

Can One Wet Year Wash Away the Paso Robles Basin's Water Worries?

SUMMARY

The record-setting snow and rainfall in 2023 are filling our reservoirs here in San Luis Obispo County (County). As the water percolates down, we can expect to see improved water levels in the Paso Robles Groundwater Basin (Paso Basin). While this increase in reserves is valuable, past precipitation history and future models indicate that drier years will continue to be our norm in the County. Users in the Paso Basin typically pump more water than the rainfall recharges, creating a basin in overdraft.

In 2014, the State of California (State) enacted the Sustainable Groundwater Management Act (SGMA) to help protect groundwater resources. This act prioritized basins of concern and required the Paso Basin to create a Groundwater Sustainability Plan (GSP). Diligent work has gone into creation of the Paso Basin GSP, which was approved on March 2, 2023, by the State Department of Water Resources (DWR). While this plan gives us a roadmap toward sustainability, the requirement date for sustainability is 2040, allowing a continued period of basin depletion.

The baseline water storage level chosen for the GSP is 2017, a point at which 141 wells were already recorded to have gone dry¹. An additional 95 wells were reported dry between January 2018 and 2022. The GSP identified the historical average annual groundwater storage loss of 12,600 acre-feet per year (AFY)², which has resulted in an increasing number of dry wells³. The GSP identifies some new sources of water, but far less than the 12,600 AFY of overdraft experienced during the time frame 1981-2011. Therefore, the only way to fully achieve sustainably is to use less water.

¹ Technical Memorandum – Paso Robles Basin Well Impacts Analysis using data from the DWR Household Water Supply Shortage Reporting System, GSI Water Solutions Inc., dated May 11, 2022

² Acre-Foot of water is equal to 326,000 gallons

³ Paso Robles Subbasin Groundwater Sustainability Plan (GSP) Page 6-14

Agricultural irrigation is about 90 percent of the Paso Basin water use, so any sustainable plan primarily requires less water use by growers. This is challenging since grapes, our largest crop in the basin and a key part of the economy, are already a good agricultural choice requiring less water per acre than most crops. Ultimately, the problem is a result of too much acreage in production. The GSP presents the concept of a fallowing program to reduce acreage.

The implementation of the GSP is behind schedule and is currently lacking details for how to implement the plan. Without faster progress toward a sustainable basin, more rural resident wells will continue to go dry and water quality could deteriorate.

Abbreviations and Acronyms	
AF	Acre-Feet
AFY	Acre-Feet Per Year
CCRWQCB	Central Coast Regional Water Quality Control Board
City	City of Paso Robles
CSA	County Service Area
CSD	Community Services District
County	County of San Luis Obispo
County DGS	San Luis Obispo County Department of Groundwater Sustainability
DWR	California State Department of Water Resources
ET	Evapotranspiration
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GSI	GSI Water Solutions Inc. (consultant)
HWS	DWR Household Water Supply Shortage Reporting System
JPA	Joint Powers Authority
LAFCO	Local Agency Formation Commission
MILR	Multi-Benefit Irrigated Lands Repurposing (fallowing program)
MOA	Memorandum of Agreement
NRCS	National Resources Conservation Service
Paso Basin	Paso Robles Area Subbasin
PBCC	Paso Basin Cooperative Committee
SGMA	Sustainable Groundwater Management Act
State	State of California
SWP	State Water Project
UC Extension	University of California Davis Extension

INTRODUCTION/PURPOSE

In drier and drought-prone areas of California, access to water has historically been an area of concern. Over the years, despite some outside supplementation of water, agricultural demands and the growing population have dramatically reduced many of California's groundwater supplies. In response to the need for long-term access to water, in 2014 the State enacted the SGMA to help protect groundwater resources. This act prioritized basins of concern and required the Paso Basin to create a GSP. The Grand Jury wanted to review the Paso Basin GSP to ensure it is on track to create a sustainable groundwater basin. Further, with 236 rural residential wells having gone dry in the period of 2013 to 2022, would the GSP implementation be robust and timely enough to protect users of the basin from further dry wells?¹

ORIGIN

The 2022-23 Grand Jury started their term during the summer of 2022, when portions of our county were in critical drought conditions. Because water supply sustainability is a topic of widespread interest, the Grand Jury initiated a review of the Paso Basin GSP to determine whether the GSP is on track to provide sustainable groundwater for future generations. Record rains at the beginning of 2023 have increased reserves and perhaps reduced public concern. Yet the Grand Jury's initial review of the GSP and Annual Reports showed a need to complete the process of investigation and bring a report forward for public awareness and swifter action toward Paso Basin groundwater sustainability.

METHODS/PROCEDURE

The Grand Jury conducted its investigation of the Paso Basin GSP through review of the plan itself, the 2017-2022 Paso Basin Annual Reports, and consultant reports; interviews with GSA board members and their staff, consultants, and agricultural experts; attendance at meetings of the Paso Basin Cooperative Committee; and public records requests for County wells and budget data.

NARRATIVE

Over the past 40 years, the Paso Robles area has seen dramatic changes in agricultural practices as well as persistently dry hydrologic cycles that have negatively affected the underlying Paso Basin. Since 1998, approximately 700,000 acre-feet have been depleted from storage within the Paso Basin⁴. This critical water resource supports over \$1.082 billion⁵ in agricultural production annually and is a key asset for regional tourism.

The Paso Basin lies entirely within San Luis Obispo County. The basin includes the City of Paso Robles and unincorporated areas of the County including Shandon, Creston, San Miguel, Cholame, and Whitley Gardens. In 2022, approximately 92 percent of groundwater extracted from the Paso Basin was for agricultural use.⁶

California groundwater had no formal regulations and was based on beneficial use as determined from court rulings under water appropriations and property rights until 2014, when the State of California enacted the SGMA to help protect groundwater resources. The act requires formation of local Groundwater Sustainability Agencies (GSAs) in high- and medium-priority basins to develop and implement GSPs. The objective of GSPs is to provide a roadmap for how groundwater basins will reach long-term sustainability by 2040. Sustainable yield is defined by SGMA as “the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin that can be withdrawn annually from a groundwater basin without causing an undesirable result.”⁷

The Paso Basin was determined to be a high priority basin according to the DWR in 2018. Accordingly, a GSP has been jointly developed by four GSAs under a Memorandum of Agreement (MOA):

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

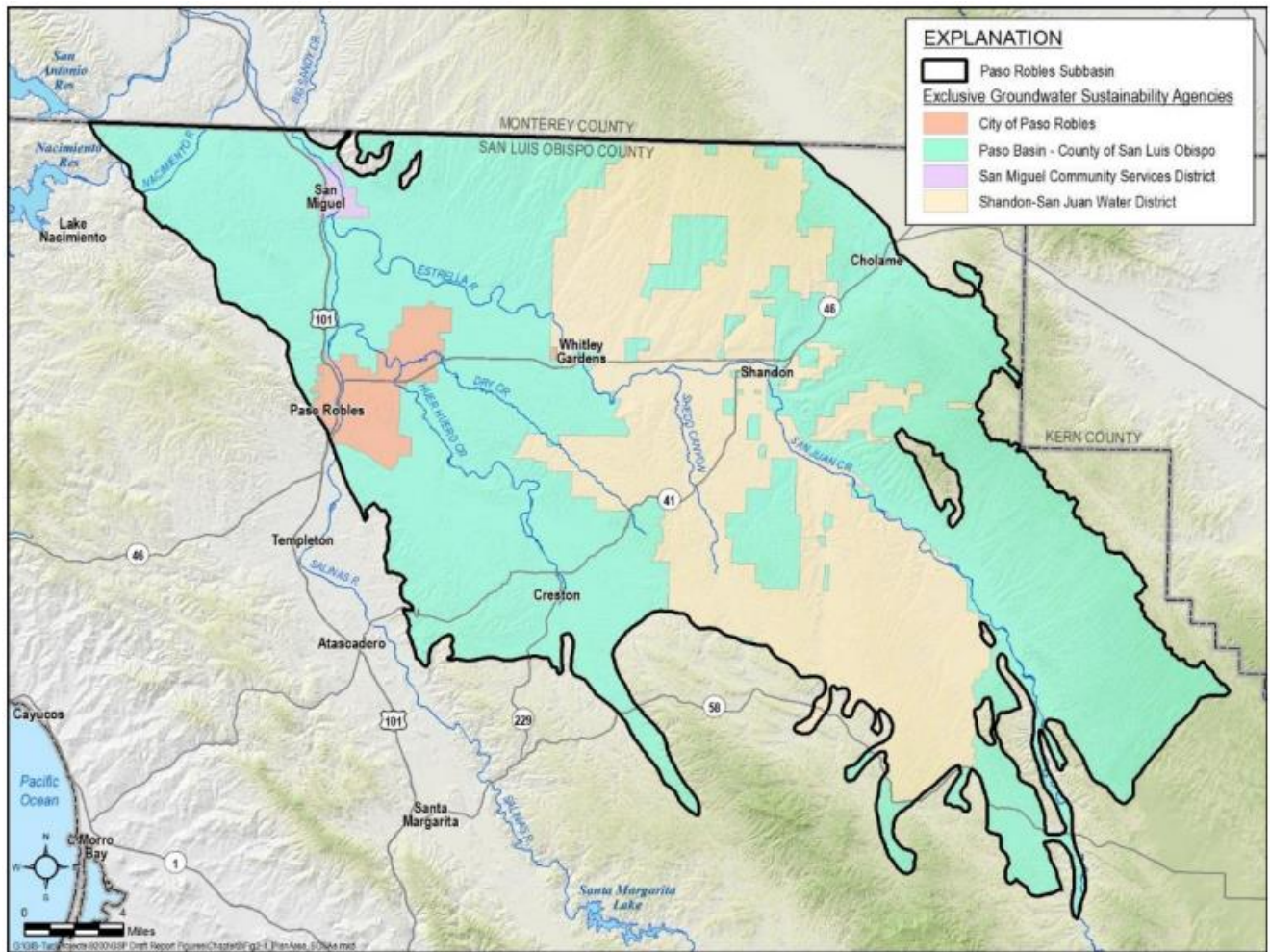
⁴ Paso Robles Subbasin Water Year 2022 Annual Report, Figure 12

⁵ 2021 Annual Crop Report, County of San Luis Obispo Department of Agriculture/Weights and Measures, Page 6

⁶ Paso Robles Subbasin Water Year 2022 Annual Report, Page 31

⁷ Paso Robles Subbasin Groundwater Sustainability Plan, Page 6-1

Figure 1 – Paso Basin Boundary and GSAs⁸



The Paso Basin GSP was recently approved by the DWR on March 2, 2023. Since 2017, the Paso Basin GSAs have produced joint annual reports. The annual reports serve as technical updates to the GSP and are required to be submitted to the State by April 1 of each year following GSP adoption.

The Water Year 2020, 2021, and 2022 Annual Reports show worsening groundwater conditions in the Basin⁹. Groundwater extraction has exceeded the historical Paso Basin Sustainable Yield due to increased pumping and a three-year dry hydrologic cycle. Groundwater storage decreased by 239,400 acre-feet over the three-year period.¹⁰ Of particular concern are the

⁸ Source: Figure 2-1 Paso Basin GSP page 2-6

⁹ Water Year begins October 1 and ends September 30 of the next year as defined under the GSP

¹⁰ Paso Robles Subbasin Water Year 2022 Annual Report, Page 17

rural communities that rely solely on groundwater for their water supply. Several wells have either gone dry or seen a reduction in water pressure.

On the positive side, an initial round of grants totaling \$7.6 million have been awarded to the GSAs by DWR Sustainable Groundwater Management Grant Program. The grants funded numerous GSP implementation items, including supplemental water projects and studies, addressing GSP data gaps, grant administration, and implementing high priority management actions. Additional grants have been awarded and are anticipated for recycled water projects to offset basin pumping.

The 2022 Draft Annual Report states in its Summary of Impacts of Projects and Management Action, “Additional time will be necessary to judge the effectiveness and quantitative impacts of the projects and management actions either now underway or in the planning and implementation stage. However, it is clear that the actions in place and as described in this Water Year 2022 Annual Report are a good start towards reaching the sustainability goals laid out in the GSP.”¹¹

BASIN DESCRIPTION

In 2018, Paso Basin boundaries¹² were modified by DWR to exclude the Upper Nacimiento River Valley below the Nacimiento Dam, and the basin was classified as a high priority basin. There are two principal aquifers within the Paso Basin: the shallower Alluvial Aquifer and the deeper Paso Robles Formation Aquifer (Paso Aquifer). An aquifer is defined as an underground layer of water bearing permeable rock or unconsolidated material from which freshwater can be brought to the surface by pumping. Groundwater is currently pumped from both aquifers. Historical reduction in groundwater storage has occurred in the Paso Aquifer.

The Paso Basin is a northwest trending, sediment-filled valley bounded on the east by the Temblor Range and San Andreas Fault, on the west by the Santa Lucia Range and San Marcos Rinconada fault, and on the south by the La Panza Range. The Atascadero Sub-basin is separated

¹¹ Paso Robles Subbasin Water Year 2022 Annual Report, Page 54

¹² DWR Bulletin No. 118; Basin No 3-004.06

from the Paso Basin by the San Marcos Rinconada fault. The northern Basin boundary is the Monterey County line, with water-bearing sediment connection to the Upper Salinas River Basin.

The prevalent sediment within the Paso Basin is the Paso Aquifer. The sediment thickness is commonly 700 to 1,200 feet. However, this formation has sedimentary layers up to 3,000 feet thick in the northern part of the Estrella area and up to 2,000 feet near Shandon. The sand and gravel zones throughout the Paso Aquifer are much thinner and discontinuous. The Alluvial Aquifer is present under the flood plains for local rivers and streams. These deposits are typically no more than 100 feet deep and are comprised of coarse sands and gravels.

EXISTING WELLS IN THE BASIN

San Luis Obispo County Department of Public Health has record of 5,164 wells in the Paso Basin, most of which are for domestic use, permitted between 1965 and 2022.¹³ Of the permitted wells approximately 600 are agricultural (production) wells. Many of the wells have been abandoned and are duplicated in the database. As a result, the exact number of wells in the Paso Basin is unknown.

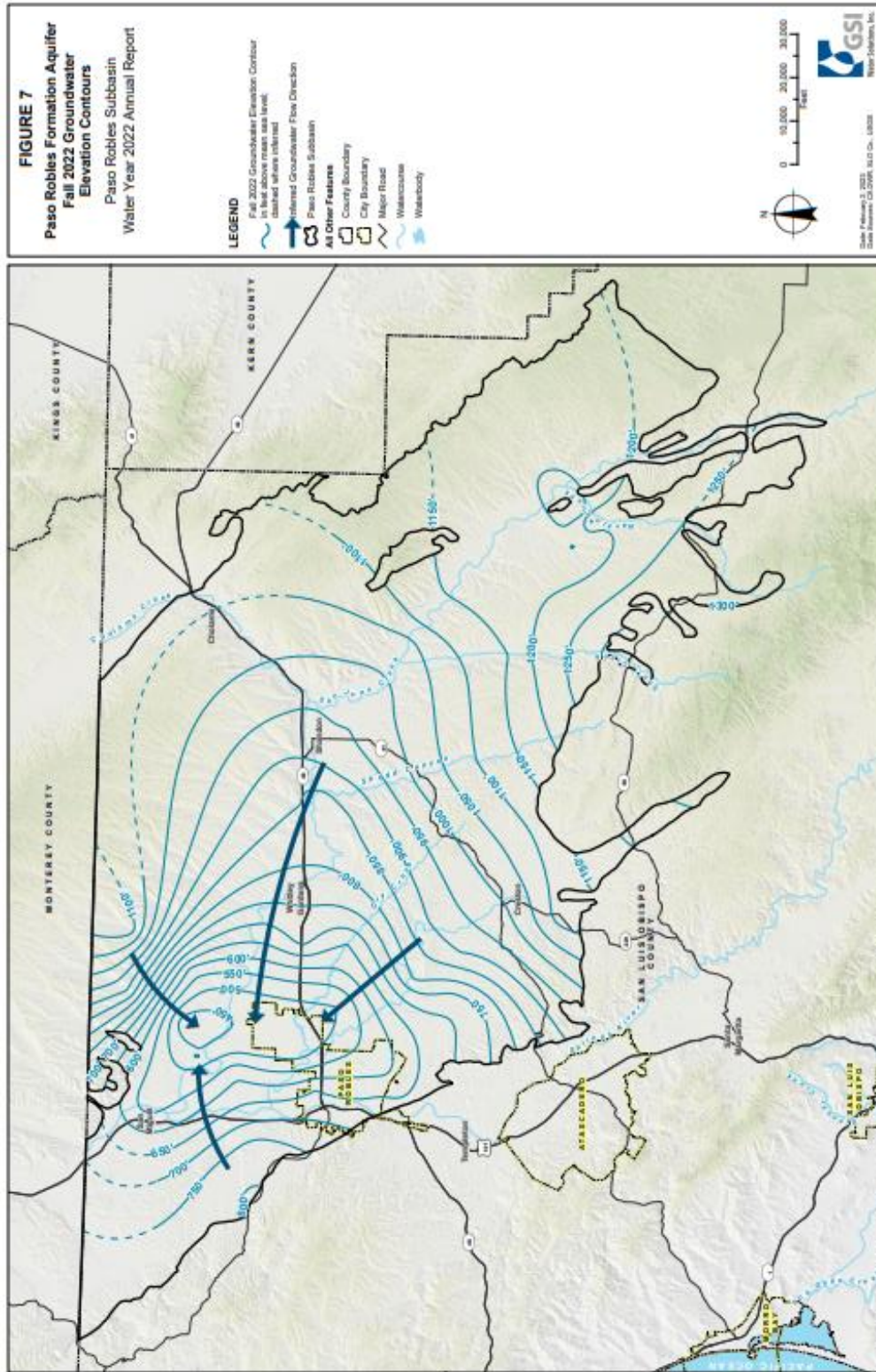
GROUNDWATER MONITORING METHODS

The GSP utilizes groundwater levels to determine changes in groundwater storage within the Paso Basin. Currently, there are 23 wells in the groundwater elevation monitoring network: 22 wells are in the Paso Aquifer, and one well is in the Alluvial Aquifer.¹⁴ There are approximately 90 confidential wells in the Paso Basin that have been monitored since 2012, which could be used to fill some of these data gaps if the well owners agree to sign amended confidentiality agreements.¹² The submittal of well data by private owners to the GSAs is currently voluntary. Groundwater gradients trend toward the northwest, with depressions near the City of Paso Robles and the community of San Miguel. In general, groundwater in the western side of the basin flows toward the lower groundwater elevations.

¹³ Paso Robles Subbasin Groundwater Sustainability Plan, Page 3-13

¹⁴ Paso Robles Subbasin Water Year 2022 Annual Report, Page 25

Figure 2 – Groundwater Elevations as of Fall 2022¹⁵



¹⁵ Source: Figure 7; 2022 Paso Basin Annual Report page 64

Due to the lack of actual groundwater elevation data, the amount of agricultural groundwater extraction reported in the 2022 Paso Basin Annual Report was estimated using two modeling tools. They are as follows:

1. The soil-water balance model, which was developed for the Paso Robles Groundwater Basin Model Update¹⁶, utilizes crop type information, weather and evapotranspiration data, as well soil water holding capacity to estimate agricultural water demand in the Basin. Evapotranspiration (ET) is the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants.
2. The satellite-based model uses specific land use data from LandIQ, in conjunction with the OpenET ensemble model. LandIQ is used to set the land use types, while OpenET is used to measure the actual amount of water that is transferred to the atmosphere by evapotranspiration. Together, the two modeling tools provide an estimate of pumped groundwater within the Paso Basin.¹⁷

In the 2022 Annual Report, the estimates of groundwater extraction were nearly identical when comparing results between the two models. Since the satellite-based model is considered to have a higher level of accuracy, the results were used in the Annual Report.

DRY WELL ANALYSIS

On May 11, 2022, the hydrology consulting firm GSI Water Solutions (GSI) published an analysis which evaluated the incidences of dry wells in the Paso Basin. The data for the analysis came from DWR Household Water Supply Shortage Reporting System (HWS). The study looked at clusters of domestic wells that have gone dry as reported by the HSW. It did not look at agricultural wells.

There have been 236 dry wells reported to HWS since 2013. Of these, 141 wells were reported between 2013 and the end of 2017. An additional 95 wells were reported dry between

¹⁶ Paso Robles Basin Groundwater Basin Model Update, December 19, 2014, Geoscience Support Services, Inc

¹⁷ Paso Robles Subbasin Water Year 2022 Annual Report, Pages 31-33

January 2018 and 2022. The largest number of dry wells occurred in 2017, which was at the end of a period of drought.

The dry wells were grouped into clusters by geographic area. They then analyzed the groundwater elevation for each of the cluster areas. This showed the rate at which the water level of the wells was dropping each year. In all areas, water levels dropped.

Table 1 – Domestic Dry Wells

RURAL DOMESTIC DRY WELLS¹⁸		
Area	Number of Dry Wells 2013-2017 Pre-SGMA	Number of Dry Wells 2018-2022 Post-SGMA
Paso Airport Area	82	61
Pomar Area SE of Templeton	34	11
Linne Road Area	12	4
Outlying Areas	13	19
Total	141	95

The largest number of dry wells was in the Airport area. The greatest decline in water level was in the area around Western Pomar Junction, which had a drop in wells averaging 6 feet per year. The Western Pomar Junction had the second highest number of dry wells.

The neighborhoods around the Western Airport are not part of the City of Paso Robles water system. Therefore, most of the homes in the area have private wells. Based on the HWS permit database most of them were drilled to 100-200 feet in depth. When a well goes dry, it causes considerable problems for the homeowners. The resale value of a property is greatly reduced if the well for that property has gone dry. Some homeowners are forced to order private water deliveries. In many cases the wells must be re-drilled to a greater depth. Most of these neighborhoods are in low-income areas and many of the homeowners cannot afford to have their wells re-drilled.

¹⁸ Extracted from GSI May 11, 2022, Technical Memorandum: Paso Robles Basin Well Impacts Analysis using data from the DWR Household Water Supply Shortage Reporting System

The GSI report suggests that well completion reports could be digitized and precisely located by the San Luis Obispo County Environmental Health Services to create a well dataset that could be used to predict where future dry wells could occur based on water level monitoring data. This would allow the County to perform outreach to those households that are at risk of having their well go dry.

LAND SUBSIDENCE

Land subsidence is the lowering of the land surface. It occurs when water underneath the ground is pumped away and the land above it collapses. Subsidence can be estimated using Interferometric Synthetic Aperture Radar. This was done for the Paso Basin, and the data showed that subsidence of up to 0.025 feet (0.3 inches) may have occurred; 1.2 inches is within the noise of the data and is equivalent to no subsidence at all. Subsidence of up to 0.25 feet (3 inches) may have occurred in a few isolated locations between June 2015 and 2020. The GSA will continue to monitor and report on annual subsidence, but the indication is that this is not much of a problem in the basin.

GROUNDWATER QUALITY

Water quality is not a primary focus of SGMA. The groundwater found in the basin is generally suitable for both drinking and agricultural service. Eight Constituents of Concern were identified and reviewed in earlier studies. These are salinity, chlorides, nitrates, sulfates, boron, dissolved solids, sodium, and gross alpha radioactivity. Overall, there have been no significant changes to groundwater quality since 2016. As the water table is lowered, it is possible that concentrations of these chemicals could increase to unsafe levels, and they will continue to be monitored.

HISTORICAL CROP PATTERNS

During the early- to mid-1990s, groundwater pumping decreased in the Paso Basin as high-water-use crops (alfalfa and pasture) were replaced by vineyards, fruits and nuts. Irrigation demand for vines is lower than alfalfa and pasture. However, since late 1998, increased groundwater

pumping has resulted in over 700,000 AF of lost groundwater storage. The groundwater pumping increase is due to continued expansion of irrigated acreage within the basin.

The following table shows a summary of crop patterns and valuation of the respective crops within the County:

Table 2 – Historic Agricultural Production

San Luis Obispo County¹⁹				
Acres in Production				
	Field Crops	Fruit & Nut	Vegetable	Wine Grapes
1980	198,000	15,000	22,000	4,374
1990	1,100,000	18,000	33,000	8,327
2000	1,100,000	36,000	36,000	24,600
2010	1,063,000	13,800	31,000	36,253
2020	1,100,000	58,000	28,000	46,600

San Luis Obispo County				
Total Crop Value				
	Field Crops	Fruit & Nut	Vegetable	Wine Grapes
1980	\$ 24,000,000	\$ 18,000,000	\$ 84,000,000	\$ 10,000,000
1990	\$ 18,000,000	\$ 56,000,000	\$ 136,000,000	\$ 34,000,000
2000	\$ 16,000,000	\$ 122,000,000	\$ 136,000,000	\$ 84,000,000
2010	\$ 18,545,000	\$ 192,000,000	\$ 176,666,000	\$ 173,558,000
2020	\$ 15,000,000	\$ 432,000,000	\$ 233,000,000	\$ 282,000,000

Crop patterns within the County have changed significantly in the past 40 years. Prior to 1990, the main crops within the County were field crops and vegetables. Field crops are dependent on winter rainfall and not supplemental irrigation. In 2020, the highest valued crops within the County were wine grapes, fruits and nuts. **Since 1980, the acreage of wine grapes in production has increased more than ten-fold (46,400 acres in 2020, versus 4,374 acres in 1980).** Also,

¹⁹ 1980-2021 Annual Crop Report County of San Luis Obispo Department of Agriculture/Weights and Measures

since 1980, the valuation of wine grapes within the County has gone up 280 percent. As of 2022, wine grapes accounted for 36,872 acres within the Paso Basin with a valuation of \$223 million.²⁰

BASIN WATER SUPPLY DESCRIPTION

Current surface water supplies available within the Paso Basin include 6,500 AFY of Lake Nacimiento entitlement, an average of 3,300 AFY for the last five years of Salinas River Underflow,²¹ and 100 AFY of State Water Project (SWP) water for Shandon community water supply.²² Groundwater pumping is used as the primary source to meet water supply requirements within the Basin.

2022 BASIN WATER USE

In 2022, 4,250 AF of surface water was used within the Basin. The imported water included 901 AF of Nacimiento Water Project and 3,349 AF of Salinas River Underflow, which is classified as surface water. The total amount of these water allocations is not always available and has not been used by the community in all years. No SWP water was used within the basin during 2022²³.

In 2022, 87,200 AF of groundwater was used within the Paso Basin. Agricultural use was 92 percent of groundwater extraction, accounting for 80,200 AF. The other eight percent (7,042 AF) was used by municipal, rural domestic, and small public water systems.²⁴

GSP HISTORIC, PRESENT, AND FUTURE WATER BUDGET FOR THE BASIN

SGMA regulations require that the GSP should include an assessment of the groundwater conditions within the Basin for historical, current, and future water budgets. Current data for groundwater changes was based on the period 2012-2016. The historical water budget included data for the period 1981-2011. The future water budget was evaluated for the GSP implementation period from 2020-2040.

²⁰ San Luis Obispo County Agricultural Commissioner Letter to the 2022-23 Grand Jury Dated February 21, 2023

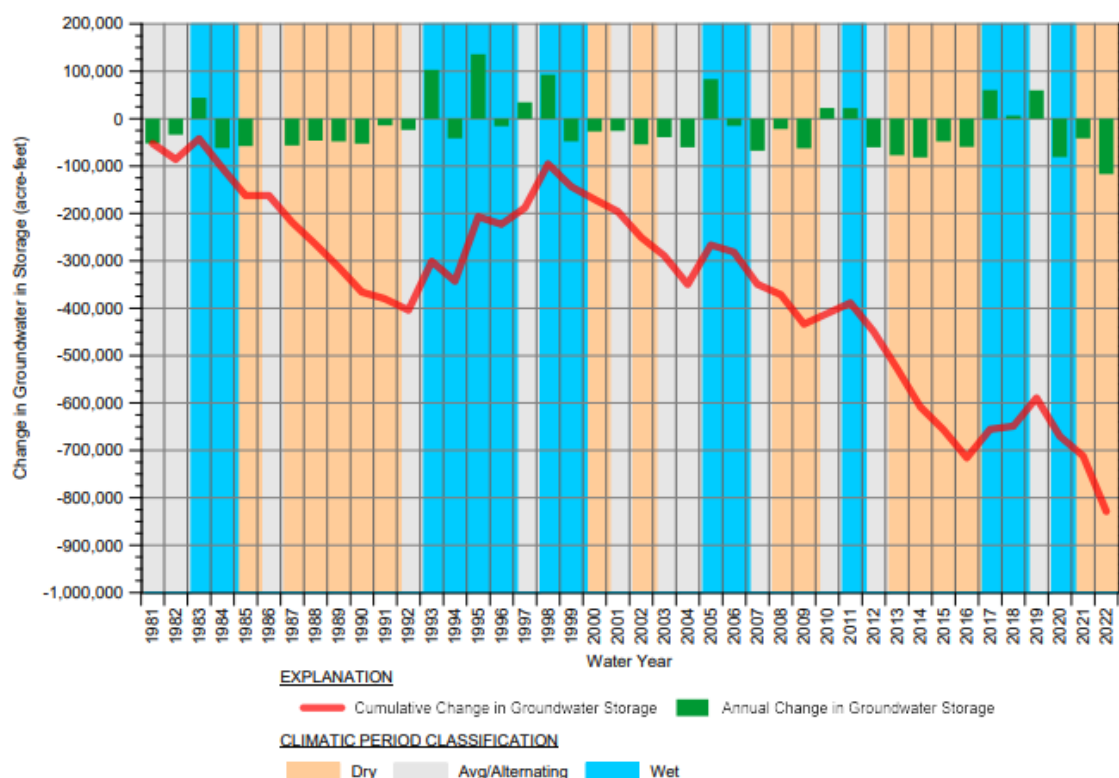
²¹ The City of Paso Robles produces Salinas River underflow, regulated as surface water by the State Water Resources Control Board, from wells located in Atascadero Subbasin

²² Paso Robles Subbasin Water Year 2022 Annual Report, Pages 37-38

²³ Paso Robles Subbasin Water Year 2022 Annual Report, Page 39

²⁴ Paso Robles Subbasin Water Year 2022 Annual Report, Page 36

Figure 3 – Cumulative Change Groundwater in Storage²⁵



During the historical water budget period, the average annual groundwater inflow was 71,400 AFY. Inflow is strongly influenced by hydrology. For the same period, average annual groundwater outflow was 84,000 AFY. The largest groundwater outflow component is groundwater pumping at an average of 72,400 AFY, or 90 percent of water used within the basin. The historical water budget sustainable yield estimate for the basin was estimated to be 59,800 AFY. Over the 31-year historical period, the net loss of groundwater was approximately 390,000 AF. Accordingly, there was an annual average groundwater storage loss of 12,600 AF.²⁶

During the current water budget period, drought conditions reduced the average annual groundwater inflow to 28,900 AFY. Average annual groundwater outflow was 94,300 AFY. The largest groundwater outflow component was groundwater pumping, at an average of 85,800 AFY or 90 percent of water used within the basin. The current water budget sustainable yield estimate for the basin was about 20,400 AFY, which reflected the drought conditions. During the current

²⁵ Source: Figure 12; 2022 Paso Basin Annual Report page 69

²⁶ Paso Robles Subbasin Groundwater Sustainability Report, Pages 6-9 to 6-14

period, the net loss of groundwater was approximately 327,000 AF. As a result, there was an average annual groundwater storage loss of 65,400 AFY.²⁷

For the future water budget period, the average annual groundwater inflow was estimated to be 69,500 AFY. Average annual groundwater outflow was calculated to be 83,200 AFY. The largest groundwater outflow component was groundwater pumping at an average of 74,800 AFY, or 90 percent of water used within the basin. The future water budget sustainable yield estimate for the basin was about 61,100 AFY. There is projected to be a 13,700 AFY average groundwater storage deficit for the future groundwater budget, assuming historic inflow.²⁸

Table 3 – Groundwater Water Budget

GSP Groundwater Assessment²⁹			
	Historical 1981-2011	Current 2012-2016	Future estimate 2017-2040
Average Inflow	71,400 AFY	28,900 AFY	69,500 AFY
Average Outflow	84,000 AFY	94,300 AFY	83,200 AFY
Average Annual Overdraft Deficit	-12,600 AFY	-65,400 AFY	-13,700 AFY
Net Loss Groundwater Storage	-390,000 AF over 31 years	-327,000 AF over 5 years	-274,000 AF over 20 years
Sustainable Yield	59,800 AFY	20,400 AFY	61,100 AFY
Groundwater Pumping Component	72,400 AFY (90% basin use)	85,800 AFY (90% basin use)	74,800 AFY (90% basin use)

GSP ACTION PLAN

The GSP outlines the approach to achieve a sustainable groundwater resource free of undesirable results within 20 years, while maintaining the unique cultural, community, and business aspects of the basin. The express goal of the GSAs is to balance the needs of all groundwater users in the Paso Basin, within the sustainable limits of the basin’s resources. The GSP develops quantifiable management objectives that consider the interests of the basin’s

²⁷ Paso Robles Subbasin Groundwater Sustainability Report, Pages 6-15 to 6-25

²⁸ Paso Robles Subbasin Groundwater Sustainability Report, Pages 6-25 to 6-31

²⁹ Paso Robles Subbasin Groundwater Sustainability Report, Page ES-6

beneficial groundwater uses and users, identifying management actions and conceptual projects that will allow the Paso Basin to achieve sustainability by 2040.

The GSP established Sustainable Management Criteria to measure groundwater sustainability in the Paso Basin. The criteria include minimum thresholds, measurable objectives, and undesirable results. The baseline for groundwater levels was set at the average 2017 well readings. The GSP approved by DWR sets the minimum threshold and the measurable objective was determined to be no long-term change in groundwater storage in the Basin. The undesirable limit was set at 30 feet below 2017 benchmark.

The 2022 Annual Report stated that several of the Paso Aquifer monitoring wells, within the groundwater monitoring network, are continuing to trend downward. Three wells have exhibited groundwater elevations below the minimum threshold established in the GSP.³⁰ Accordingly, the GSAs initiated an investigation to determine if local or basin-wide actions are required to address the undesirable result. The findings will be included in future Annual Reports.

As the GSAs embark on the implementation phase, the agencies need to fulfill the “Actions to Attain Sustainability” in the GSP. These include:

- Establishing a methodology for determining baseline pumping in specific areas,
- Establishing a methodology to determine whose use must be limited and by how much, including the use of supplemental water supply or actions taken by individual pumpers,
- A timeline for limitations on pumping in specific areas,
- Approving a formal regulation to enact the program.

These actions include public outreach and monitoring, promoting best management practices for water use, implementing water supply enhancement projects, and voluntary land fallowing program. The GSAs will establish regulatory conditions for pumping limitations if the groundwater levels continue to decline. Mandatory pumping limitations will depend upon effectiveness of voluntary actions and water enhancement projects.

³⁰ The Paso Robles Subbasin Water Year 2022 Annual Report, page 29

The GSAs have initiated several management actions to avoid and/or mitigate the decline in groundwater storage, which include:

- Enhanced data including expansion of monitoring wells for basin model,
- Satellite imagery to determine water usage more accurately,
- City of Paso Robles Recycled Water Program (up to 2,200 AFY),
- San Miguel CSD Recycled Water Program (200 – 450 AFY),
- City of Paso Robles Blended Nacimiento Water Program (directed groundwater enhancement),
- Expansion of Salinas Dam,³¹
- Increase in well data from private owners,
- Land fallowing pilot program known as the Multi-Benefit Irrigated Land Repurposing (MILR) Program.

CONSERVATION MEASURES

Water conservation is a key measure to mitigate pumping demand on the basin. The County Farm Advisor Office partners with University of California Davis Extension (UC Extension) outreach which provides extensive water conservation knowledge and practical experience with growers. Of note, the operations of vineyards are generally highly managed such that there is not excessive use of water, the exception being frost prevention systems reliant on irrigation. As noted by UC Extension, some benefits could be realized through growers switching to wind machines; however, that is still being researched and is dependent on specific geographical conditions within the basin. Field crops would be a more likely target for water conservation measures, and one agency representative expressed the need to reduce crop production during peak summer months to relieve pumping demand during the critical period for the basin.

The GSAs are in the process of identifying industry-wide Best Management Practices for water use that can be effectively communicated to water users within the basin. Best Management Practices that are being considered include state-of-the-art irrigation practices, accurate accounting

³¹ Ownership transfer from federal to state jurisdiction and required dam retrofit and expansion to meet State dam safety requirement makes this action distant to unlikely.

of precipitation and its contribution to soil moisture, delaying irrigation until soil moisture levels need replenishment, monitoring water use with soil and plant monitoring devices tied to ET estimates, and conversion of high-water demand crops to low water demand crops.

SUPPLEMENTAL WATER OPTIONS

While the GSP indicates a number of supplemental water projects, the magnitude of water supply is limited. Solutions are meant to be targeted to specific depressions or users within the basin. The cumulative effect of these projects, while worthwhile, will fall short of the annual pumping deficit that the basin continues to experience due to agricultural demands. Progress on the supplemental options is shown in the following table.

Table 4 – Proposed Supplemental Water Projects

Project	Lead Agency	Purpose	Timeline	Funding	Potential Acre Feet Annually
Paso Robles Recycled Water	Paso Robles	Direct reused water to Airport Area	Construction scheduled for Fall 2023	\$3.5 million WQCB; \$ 9.73 m in Federal	3000
San Miguel Recycled Water	San Miguel CSD	Direct recycled water to injection Salinas River	In development	\$1million secured for design	200
Nacimiento Water Blending with Recycled Water	Paso Robles	Supplemental recycled water with water to reduce salts	In discussion with growers who would use and pay for water	Unknown	1000
Nacimiento Water injection into Salinas/Estrella Confluence	TBD	Supplement depression in basin	No set partners; availability of water buyers/sellers unknown	Unknown	2800
Nacimiento Water delivered east of City of Paso Robles	TBD	Supplement growers, rural residential or depressions in basin	No set partners; availability of water buyers/sellers unknown	Unknown	2000
Salinas Dam Expansion	County	Install gate in dam to increase water impounded	Requires action at federal level to move to local asset	Unknown	1000

PASO BASIN GOVERNANCE

To develop, oversee, and fund a common GSP, governmental entities with water interests in the basin banded together under a Memorandum of Agreement (MOA). On September 20, 2017, the MOA was entered into by the County, San Miguel CSD, City of Paso Robles, Heritage Ranch CSD, and the Shandon-San Juan Water District. The MOA included a provision for Estrella El Pomar Creston Water District to become a member of the GSP if they were to form no later than June 30, 2017. The water district was not established until December 8, 2017. The original MOA included the intent for all agencies to develop a common GSP for the basin. Moreover, it specified cost sharing and governing board voting parameters under a “Paso Basin Cooperative Committee” (PBCC) body which would meet at least quarterly.

The MOA was intended to sunset after the GSP was accepted for submission by DWR. Subsequently, the MOA was amended by the parties on March 30, 2020, to remove that sunset clause. Heritage Ranch CSD requested removal on January 18, 2019, as DWR had approved their request to modify the basin boundary excluding the agency from the basin. At the time of this writing, the Estrella-El Pomar-Creston Water District (EPCWD) is being processed for inclusion as a GSA. Appendix A provides a map including EPCWD.

Table 5 – GSA Agencies

GSA Agency	Type of User	Voting Share under MOA ³²	Voting Share if EPCWD included ²⁸
San Luis Obispo County	Municipal CSA 16 Rural Residential Ag Production	62%	33%
Shandon-San Juan Water District (SSJWD) ³³	Ag Production	20%	20%
City of Paso Robles	Municipal	15%	15%
San Miguel CSD (SMCSD)	Municipal	3%	3%
Estrella-El Pomar-Creston Water District (EPCWD) ²⁹	Ag Production	—	29%

³² Defined under the Adopted Memorandum of Agreement

³³ Water District formed under California Water Code 34000

The MOA was focused on the initial phase of GSP development and outreach. As a result, there are no specific provisions for implementation of the GSP. Under the submitted GSP, it is stated the agencies must decide whether to continue working in a coordinated fashion with an updated version of the MOA to detail implementation requirements or to seek development of a Joint Powers Authority (JPA). A JPA would require processing through Local Agency Formation Commission (LAFCO). The implementation phase of the GSP will require coordination of the individual GSAs in adopting common programs and regulations to govern the basin on an equal footing. An MOA process would not provide for adopting one common regulation or program, as there is no collective governing authority in that document.

To implement the GSP, the governing boards will need to set up the following programs:

1. Establish an ordinance for setting pumping extractions reporting within the basin based on estimates or actual pumping records on a per parcel basis;
2. Establish an ordinance setting pumping limit levels and penalties for regulation of future pumping;
3. Establish a land fallowing program, either through voluntary means or mandate as warranted; and
4. Establish an ordinance setting extraction fees based on some type of parcel or pumping volume basis across the basin which are equitable.

Both the City of Paso Robles and San Miguel CSD, as municipal water purveyors, have wells that are continually monitored and reported. Their ratepayers are financially contributing to solutions and adhering to water conservation programs which are established either locally or under a state mandate. The focus needs to be on water practices within the unincorporated lands and water districts.

Initially, the City of Paso Robles led the effort to hire and oversee professional consultants to develop the GSP. This responsibility is now managed by the County's Department of Groundwater Sustainability (County DGS), which was created by the Board of Supervisors in 2021. While the County DGS is small, it has a defined objective to address these critical groundwater basins such

as Paso Basin. In addition to a requirement for submitting an Annual Report to DWR, the GSAs will also need to fund and submit a five-year update to the GSP in 2025.

GSAs are a new type of governing structure over a common resource. It is essential for the governing board to build public trust through public outreach and development of regulations and programs that are viewed as fair by the wide range of groundwater users within the basin. The 2013 Paso Robles Basin Land Use Management ordinance was set to regulate continued water usage under a “water offset” requirement. The ordinance established five AFA maximum per parcel for those properties without historical agricultural use. This prevents parcels with no previous water usage above that level from initiating extensive agricultural uses. Moreover, the ordinance limits expansion of existing agricultural operations to occur only when it is shown there is no net water usage increase. That ordinance was created solely by the County Board of Supervisors under their land use powers within the unincorporated areas.

The GSAs collective will need to address what is fair for the various parcels within the basin. In the first quarter of 2023, the PBCC has established three technical committees to: 1) develop the voluntary land fallowing program, known as the Multi-Benefit Irrigated Land Repurpose (MILR) program; 2) expand the basin monitoring program; and 3) oversee development of the City of Paso Robles “Blended Water Project” involving recycled water from the City and available Nacimiento Lake water. The proposed MILR program will address the key elements of groundwater usage measurements, groundwater accounting/pumping restrictions, and groundwater usage fees. A description of the overall MILR program is included in Appendix B.

Time remains of the essence. Although continued outreach and engagement of stakeholders is necessary and ongoing, the PBCC will need to take immediate action. While programs may initially be developed as voluntary, the stakeholders need to be mindful that this may lead to necessary mandatory programs to achieve water balance for the basin. The fallowing plan needs to be substantial enough to allow for revision of the existing planting ordinance to allow for equitable use of properties.

PASO BASIN FUNDING

Under the MOA, the individual GSAs contribute to the costs of the GSP development and Annual Reports based on their prorated representation; the County is covering the majority of costs. Once SGMA was passed, DWR provided GSAs with funding for development of GSPs. For the Paso Basin, DWR awarded a grant of \$ 7.5 million, which the City of Paso Robles used to lead efforts to develop the basin GSP. Over the initial years of the GSAs, this grant funding has provided the revenues for most expenditures. The County has also budgeted General Funds in excess of \$3.5 million for the GSA formation and development over the past several years.

Under SGMA, GSAs are allowed to impose fees to cover administration, reporting, and monitoring costs. For the City of Paso Robles and the San Miguel CSD, ratepayers would provide the cost share for these entities. For the rural lands, fees can be imposed based on parcel size, pumping volumes, or some combination of the two. Both SSJWD and EEPCWD have established parcel fees for their basic operations. The County unincorporated lands, which lie outside the two water districts, currently have no fees imposed.

In addition to the initial grant from DWR, the basin has received other outside grant packages which are being directed to supplemental water projects. The City of Paso Robles has received \$3.5 million and \$9.73 million from the Central Coast Regional Water Quality Control Board (CCRWQCB) grant program and the 2021 Federal Infrastructure Bill, respectively. These funds would be used to install pipelines to distribute the City's recycled water to the east side of the City and make it accessible for agricultural parcels in the Airport area. The County is leading efforts to obtain additional grant funding for GSP implementation. Alternatively, under SGMA, GSAs may impose fees for capital improvements or other programs to address pumping demand. However, those fees may be challenged under State statutes by the property owners within the basin.

The County DGS has initiated steps to institute a tiered fee program, while creating a nexus study in support of a fee. The balance of grant funds has been used to reimburse the County General Fund in support of the GSP.

PUBLIC OUTREACH AND WEBSITES

During the development of the GSP, over 90 public hearing meetings were held between January 2017 and December 2020. The hearings were held by the individual GSAs and the Cooperative Committee. Since that time, public outreach has been focused on the quarterly Cooperative Committee meetings and the review of the Annual Report. The GSA are in the process of setting up at least three technical advisory committees, which should provide additional forums for public input. The work done on the GSP to date has created a wealth of data, studies, and comments. Many previous studies and committee meeting minutes are stored away in the County DGS website as well as the individual GSA websites. Given the prominence of the Paso Basin and number of stakeholders involved, developing one common website and information repository for implementation actions involving the GSP public meetings, comment periods, budgets, and proposed actions would be useful. Particularly for those rural residential interests which may not be involved in technical committees or the Annual Reports, there is a need for a “one stop shop” for specific location information, questions, and tools for residents to understand current conditions of the basin.

GSP IMPLEMENTATION DEADLINE

The adopted GSP contained the timeline (see Appendix C) for the various initiatives contained in the five-year plan. While the GSP approval is ahead of schedule, the implementation steps are not.

CONCLUSIONS

The Paso Basin was identified by the DWR as a high priority basin for the development of a GSP. The research for this GSP and Annual Reports show that, from 1998 through 2022, approximately 700,000 AF have been depleted from storage (Figure 3). To put this in context, this is the equivalent of more than 14 full Lake Lopez Reservoirs of water being lost from underground aquifers due to water extraction exceeding average annual recharge. We are fortunate, in 2023, to have a wet season in which the recharge will certainly exceed extraction, but this is an isolated year. Past precipitation records and future models predict that drier years will continue.

The approved GSP provides a road map toward sustainability. As legislated by SGMA, the GSP deadline for achieving sustainability is 2040. The GSP implementation is behind schedule. Given the history of 236 known rural residential dry wells from 2013 to 2022, the Paso Basin can ill afford a protracted implementation of the sustainability plan. New water sources will be helpful but are not enough to meet the projected water demand. Since over 90% of the water use is for agriculture, and most agricultural irrigation is managed efficiently, the primary solution will need to be reduced agricultural acreage. The GSP has planned a pilot fallowing program to reach this goal but details and deadlines for this program have not been put in place. Programs are needed to assure water supply equity and easy information access for rural residential users.

In addition to basin water sustainability, there is a need for financial sustainability. Grant funding has covered many projects for the sustainability plan which will reduce costs for rate payers. At this point, some areas of the Paso Basin have imposed fees while others still need to impose fees for equitable user support of the basin.

SYNOPSIS OF PASO BASIN DATA

- The Paso Basin is in decline and the water deficit continues as noted in the GSP and Annual Reports.
- Annual Basin overdraft is approximately 12,600 AFA based on historical data (1981-2011).
- The well monitoring network (water levels) data set is incomplete and does not provide information from some key areas.
- The dataset on agricultural user pumping volumes (extractions) is incomplete.
- Neither feasible supplemental water options nor conservation measures can balance the basin.
- Municipal groundwater agencies have Master Water Plans with conservation programs to regulate usage while the unincorporated lands and agricultural areas have none.
- Information on studies, datasets, meetings, and budgets are contained separately under each GSA.

- Outside Funding for GSP development and implementation includes:
 - \$ 7.5 million from DWR (GSP) development
 - \$ 4.5 million from Central Coast Regional Water Quality Control Board for recycled water
 - \$ 9.73 million from 2021 Federal Infrastructure bill
- Local Funding includes:
 - Parcel Fees under SSJWD and EPCWD
 - Ratepayers in City of Paso Robles, SMCSO
 - Over \$ 3.5 million in County General Funds
- 236 Rural Residential wells have run dry between 2013 and 2022.
- Use of rural properties, which did not have a historic water usage prior to 2013, remains restricted and has at present not been resolved by the County under their land use powers.
- The GSP Timeline included in the submitted GSP is behind schedule.

COMMENDATION

Commendation to local government and water boards for the substantial number of grants obtained toward management of the Paso Basin. The City of Paso Robles has made great strides toward implementing their recycled water project.

FINDINGS

- F1. The combination of drought conditions and increased agricultural lands in production has resulted in an unsustainable decline in the Paso Basin.
- F2. Since 1998 there has been over 700,000 AF reduction of groundwater storage resulting in dry wells for many rural residential properties and jeopardizing long-term agricultural viability.
- F3. The current number and location of groundwater monitoring well data collected by the PBCC is insufficient for decision making.

- F4. The PBCC currently does not require or have full access to the annual volume of groundwater pumping by all agricultural users to determine the extent of the demand on the basin.
- F5. The GSP initiatives for feasible supplemental water options and conservation measures are insufficient to balance the basin. Basin recovery depends upon reduction in active agricultural production pumping.
- F6. The failure of the PBCC to apply equitable pumping restrictions has resulted in continued decline of the Paso Basin.
- F7. Public information and outreach on Paso Basin status is inadequate.
- F8. Fees that would make the GSP self-sustaining are not uniformly applied across the GSAs. Unincorporated areas governed by the County are not collecting fees.
- F9. Rural residential wells remain at risk. Many rural residential users lack the resources and means to correct the situation.
- F10. There remains an inequity between rural properties in using groundwater for agricultural production under the 2013 County Planting Ordinance.
- F11. Management efforts have not advanced sufficiently to begin regulation of basin activities.

RECOMMENDATIONS

- R1. The GSAs need to expedite their plans to expand the monitoring network for use in the 2025 GSP update.
- R2. The GSAs need to employ the most accurate satellite data for determining groundwater utilization or adopt regulations which mandate reporting of groundwater extraction for agricultural production wells within the Paso Basin by the 2025 GSP update.
- R3. Implementation of the proposed MILR Program, to establish voluntary land fallowing, needs to be initiated by the 2025 GSP update. If voluntary measures are ineffective, the PBCC will need to implement a mandatory program.
- R4. The GSAs must establish and implement the necessary governance structure to build public trust and execute procedures up to and including formal regulations to define equitable groundwater extractions and enforcement mechanisms.

- R5. GSAs should intensify outreach to solicit public input and educate residents and property owners, particularly those whose wells have run dry. Outreach should include the development of a collective single website for the PBCC.
- R6. In consideration of equitable use of groundwater, the PBCC needs to develop a plan to set aside funds and an administrative mechanism to ensure that rural residential users have access to water.
- R7. By Fiscal Year 2024/25, the County GSA should impose user fees to eliminate the need for County General Fund contributions and to implement the necessary programs for basin sustainability.
- R8. Once the GSAs have enacted management measures which ensure the basin is stabilized, the County Board of Supervisors should revise their existing planting ordinance to allow for equitable agricultural use of properties.
- R9. For the 2025 GSP annual update, the Cooperative Committee should update the GSP timeline to show a realistic and deliverable set of management actions.

REQUIRED RESPONSES

The Paso Basin Cooperative Committee is required to respond to: R1 – R5 and R9.

The San Luis Obispo County Board of Supervisors is required to respond to: R6 – R8.

The Shandon – San Juan Water District is required to respond to: R6.

All responses shall be submitted to the Presiding Judge of the San Luis Obispo County Superior Court as follows:

Responses from the San Luis Obispo County Board of Supervisors are due within 60 days of submission of the report.

Responses from the Paso Basin Cooperative Committee and the Shandon – San Juan Water District are due within 90 days of submission of the report.

A paper copy and an electronic version of all responses shall be provided to the Grand Jury.

933.05. Findings and Recommendations

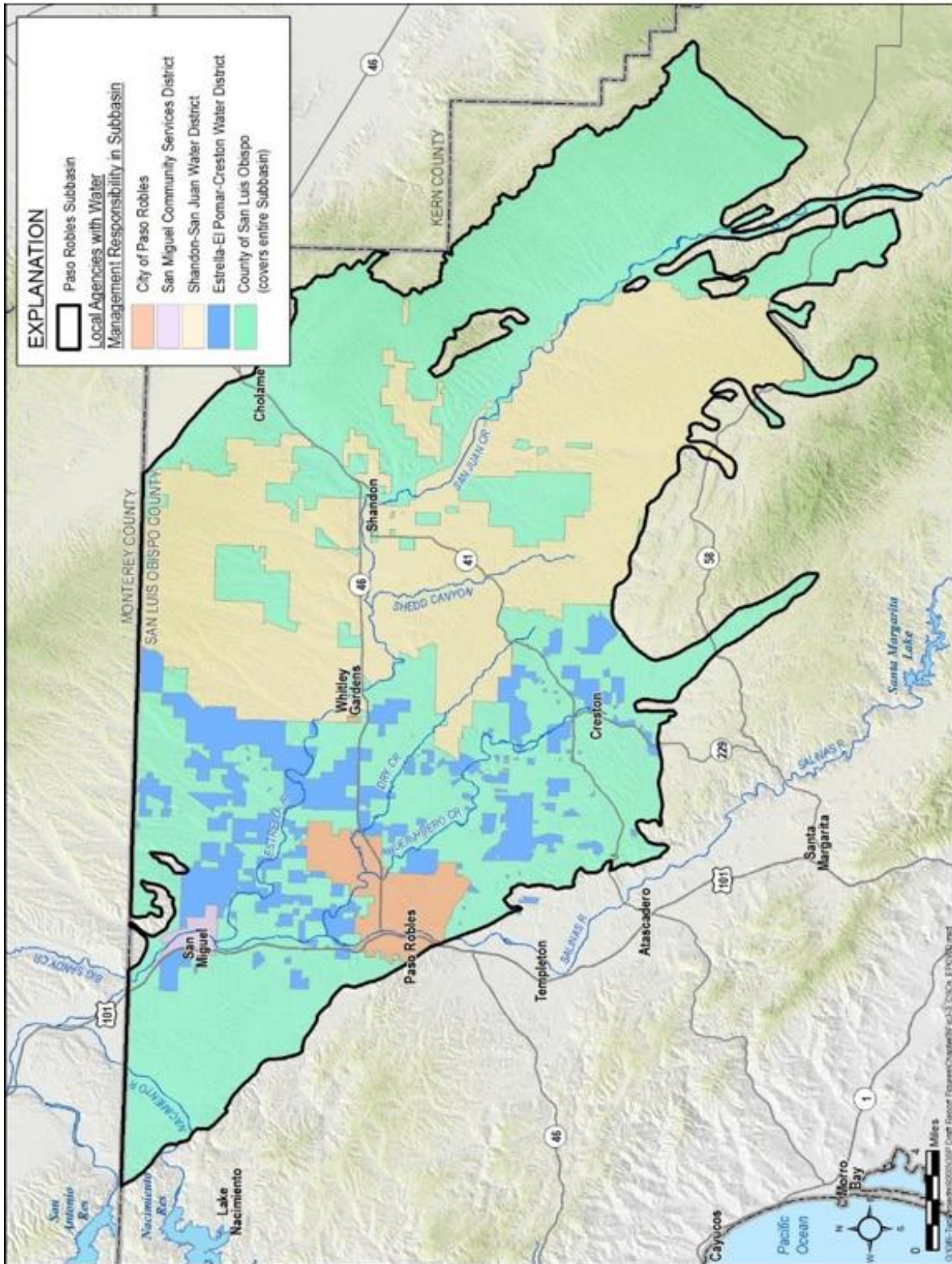
- (a) For purposes of subdivision (b) of Section 933, as to each grand jury finding, the responding person or entity shall indicate one of the following:
 - (1) The respondent agrees with the finding.
 - (2) The respondent disagrees wholly or partially with the finding; in which case the response shall specify the portion of the finding that is disputed and shall include an explanation of the reasons, therefore.
- (b) For purposes of subdivision (b) of Section 933, as to each grand jury recommendation, the responding person or entity shall report one of the following actions:
 - (1) The recommendation has been implemented, with a summary regarding the implemented action.
 - (2) The recommendation has not yet been implemented, but will be implemented in the future, with a timeframe for implementation.
 - (3) The recommendation requires further analysis, with an explanation and the scope and parameters of an analysis or study, and a timeframe for the matter to be prepared for discussion by the officer or head of the agency or department being investigated or reviewed, including the governing body of the public agency when applicable. This timeframe shall not exceed six months from the date of publication of the grand jury report.
 - (4) The recommendation will not be implemented because it is not warranted or is not reasonable, with an explanation, therefore.

Presiding Judge	Grand Jury
Presiding Judge Craig van Rooyen Superior Court of California 1035 Palm Street Room 355 San Luis Obispo, CA 93408	San Luis Obispo County Grand Jury P.O. Box 4910 San Luis Obispo, CA 93403

APPENDICES

- Appendix A - Map of Basin and GSAs with Estrella El Pomar Creston Water District Boundary
- Appendix B - Summary of MILR Program
- Appendix C - GSP Timeline

APPENDIX A – GSA map with Estrella El Pomar Creston Water District



(Source: Figure 3-3 Paso Basin GSP page 3-6)

APPENDIX B – Multi-Benefit Irrigated Land Repurposing (MILR) Program

PROGRAM ELEMENTS

- Establish Program Description, Rules and Regulations
- Define Program Administration and Management Entity (Oversight/Authority under GSAs, JPA or third-party contractor)
- Farming Unit Registration
- Define Consumed Groundwater Use Measurement
- Groundwater Usage Fees
- Groundwater Accounting, Data Management, Reporting
- Financial Accounting, Billing, and Auditing
- Enforcement and Penalties
- Link to Mandatory Pumping Reduction/Allocation Program (if required)
- Nexus to Land Use Ordinances (Agricultural Offset Ordinance/Planting Ordinance)

PROGRAM EXAMPLES

- Creation or restoration of habitat (Wetlands, upland, riparian and pollinator habitats)
- Creation of multi-benefit recharge areas
- Conservation of irrigated land to dryland farming or non-irrigated rangeland
- Planting cover crops or conservation cover
- Facilitation of renewable energy projects that have an overall net GHG reduction
- Creation of parks or community recreation areas
- Incentive payments to landowners to implement multi-benefit projects that create public benefit (for at least ten years, with priority for small and medium farmers and ranchers)
- Land acquisitions to facilitate land repurposing and protect repurposed land uses
- Voluntary land transfers to qualified public entities to facilitate land repurposing and protect repurposed land uses
- Easement acquisitions to facilitate land repurposing and protect repurposing land uses

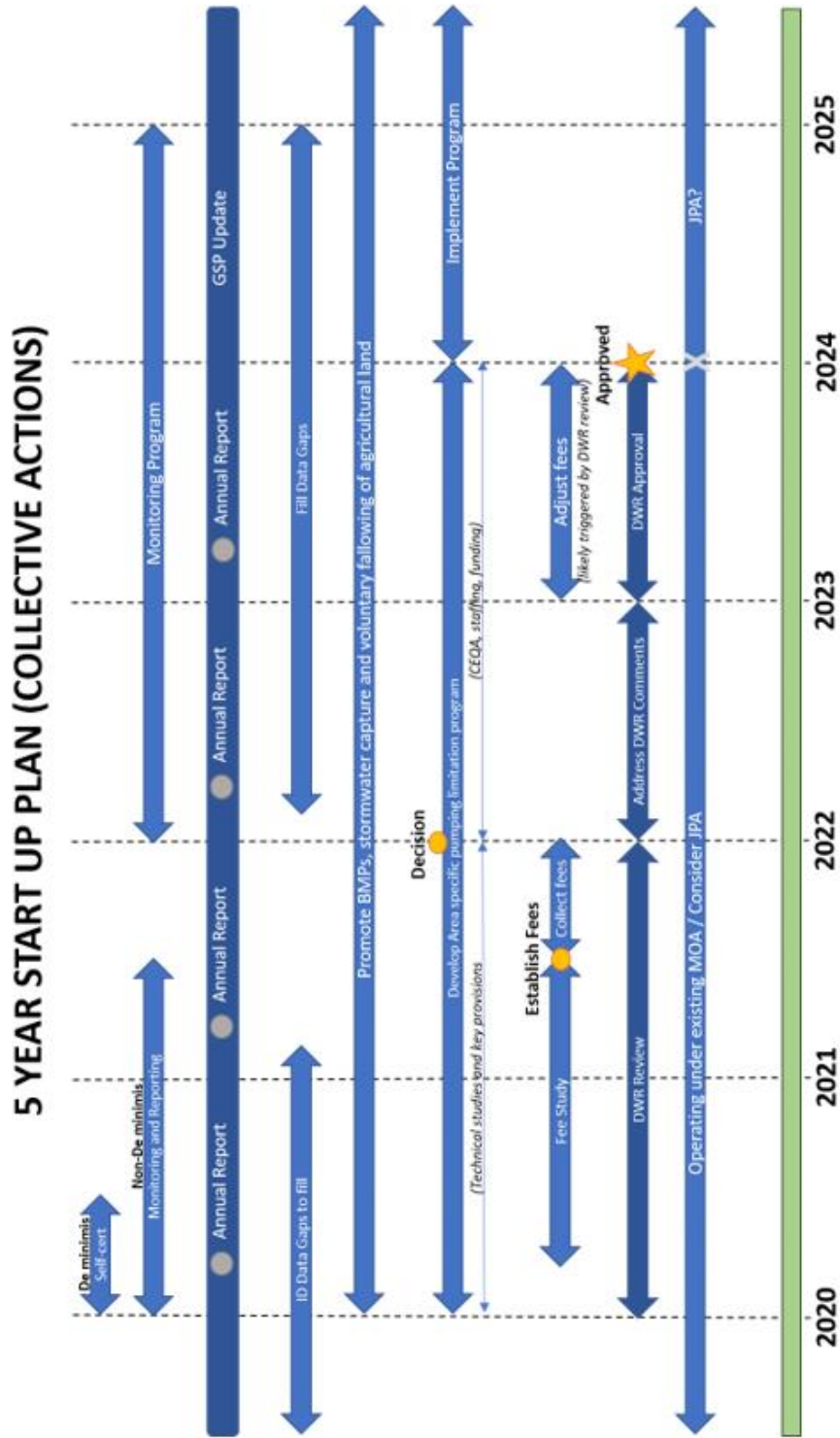
DESIRED OUTCOMES

- Reduced groundwater use
- Increased groundwater recharge
- Improved base flows in rivers and streams
- Conservation of land to less intensive water uses while maintaining natural and working lands
- Creation and/or restoration of wildlife and pollinator habitat and/or migratory resources
- Improved water quality
- Prioritization of lands to be enrolled to maximize benefit to the groundwater basin
- Increased community outreach, involvement, and education
- Mitigation of groundwater conditions in the basin that pose risks to water adequacy and quality for domestic well users (High Priority)

- Protection of areas where interconnected surface water and groundwater systems and groundwater dependent ecosystems exist
- SGMA Compliance
- Long-term groundwater basin sustainability.

(Source: October 26, 2022 Paso Basin Coordinating Committee Agenda Package pages 22,23, 26)

Appendix C – GSP Timeline



JPA: Joint Powers Authority

(Source: Figure 10-1; Paso Basin GSP page 10-2)