions would be needed. ~~Implementing specific projects are not included in this GSP.~~Certain projects for augmenting groundwater are discussed Chapter 9 and in Appendices J and L . Project specifics and implementation will be pursued by willing entities in the future following extensive study and planning.

ES-9 Plan Implementation

Implementation of the GSP requires robust administrative and financial structures, with adequate staff and funding to ensure compliance with SGMA. The GSP calls for GSAs to routinely provide information to the public about GSP implementation and progress towards sustainability and the need to use groundwater efficiently. GSAs will likely ~~either individually~~as a group hire consultant(s) or ~~hire~~ staff to implement the initial phases of GSP ~~after deciding which GSA will lead each task~~implementation.

A conceptual planning-level cost of about $7,800,000 will cover planned activities during the first five years of implementation. This equates to an estimated cost of $1,560,000 per year. This cost estimate reflects routine administrative operations, public outreach, and the basin wide and area specific management actions. The GSP will be implemented under the terms of the existing MOA between the four GSAs until DWR approves the GSP and a new or renewed cooperative agreement is established. Consistent with the current MOA, an annual operating budget will be established that is considered for approval by each GSA.